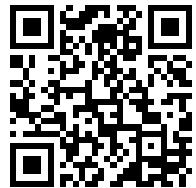

This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

Google™ books

<https://books.google.com>

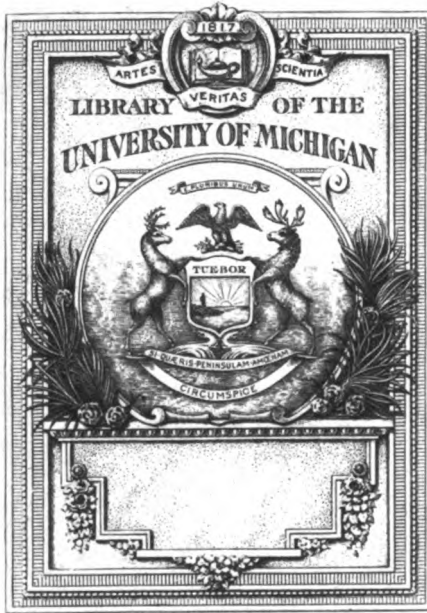




The International standard

International Institute for Preserving and
Perfecting Weights and Measures

Digitized by Google



20
81
.I62



M. L'ABBÉ F. MOIGNO,

CANON OF ST. DENIS,

**Editor of the Journal "Cosmos Les Mondes." Author of the 'Splendors
of the Faith,' and other works.**

24855-

THE
INTERNATIONAL
STANDARD

A MAGAZINE

DEVOTED TO THE DISCUSSION AND DISSEMINATION OF THE WISDOM CONTAINED
IN THE
GREAT PYRAMID OF JEEZEH IN EGYPT

VOLUME II.

ISSUED BIMONTHLY. PRICE 35 CENTS

TERMS OF SUBSCRIPTION AND MEMBERSHIP, \$2.00 PER ANNUM IN ADVANCE.

The International Institute as a body is not responsible for the facts or the opinions put forth by any of the writers for this Magazine.

Until the articles of incorporation are taken out, this Magazine is published on the responsibility of Charles Latimer, therefore neither the members individually nor the Society as a body assume any liability.

All in favor of advancing truths most absolute, as portrayed in the revelations of the Great Pyramid of Egypt, and of the success of the Society in preserving inviolate the Anglo-Saxon weights and measures, will kindly communicate with the President, by whom also subscriptions, donations and communications will be gratefully received.

THE INTERNATIONAL INSTITUTE
FOR PRESERVING AND PERFECTING THE ANGLO-SAXON WEIGHTS AND MEASURES
CLEVELAND: 64 EUCLID AVENUE

The International Standard.

VOLUME II.

CONTENTS.

	PAGE.
ALTAR AND PILLAR TO JEHOVAH, THE <i>Dr. J. W. Redfield</i> (14-104-208-324-583)	79
A FEW WORDS FROM ABBE MOIGNO,.....	402
ANALOGUES,..... <i>Jacob M. Clark, C. E.</i>	409
AN OPEN LETTER TO THE PRESIDENT OF THE UNITED STATES,.....	409
BIOGRAPHY OF REV. SIR HENRY BOURCHIER WREY,.....	170
..... <i>Prof. C. Piazzzi Smyth.</i>	
CRITICISM OF MR. N. B. WOOD'S SYSTEM OF WEIGHTS AND MEASURES,.....	129
..... <i>Edwin R. Graham.</i>	
CORRELATION OF ANGLO-SAXON MEASURES,..... <i>Rev. H. G. Wood.</i>	361
CONSTANTS,.....	414
CRITICISM ON MR. PETRIE'S PYRAMID MEASURES,.....	516
..... <i>J. Ralston Skinner.</i>	
CHARLES CASEY'S SOLUTION OF THE MEANING OF THE UN-INTERPRETED SIGN,.....	548
CHEOPS AND JEEZEH,..... <i>J. K. Hornish.</i>	602
COL. CHESTER'S REPORT AND ADDRESS,.....	607
CIRCULAR TO THE COMMITTEE ON WEIGHTS AND MEASURES	644
DOW'S NEW FORMULA,..... <i>Samuel Beswick, C. E.</i>	372
DEATH OF THE ABBE F. MOIGNO,.....	379
EXTRACT FROM A PAPER BY JACOB M. CLARK,.....	377
FIRST MERIDIAN AND THE METRIC SYSTEM, THE,.....	58
..... <i>Abbe F. Moigno.</i>	
FLINDERS' PETRIE'S WORK AT THE GREAT PYRAMID,.....	367
..... <i>J. Ralston Skinner.</i>	
GEODESIC THEORY, THE,..... <i>Lieut. C. A. L. Totten.</i>	31
GENEALOGICAL STONES IN THE GREAT PYRAMID,.....	68
..... <i>Rev. H. G. Wood.</i>	
GREAT PYRAMID A PROPHETICAL RECORD? IS THE,.....	78
..... <i>Joseph Baxendell, F. R. A. S.</i>	

Contents.

GLEANINGS FROM PETRIE'S NEW BOOK,.....	<i>J. H. Dow.</i>	222
GLIMPSES OF OUR CELTIC ANCESTORS,.....	<i>Edwin Wilmshurst.</i>	297-407
GREAT PYRAMID AN EMBLEM OF THE UNIVERSE, THE.....	<i>Asahel Abbott.</i>	315
HISTORY OF REDEMPTION, THE.....	<i>S. H. Reeve.</i>	116
HISTORY OF THE GREAT PYRAMID,.....	<i>Rev. Jesse H. Jones.</i>	157
HISTORY OF THE DECIMAL SYSTEM IN FRANCE,.....		280
INTERESTING COMMUNICATIONS,.....		39
IDENTITY OF THE ANGLO-SAXONS WITH THE LOST TEN TRIBES,.....	<i>Rev. E. P. Ingersoll.</i>	459
INTERNATIONAL CONGRESS TO DETERMINE A PRIME MERIDIAN, THE.....		558
LOGIC OF THE PYRAMID, THE.....	<i>Capt. R. Kelso Carter.</i>	168
LONG OR SHORT FRACTIONS FOR GREAT NATIONAL STANDARDS,.....	<i>Prof. C. Piazzi Smyth.</i>	219
LIVES WHICH LIVE,.....		277
MOON'S MEAN PERIOD, THE.....	<i>Joseph Baxendell, F. R., A. S.</i>	60
MATHEMATICAL ACCURACY,.....	<i>Rev. H. G. Wood.</i>	152
MANUFACTURE AND PROPORTIONING OF WEIGHTS AND MEASURES,.....	<i>Lieut. C. A. L. Totten.</i>	155
METROLOGISTS OF THE INSTITUTE,.....	<i>Geo. C. Davies.</i>	346
MEASURE AND THE POWER, THE.....	<i>J. Ralston Skinner.</i>	357
METRIC SYSTEM PROPOSED BY JACOB M. CLARK.....		400
METRIC SYSTEM, THE.....	<i>Coleman Sellers.</i>	543
METROLOGY,.....	<i>Rev. H. G. Wood.</i>	594
NEW MEASURES OF THE GREAT PYRAMID BY A NEW MEASURER,.....	<i>Prof. C. Piazzi Smyth.</i>	63-163
NATIONAL MOTTO, OUR.....	<i>Emily Damon.</i>	338
OBJECT AND BELIEF OF THE INTERNATIONAL INSTITUTE.....		614
PYRAMID BASE, THE.....	<i>Samuel Beswick, C. E.</i>	132-254-354-507
PYRAMID NOTES FROM THE ANTIPODES,.....	<i>R. Ballard, R. S. C. E.</i>	145
PYRAMID INCH? WHAT IS THE.....	<i>Charles Latimer.</i>	231
PYRAMID INCH, PROF. SMYTH'S.....	<i>Rev. H. G. Wood.</i>	242
PYRAMID STUDIES,.....	<i>Lieut. C. A. L. Totten.</i>	349
PILLAR OF WITNESS, THE.....	<i>Mrs. Angie Damon.</i>	141
PROVE ALL THINGS,.....	<i>J. H. Dow.</i>	154
PERIMETER OF THE SIDE WALLS OF THE KING'S CHAMBER, THE.....	<i>J. H. Dow.</i>	240
PYRAMIDAL FREEMASONRY,.....	<i>Thomas Holland.</i>	293
PRIME MERIDIAN TIME,.....	<i>Rev. H. G. Wood.</i>	273
PROF. BARNARD'S BOOK,.....	<i>Joseph Baxendell, F. R. A. S.</i>	375
PRESIDENT BARNARD'S ATTACK ON THE GREAT PYRAMID METROLOGY.....	<i>C. Piazzi Smyth.</i>	445
PI,.....	<i>Rev. H. G. Wood.</i>	554
PREFACE TO LIEUT. TOTTEN'S BOOK, "AN IMPORTANT QUESTION,".....		555
PYRAMIDS AND TEMPLES OF GIZEH, A REVIEW.....	<i>S. Beswick, C. E.</i>	43
RESEARCHES FOR THE ARMY OF PHARAOH IN THE RED SEA.....	<i>Abbe F. Moigno.</i>	62
RISE OF THE ANTIPODES, THE.....	<i>C. Piazzi Smyth, F. R. A. S.</i>	76
REFORM OF THE CALENDAR, THE.....	<i>F. Hess.</i>	209

Contents.

REFLECTIONS CONCERNING THE SO-CALLED PI VALUE,	268
..... <i>Theo. Faber.</i>	
ROBERT MENZIES, THE LATE.....	613
SUGGESTIVE NOTES ON PYRAMID MEASURES OF MR. PETRIE	
AND OTHERS,..... <i>J. Ralston Skinner.</i>	243
SPHINX, THE..... <i>E. Bedell Benjamin.</i>	483
TESTIMONY OF THE SOCKETS AND AIR CHANNELS,.....	
..... <i>Rev. H. G. Wood.</i>	228
UNVEILING OF ISIS, THE..... <i>Charles Latimer, C. E.,</i> 3-95-381-535-567	
UNIT OF MEASURE, WHAT SHALL BE THE..... <i>J. H. Dow.</i>	494
WILLIAM OSBURN, THE EGYPTOLOGIST OF LEEDS.....	268

LETTERS.

ABBOTT, PROFESSOR A.....	82-624
ALLEN, W. F.....	430
ARNOLD, S. G.....	299
BIDEN, L.....	179
BROUGHTON, L. D.....	416
BAXENDELL, JOSEPH.....	424-560
BESWICK, S.....	560-620
COX, W. C.....	83
CLARK, JACOB M.....	306-627
COOKE, REV. W.....	425
DAMPIER, J. L.....	304-626
DURKEE, JAMES M.....	626
EPSTEIN, DR. E. M.....	428-624
FRISBEE, E. C.....	80
FABER, THEO.....	81
GRIPI, THEO.....	81
GODFREY, MRS. H. E.....	305
HORNISH, J. K.....	174
HOLLAND, T.....	301
HASKELL, L. F.....	424
HESS, F.....	421-618
INGERSOLL, REV. E. P.....	425-427-625
MOIGNO, L'ABBE F.....	80
MACKAY, REV. ALEX.....	426-626
PERRY, REV. JEVONS, J. M.....	303-426
PLUMPTRE, MRS. W. A.....	425
SMYTH, PROF. C. PIAZZI.....	176-178-304-420-423-622
SIMPSON, JAMES.....	620-623-629
STOCK, ARCHDEACON.....	628
SKINNER, J. R.....	180-422
TOTTEN, LT. C. A. L.....	172-306-628
UPJOHN, REV. J. A.....	302-625
WOOD, REV. H. G.....	175-622
WING, J. N.....	304
WINTER, F. A. R.....	418-618
SYNOPSIS OF LETTERS.....	83-181

PROCEEDINGS OF THE INTERNATIONAL INSTITUTE, 85-184-307-

Contents.

EDITORIAL NOTES,.....	89-193-313-436-565-636
REVIEWS,	91-193-313-439-566-637
TREASURER'S REPORT,.....	635
NOTES AND QUERIES,.....	92-195-441-643

PORTRAITS.

M. L'ABBE F. MOIGNO, LATE CANON OF ST. DENIS.
THE REV. SIR HENRY BOURCHIER WREY.
WILLIAM OSBURN.
ROBERT MENZIES.
CHARLES CASEY, C. E.

THE
INTERNATIONAL
STANDARD

A MAGAZINE

DEVOTED TO THE DISCUSSION AND DISSEMINATION OF THE WISDOM CONTAINED
IN THE
GREAT PYRAMID OF JEEZEH IN EGYPT

MARCH, 1884.

ISSUED BIMONTHLY. PRICE 36 CENTS

TERMS OF SUBSCRIPTION AND MEMBERSHIP, \$2.00 PER ANNUM IN ADVANCE

The International Institute as a body is not responsible for the facts or the opinions put forth by any of the writers for this Magazine.

All in favor of advancing truths most absolute, as portrayed in the revelations of the Great Pyramid of Egypt, and of the success of the Society in preserving inviolate the Anglo-Saxon weights and measures, will kindly communicate with the President, by whom also subscriptions, donations and communications will be gratefully received.

THE INTERNATIONAL INSTITUTE

FOR PRESERVING AND PERFECTING THE ANGLO-SAXON WEIGHTS AND MEASURES

CLEVELAND: 30 EUCLID AVENUE

BOSTON: 345 TREMONT STREET

INTERNATIONAL INSTITUTE FOR PRESERVING AND PERFECTING WEIGHTS AND MEASURES.

FOUNDED NOVEMBER 8, 1879.

CHARLES LATIMER, President, Cleveland, Ohio.
J. S. F. HUDDLESTON, Vice President, Boston, Mass.
LUCIAN I. BISBEE, Secretary, Boston, Mass.
G. R. HARDY, Treasurer, Springfield, Mass.

OHIO AUXILIARY SOCIETY.

CHARLES LATIMER, President. **WM. H. MCCURDY**, Treasurer.
A. M. SEARLES, Vice President. **G. W. CROSSETTE**, Cor. Secretary.
MARY B. SANFORD, Recording Secretary.

PUBLISHING COMMITTEE.

CHARLES LATIMER, C. E. } Editors. **J. H. DOW**. } **J. W. REDFIELD**, M. D.
H. C. THOMPSON, } **W. W. WILLIAMS**. } **J. A. BIDWELL**.
MRS. A. M. SEARLES. } **MARY B. SANFORD**.

COMMITTEE ON STANDARD TIME.

REV. H. G. WOOD, Chairman of Committee, Sharon, Pennsylvania.
PROF. PIAZZI SMYTH, Astronomer Royal for Scotland, F. R. A. S., F. R. S. E., etc.,
Edinburgh.
M. L'ABBE F. MOIGNO, Canon of St. Denis, Paris, France, editor of *Cosmos Les Mondes*,
and author of "The Splendors of the Faith."
SANDFORD FLEMING, C. M. G., M. Inst. C. E., F. G. S., F. R. G. S., Ottawa, Canada.
WILLIAM H. SEARLES, C. E., Elyria, O.
JACOB M. CLARK, M. Am. Soc. C. E., New York.
PROF. STOCKWELL, Astronomer, Cleveland, Ohio.
CHARLES LATIMER, C. E., Cleveland, Ohio.

WILLIAM W. WILLIAMS, PRINTER,
145 and 147 St. Clair Street, Cleveland, Ohio.

THE INTERNATIONAL STANDARD.

MARCH, 1884.

THE UNVEILING OF ISIS.

III.

The Roman hierarchy, sustained by the most brilliant minds of that or any other age, still sought by a mighty effort to bring the whole race under subjection. Whilst the Princes of the Sun, Charles V., Emperor of the Romans, the noble but politic Francis I, of France, and the gorgeous defender of the Faith, Henry VIII, of England, each for his own selfish ends serving the Triple Crown, were struggling for mastery, a gigantic power, under the banner of Solomon the Magnificent, invaded Europe with a great host, laid siege to the stronghold of Rhodes, and forced those brave knights who watched and guarded the outposts of Christianity against the invasion of the Moslem. That nation, which three centuries before had been attacked with holy zeal by Crusaders, now returned the charge, and with a mighty host attempted to plant their banner as the symbol of a universal faith. But as the Moors had been driven back from Spain a century before, so now were the Saracens crushed and defeated and finally reduced to the secondary position they still hold. The moon is still under the foot of Christendom.

Under the control of the three great sovereigns, Charles, Francis and Henry, Europe had emerged from the oppressive weight of the feudal system, and now bade fair to evolve from it a magnificent empire, rivalling in grandeur that of the Cæsars. The culminating effort of Rome came under Philip II, whose avowed aim was the establishment of one government, dominating not only the old world, but bringing India and the Americas into subjection to one great political and spiritual head. In this great but direful aim there came to his aid a child of his own race, transplanted to that island, which, partly disenthralled, made a step forward in the path of progress. The wife of Philip, Mary Tudor—a dark-souled but loving woman, aided by a wily plotter from the Italian court, where subtlety and address in negotiations had become a science—turned back upon all that her father had done and led by a will o' the wisp, a phantom of love, became the faithful ally of her husband. For this only, Philip gave her the title of wife and the headless trunks of statesmen, and the ashes of martyrs attested the fury of her disappointed passion.

The death of Mary of England and the wreck of the Armada checked Philip's "vaulting ambition." Let us not exult over the enemies of peace. God's wrath overtook them. Listen to them as the poet expresses their gloomy griefs—a truthful transcript of the thoughts of Mary's counsellor, Cardinal Pole, legate of the Triple Crown :

"Our altar is a mound of dead men's clay,
Dug from the grave that yawns for us beyond;
And there is one death stands behind the groom,
And there is one death stands behind the bride.
Alas! Our bridesmaids are not lovely! Disappointment,
Ingratitude, Injustice, Evil Tongue—Labor in Vain!"
And what came of all this?
Ashes! Ashes!! Ashes!!! Unburied Ashes!

Amid the crackling of flames and the cries of martyrs whose blood was shed for the testimony of the word, one cried out: "Into Thy hands, O Lord, do I commit my spirit; thou hast redeemed me, oh most good and faithful God. I have never preached any doctrine of an evil tendency, and what I taught with my lips, I seal with my blood." Another cried aloud: "We shall this day light such a candle by God's grace in Eng-

land as shall never be put out," and washing his hands in the flames which licked up his life blood, he said in a clear voice: "Oh, Father of Heaven, receive my soul. How long, oh Lord, Holy and True, dost thou not judge and avenge our blood on them that dwell on the earth?"

" The unslain shadows of the martyrs slain,
Rise on their fields of old heart-ache and pain,
To fight their battles o'er and o'er again.
Those ashes scattered on the trackless shore,
Shall rise again in power to die no more ;
Half buried hands, still thrust up through the sod,
From fields of carnage, prayerfully to God,
Will grasp the weapons of immortal war.
Freed spirits make their conquering battle-car
Of human hearts ; they did but hold their breath
To smite unheard in their dark cloud of death.
They work for Freedom still, though out of sight :
They are torch-bearers in your mortal night.
The tyrants may destroy the body ; drench
The life out with the blood, but can not quench
The spirit, nor put out the lofty light
O' the stars that in their courses "gainst them fight."

" Wide as the wings of Sleep by night are spread
Are Freedom's exiles scattered, and her dead
Have lain their bodies down 'neath God's great dome.
But every banished spirit hurries home
Soon as the free, long-fettered life upsprings
Awake one day on mighty warrior-wings.
Each soul, let out, fights with the strength of seven,
Under God's shield, and on the side of Heaven.

The vengeance of God was indeed visited, but not vengeance as man understands it, nor as man would visit it, the vengeance of a merciful Creator, who overturned the vast fabric reared by despotism by providing an asylum for his people, who, under his guidance, should establish a government never to be destroyed ; whose influence should grind to powder, like the dust of a summer threshing floor, those who oppressed it.

To this asylum came from mountain fastnesses, from caves, from all the hiding-places to which the malice of their persecutors had driven them, those who had been preserved until the highway was opened.

In this they followed the literal direction of Luther, "When you are oppressed and persecuted, flee unto other lands."

A new era began at the death of Mary. When the depu

tation came to announce to Elizabeth that she was queen, with deep devotional feeling, she cried out, "This is the Lord's doing, and it is marvelous in our eyes."

Elizabeth was the antitype of Isabella. The whole power of Rome was brought against her to overwhelm her. The grand Armada was organized and sent to overthrow her. It was on St. Michael's day, as she was eating a goose, that the destruction of the mighty flotilla with all on board was announced to her.

With Brewster as a leader, with the blessings and prayers of the venerable John Robinson and the brethren, and the shouts and acclamations of the hospitable people of Holland, the persecuted fled in the Mayflower, saying, "Let us seek God, a right way for us and for our children and for all our substance." In the cabin of the Mayflower humanity recovered its rights and instituted a government on the basis of equal laws for the general good.

This was the first realization of the prophetic symbol of a church fleeing upon the wings of a great eagle into the wilderness.

Many years ago, one morning at early dawn, on board a gallant ship, I was aroused by an order from my honored captain to come on deck that I might, with others of the ship's company, look upon a spectacle rarely seen on account of mist and storm. Jutting out into a tempestuous sea rose Cape Horn, an enormous cliff of ice-bound rock, thousands of feet high, black, grim and scarred as with the battles of ages. Myriads of screaming sea-birds hovered about it, mingling their piercing cries with the ceaseless roar of two mighty oceans. Safely sheltered on a splendid ship, we viewed the awe-inspiring scene in safety. No monster of persecution behind us forced us to land on an inhospitable shore; but in all security we looked upward to the flag that floated above us, and thanked God that we had a home.

In what contrast to our situation was that of the great souls on the Mayflower, on that memorable 20th of December, 266 years ago. With what thrills of alternate hopes and fears was

the "Promised Land" welcomed. A barren rock, "the corner stone of a nation," was their door-step to a world unknown."

"The ocean eagle soared
From its nest by the white wave's foam,
And the rocking pines of the forest roared ;
This was their welcome home.

"Aye, call it holy ground,
The spot where first they trod ;
They've left unstained what there they found,
Freedom to worship God !

We cannot trace in detail the history of discovery, the peopling of the country, the struggles and the triumphs of the new world. The tale of alternate despair and hope would require volumes, not pages.

The wondrous story of our country's evolution is vividly described by one of our greatest poets :

THE PILGRIM'S VISION.

"Come hither, God-be-Glorified,
And sit upon my knee,
Behold the dream unfolding
Whereof I spake to thee.
By the winter's hearth in Leydens
And on the stormy sea ;
True is the dream's beginning—
So may its ending be.

I saw in the naked forest
Our scattered remnant cast
A screen of shivering branches
Between them and the blast ;
The snow was falling around them,
The dying fell so fast,
I looked to see them perish,
When, lo, the vision passed.

Again mine eyes were opened ;
The feeble had waxed strong,
The babes had grown to sturdy men,
The remnant was a throng ;
By shadowed lake and winding stream,
And all the shore along,
The howling demons quaked to hear,
The Christian's Godly song.

They slept, the village fathers,
By river, lake and shore,
When far adown the steep of time,
The vision rose once more ;

The International Standard.

I saw along the winter snow
 A spectral column pour,
 And high above their broken ranks
 A tattered flag they bore.

Their leader rode before them,
 Of bearing calm and high,
 The light of heaven's own kindling
 Throned in his awful eye.
 These were a nation's champions
 Her dread appeal to try.
 "God for the right," I faltered,
 And lo, the train passed by.

A crash, as when some swollen cloud
 Cracks o'er the tangled trees !
 With side to side, and spar to spar,
 Whose smoking decks are these ?
 I know St. George's blood-red cross;
 Thou mistress of the seas—
 But what is she whose streaming bars
 Roll out before the breeze ?

Ah, well, her iron ribs are knit,
 Whose thunders strive to quell
 The bellowing throats, the blazing lips
 That pealed the Armada's knell !
 The mist was cleared—a wreath of stars
 Rose o'er the crimsoned swell,
 And, wavering from its haughty peak,
 The cross of England fell.

Once more the strife is ended,
 The solemn issue tried.
 The Lord of Hosts—His mighty arm
 Has helped our Israel's side;
 Grey stone and grassy hillock
 Tell where our martyrs died.
 But peaceful smiles the harvest,
 And stainless flows the tide.

O, trembling faith, though dark the morn,
A heavenly torch is thine;
 While feebler races melt away,
 And paler orbs decline,
 Still shall the *fiery pillar's* ray
 Along the pathway shine,
 To light the chosen tribes that sought
 This Western Palestine.

I see the living tide roll on;
 It crowns with flaming towers
 The icy capes of Labrador,
 The Spaniard's land of flowers.

It streams beyond the splintered ridge
That parts the Northern showers.
From eastern rock to sunset wave
The continent is ours.

Yea, when the frowning bulwarks
That guard this holy strand
Have sunk beneath the trampling surge
In beds of sparkling sand,
While in the waste of Ocean
One *hoary rock* shall stand,
Be this its latest legend,
Here was the Pilgrims' land.

But while these brave and fearless men were laying the foundations of a race of great promise in the new world, how fared they of the old? Whilst nothing but the wide ocean and the savage deserts could protect these poor pilgrims from the fury of their oppressors, great darkness returned and overshadowed their native land. The pillory had become the bloody scene of human agony, and mutilation was an ordinary punishment. Great numbers were imprisoned and scourged; in some cases their noses were slit, their ears were cut off, their cheeks were marked with a red hot brand; the dungeon, the pillory and the scaffold were but stages in the progress of civil liberty towards its triumph; the lash, the shears, and the glowing iron could not destroy principles which were rooted in the soul, and which danger made it glorious to profess. Poor Burton said, as his ears were cropped off, "this is too hot to last."

As if aghast at the gaping wounds of an oppressed and martyred Christianity, nature, stirred to the profoundest depths, wrung from the very enemies of peace the boon which was to heal its deadly wounds—the New World—to whose shores, as doves to the windows, fled the children of persecution.

But to allow the oppressed the opportunity to escape was now deemed too magnanimous for that tyrant age, and a proclamation went forth denying the accused the refuge of the wilderness. But the day of reckoning had come, and a change to king and priest was at last at hand. The blue blanket of the Covenanters of Scotland was raised, and upon each pennon "For Christ, Crown and Covenant." Persecution had added to the strength of the persecuted, and Oliver Cromwell, said to

have been prevented from embarking by the henchmen of the king, now turned, like a lion, to be that king's destruction. At the head of his invincible Ironsides he took the field, captured the king and took off his head.

The colonists of New England wrote to Cromwell and said: "We believe that you are fighting the battles of the Lord," and as they pondered upon the mighty struggle then in progress, so moved were the hearts of men that they believed that the second coming of Christ was at hand, and evidences of this belief pervaded the age.

Amongst the mystic legends of the days when the Scriptures were hidden away, two have come to us wonderfully fitted to our history—those of St. George and St. Michael.

St. George was the great military saint of the Crusades. Once, in far remote times, there was a great city whose inhabitants were in mortal terror of a fierce dragon that lived near its limits. The monster had already devoured flocks and herds, and in order to appease him, the people were called upon to send out two sheep daily, until all were gone. Then, to prevent him from approaching the city, two children were chosen by lot to be sent to the insatiable beast. Soon it came to the lot of the king's daughter. "The king's daughter is all glorious within, her clothing is of wrought gold," saith the Psalmist. As she walked to the sacrifice, weeping and with downcast eyes, St. George appeared, and seeing her sorrow, asked the cause. When the princess had told him, he said: "Fear not, I will deliver you, through the power of Jesus Christ." Just then the dragon approached, and although the princess entreated St. George to fly, he made the sign of the cross and rushed to the combat. The struggle was terrible, but the saint was victorious. He transfixing the dragon with his lance; then taking the girdle of the princess, he bound the monster, and giving the girdle into her hand, they went onward to the city. The people were filled with fright, but St. George cried out: "Fear nothing, only believe in God, through whose might I have conquered this adversary, and be baptized, and I will destroy him before your eyes." And that day were twenty thousand people baptized. After this, St. George slew the dragon and cut off

his head. Then the king gave him great treasures, but he gave all to the poor, keeping absolutely nothing for himself, and he went on his way to Palestine.

At the rise of Cromwell, the St. George of the Ages, the forerunner of our Michael, a mighty event took place. The United Colonies of New England arose September 7th, 1643, and in England, simultaneously—September 17th, 1643—was passed by Parliament the famous Covenant, and on September 22 both Houses of Parliament, with Cromwell at their head, marched to St. Margaret's Church and swore to defend Christ, Crown and Covenant.

Is there no prophecy in the words addressed by Cromwell to that Parliament, which the king's scoffers called "Barebones Parliament?"

On that typical 4th of July, 1653, "in Psalm lxxviii," said he, "there are prophecies that God will bring his people again from the depths of the sea, as once he did Israel through the Red Sea. And it may be that some think God will bring the children of Israel home to their station from the isles of the sea and answer their expectations as from the depth of the sea. But at all events, sure I am, when the Lord shall set up the glory of the Gospel Church, it shall be as the gathering of peoples *as out of deep waters, out of the multitude of waters*, such are his people drawn out of the multitude of the nations and peoples of this world—and truly that Psalm is very glorious in many parts of it—when he gathers them. *Great was the company of them that publish the word.* And why shall we be afraid to say or think that this may be the door to usher in the things that God has promised, which have been prophecies of which he has set the hearts of the people to wait for and expect."

"Westward the course of empire takes its way ;
The four first acts already past,
The fifth shall end the drama with the day ;
Time's noblest offspring is the last."

Not in the old world was the example of liberty and republicanism to be set up. The kingly power was restored at Cromwell's death, and the old world must look to the new to learn the problem of LIBERTY. And who was the instrument

chosen to do this grand errand in the world? Father of his country, the patriot, the warrior, the benign and loving ruler—George Washington.

Far back in the centuries past, in the time of that great William, called conqueror, in the bishopric of Durham, there was a knight of noble character—one of those, perchance, who had drawn his sword in the holy cause of the Crusaders—to drive back the infidel and rescue the holy land. He was represented in full armor, a sword in the right hand, and the arms of the see—the cross—in the other. This was William de Wessyngton, a progenitor of George Washington, who, descended from a noble line of an honorable and distinguished race, was a worthy champion of the cause of humanity.

Still further back in the past, amongst the instruments especially raised up by God for the restoration of the Israelites from their seventy years' captivity, was one whose mission was to release Israel and rebuild the walls of Jerusalem and her temple. Two hundred years before his coming, the prophet thus reveals him: "Thus, saith the Lord, thy Redeemer, and He that formed thee from the womb, I am the Lord that maketh all things, that stretcheth forth the heavens above, that spreadeth abroad the earth by myself; that saith of Cyrus, he is my shepherd and shall perform all my pleasure, even saying to Jerusalem, 'thou shalt be built, and to the temple thy foundation shall be laid.' Thus saith the Lord to his anointed, to Cyrus, whose right hand I have holden to subdue nations before him; and I will loose the loins of kings, to open before him the two-leaved gates and the gates shall not be shut; I will go before thee and make the crooked places straight; I will break in pieces the gates of brass and cut in sunder the bars of iron; for Jacob my servant's sake, and Israel, mine elect, I have even called thee by thy name. I have surnamed thee, though thou hast not known me—that thou mayest know that I, the Lord, which call thee by thy name, am the God of Israel."

We see that God, through his prophet, announced Cyrus by name two hundred years before he came to be the deliverer of the Israelites from seventy years captivity in the taking of Babylon. Palestine, with its narrowed limits and its small

band of chosen people, may not be esteemed of higher value than this land, this modern Palestine, with its millions of souls brought here through much tribulation. Can it astonish us, then to find him also called by name in the words of the prophets, who, peerless among men, in ancient or modern times, was to become the great political captain of our salvation?

The Israelites vainly looked for their Messiah during eighteen centuries. In later years they seem to have lost faith. Twenty years ago, in a moment of inspiration at the contemplation of the freedom of our great land—a haven of rest for that persecuted people—Rabbi Wise, one of their most learned and enlightened teachers, published an address to them in the columns of *The Israelite*, of which he is the editor. In this address will be found these remarkable words, “My friends, you need not look beyond the Messiahship of George Washington.”

And to what man, ancient or modern, can this name, with its glorious attributes, be more fitly applied—“The savior of his country, the savior of a world.”

For “There was war in heaven—Michael and his angels fought against the dragon, and the dragon fought and his angels, and prevailed not, neither was their place found any more in heaven.”

St. Michael, God-like, synonymous with St. George, is always represented as young and beautiful. As patron of the church militant, he stands with mild, majestic mien; his only attributes are shield and lance. As conqueror of Satan he stands in armor with his foot on the evil one, who is half human and like a dragon in shape.

“ The defender of his country, the founder of liberty,
The friend of man ;
History and tradition are explored in vain
For a parallel to his character.
In the annals of modern greatness
He stands alone,
And the noblest names of antiquity
Lose their lustre in his presence.
Born the benefactor of mankind
He united all the qualities necessary
To an illustrious career.

Nature made him great ;
 He made himself virtuous,
 Called by his country to the defence of her liberties,
 He triumphantly vindicated the rights of humanity,
 And on the pillar of National independence
 Laid the foundations of a great republic.
 Twice invested with supreme magistracy,
 By the unanimous voice of a free people,
 He surpassed in the cabinet
 The glories of the field,
 And voluntarily resigning the sceptre with the sword,
 Returned to the shades of private life.
 A spectacle so new and so sublime
 Was contemplated with the profoundest admiration.
 And the name of George Washington,
 Adding new lustre to humanity,
 Resounded to the remotest regions of the earth.
 Magnanimous in youth,
 Glorious through life,
 Great in death.
 His highest ambition, the happiness of mankind ;
 His noblest victory, the conquest of himself ;
 Bequeathing to posterity the inheritance of his fame,
 And building his monument in the hearts of his countrymen,
 He lived the ornament of the Eighteenth century,
 He died regretted by a mourning world."

"SERVANT OF GOD WELL DONE."

CHARLES LATIMER.

THE ALTAR AND PILLAR TO JEHOVAH.

III.

Herodotus, on the authority of the Egyptian priests, says that the Great Pyramid "was built in steps, battlement-wise, or according to others, altar-wise." According to this, "battlement-wise" and "altar-wise" were one and the same, and this leads to the enquiry, May there not have been a more intimate relation between the battlements and the altars of the ancients than is generally supposed? For an answer to this question I have consulted the Bible, as well as I could in a brief space of time, and without any knowledge of the Hebrew, and have come to the conclusion that the pyramids of Egypt, and similar structures of other countries, are referred to in the Bible under the name of "altars," "towers," "treasuries," "mountains,"

and "high places;" and are also designated by a word synonymous with "towers," but mistranslated "walls," confounding the isolated defences in the most of cities with the continuous defences round about them; also that all these structures were characterized by terraced or battlemented sides, except that in many instances these sides were finally covered with either plaster or casing stones, as if to symbolize the fact that their pyramidal figure was to be lost sight of under the mists of antiquity, and under consequent misunderstandings and mistranslations of the Hebrew Scriptures. Of course, it would be the height of presumption in one ignorant of the Old Testament original and of archæology to do more than direct the attention of the learned to the class of passages from which I draw my conclusions, assuring them that I do so in the hope that they will give the subject a thorough examination, and will establish the truth of the matter either *pro* or *con*. Should it be found that I have concluded correctly, the result will be another step towards the discovery of an interdependence between the inspiration of the Bible and that of the Great Pyramid, in fulfilment of the prediction of the pastor of the pilgrims, that "more light was to break forth from the Word of God."

The first mention of a tower in the Bible is that of Babel, the tower of Babylon; and there are satisfactory reasons for believing that it was a terraced pyramid, like the mastaba of Egypt, from which Nimrod, the rebel son of Cush, journeying "eastward" from "the land of Ham," is likely to have derived his inspiration. "Go to," said the rebel horde, "let us build us a city, and a tower whose top may reach unto heaven." Of the "ladder" seen by Jacob in trance vision, which the artists have always had sense enough to represent as a flight of steps, similar to that on either side of the elevation on which the ancient Greeks placed their pantheon, it is said that it was "set up on the earth, and the top of it reached to heaven." Between the dream of Jacob and that of Nimrod there was this difference, however: that Jacob's was fulfilled to perfection, in the heaven-inspired work of the first-born son of his chosen wife, while Nimrod's was but partially fulfilled, falling short of the heaven to which it aspired, the Gods com-

ing down, and so confounding the language of the builders that "they left off to build." And yet, the original design of Nimrod demanded an attempt to carry it out; and long afterwards, on the spot on which the tower was to tower to heaven, there "was erected the pyramidal temple of Bel-Merodach, finally repaired by Nebuchadnezzar, the ruins of which at Borsippa are now known as Birs Nimrud—citadel of Nimrod." So says Appleton's new edition of the American Cyclopaedia. The tower of Babel, or of Babylon, like "the tower of Syene," was in fact a citadel in the midst of a city. In Bel-Merodach Nebuchadnezzar placed the spoils of Jerusalem. It had, therefore, interior chambers, or treasury vaults, and was a treasury stronghold. Herodotus describes it as "a solid tower of a stadium in depth and width, upon which another tower is raised, and another upon that, to the number of eight towers." This makes a pyramid of eight great terraces, or so many stories of a pyramidal store-house, dedicated to the guardianship of ill-gotten treasures rather than to that of sacred mysteries and the worship of Jehovah. One of the burnt bricks of which it was composed, discovered in the ruins, bears this inscription: "A former king had built it (they reckon 42 ages); but he did not complete its head. Since a remote time the people had abandoned it, without order expressing their words. Since that time the earthquake and the thunder had dispersed its sun-dried clay." The Scripture account is thus wonderfully confirmed, except in regard to the brick; and as to this we are told that the people *said*, "Go to, let us make brick, and burn them to a burning," not that they *did* burn them; or by "burn them to a burning" may have been meant, *subject them to the light and heat of the sun*, which the ancients called "pure fire;" for the monotheism of Noah, except in the Heber branch of the descendants of Shem, had already degenerated into worship of the symbols of Jehovah of hosts, the sun and moon, and the hosts of heaven. The impious attempt to climb from earth to heaven without the recognition of a Mediator between God and man, was destined to be defeated. Remembering that the primary meaning of the word "Babel" is "gate of God," and that the word "teocalli," the name of a like kind of pyramid

in ancient America, means "house of God," it is remarkable that on awaking from his dream of the stairway from earth to heaven, with the angels of God ascending and descending upon it, and with Jehovah above it, Jacob exclaimed, "How dreadful is this place! This is none other but the house of God, and this is the gate of heaven."

The next mention of a tower in the Bible, is in Gen. xxxv, 21, where we read that "Israel journeyed and spread his tent beyond the tower of Edar." This, in itself, is a very simple and uninformative statement, but it becomes very significant in the light of the prophecy in Micah, iv, 8: "And thou, O tower of the flock, the stronghold of the daughter of Zion, unto thee shall it come; even the first dominion; the kingdom shall come to the daughter of Jerusalem;" and this prophecy depends greatly for its significance on the fact that the "tower of Edar" (which means "tower of the flock") was near to Bethlehem, where was to be born "Him who was to be ruler in Israel," and near to Jerusalem, where he is to reign forever "before his ancients gloriously." I take this literal "tower of the flock" to have been a watch-tower, from the top of which the shepherds, not only those of Jacob's day, but those to whom "the angel of the Lord" announced the birth of the long-promised "Saviour and King" in the near-by city of Bethlehem, "watched their flocks by night," ready at a moment's warning to hasten down its terraced sides to their protection.

And the "Tower of the flock," to whom is addressed such language as that of Micah—who can it be but "the Shepherd, the Stone of Israel," including, representatively, as the capstone of the Pyramid representatively includes the Pyramid as a whole, "the sheep of his pasture and the work of his hands?" Who can it be but the "Living Stone, elect, precious," constituting the Christ, "the Living Head," including the "lively stones" constituting "the Body of the Christ?" Who can it be but "the Captain of Salvation," the "Victor over death and hell," represented by the jasper monolith, or blood-stone, and representatively including his "twelve foundations," inscribed with "the names of the twelve apostles of the Lamb," of whom the chosen representative, as feeder of his sheep and

lambs until his return, is Peter, the rock on whose battlemented sides he will build his church so impregnably that "the gates of hell shall not prevail against her?" Again, as to the "tower of the flock" beyond which Israel "spread his tent," on his way from Bethlehem to "Hebron, where Abraham and Isaac sojourned." If I am right in identifying Joseph with the shepherd Philitis, it must have preceded the Great Pyramid, and is likely to have been built by "Melchizedek, king of Salem and priest of the Most High God," to prefigure his successor, the "High Priest forever after the order of Melchizedek," and the Great King of Salem forever in the line of the same august and mysterious personage.

The next Bible mention of a tower by name, if I mistake not, is that of the Great Pyramid itself, under the name of "Migdol," which means, according to the Hebrew lexicographers, "a tower," involving the idea of "greatness." According to this the Great Pyramid was the Great Tower, or *the* tower, *par distinction*, and appears to have given name to the entire Gizeh hill, if not to the entire region between the two royal residences, Noph on the south and Tahpenes on the north, afterwards Memphis and what is now "the decayed and filthy village of Gizeh, once adorned with magnificent palaces." (See INTERNATIONAL STANDARD, p. 476.) The mention of Migdol to which I allude is this: "Speak unto the children of Israel, that they turn and encamp before Pi-ha-Hiroth, between Migdol and the sea, over against Baal-Zephon; before it shall ye encamp by the sea." (Ex. xiv, 2.) By this I understand that they encamped, at the end of their third day's journey, between Migdol on the west, from which they set out, and the sea on the east, by which they were stopped, with Pi-ha-Hiroth, *i. e.*, "the mouth of Hiroth, or the passage of Liberty," close to the south of them, to mark the place of the entrance and passage of the Red Sea, and with Baal-Zephon, *i. e.*, "the lord of the North," a little to the north of them, to indicate their ultimate destination, in respect to both place and power.

You say that the Israelites did not set out from Migdol, but from Rameses, and in proof of the fact you refer me to Num-

bers, xxxiii, 3, where we read, "And they departed from Rameses in the first month, on the fifteenth day of the first month: on the morrow after the passover the children of Israel went out with a high hand, in sight of all the Egyptians." Yes, and this Rameses was not a city, but one of the treasure citadels, mistranslated, "treasure cities," referred to in the passage, "And they built for Pharaoh treasure cities, Pithom and Raamses." (Ex. i, 11). That these were "treasure strongholds," or citadels, rather than cities, and that they were situated somewhere between On and Noph, *i. e.*, between Heliopolis and Memphis, is generally admitted. The map of Egypt in Bagster's Polyglot, illustrating the exodus, represents the Israelites as setting out from the near neighborhood of Heliopolis, which was about ten miles from the Great Pyramid; but instead of representing them as going due east, by the shortest and quickest route to the sea, where they were to pass over dry shod, and the Pharaoh and his host were to be drowned, it represents them as making a great detour in the direction of Rameses in Goshen, as if God intended them to return to the land of the Philistines by the route by which they came to the land of Egypt, but afterwards changed his mind and led them to a place where they could only proceed by the working of a miracle. The sacred historian says: "And it came to pass when Pharaoh had let the people go, that God led them not through the way of the land of the Philistines, although that was near; for God said, lest peradventure the people repent when they see war, and they return to Egypt. But God led the people about through the way of the wilderness of the Red Sea. And the children of Israel went up by five in a rank out of the land of Egypt." (Ex. xiii, 17-18). By this I understand that the children of Israel, instead of returning to the land of the Philistines by way of Rameses, in Goshen, and thence by the ordinary, short, and apparently only common-sense route, proceeded eastward on the latitude of the five-cornered Great Tower, "led by Jehovah in the pillar of cloud by day and of fire by night," until their forward march was stopped by the sea, when they "turned" back to the convenient camping ground "before Pi-ha-Hiroth, between the Great

Tower and the sea, over against Baal-Zephon," where, forming an extensive line of encampment parallel with the shore, they rested till the commandment to Moses, "Speak to the children of Israel that they go forward," when they passed "through the midst of the Red Sea," and were "led about through the wilderness of the Red Sea," the desert of Arabia, for the space of forty years, all for the purpose of ensuring their escape from the bondage of Egypt, and of making their return to it an impossibility.

When Pharaoh said to Moses and Aaron, "Go ye, sacrifice to your God in the land," Moses replied, "It is not meet so to do; for we shall sacrifice the abomination of the Egyptians to Jehovah, our God: lo, shall we sacrifice the abomination of the Egyptians before their own eyes, and will they not stone us? We will go three days' journey into the wilderness, and sacrifice to Jehovah, our God, as he shall command us." Pharaoh then said: "I will let you go that ye may sacrifice to Jehovah, your God, in the wilderness; only ye shall not go very far away." (Ex. viii, 25-28). What is this "abomination of the Egyptians" so likely to have been as that which made "every shepherd an abomination to the Egyptians,"—not cattle, but sheep? Therefore, not a remnant of the paschal lamb, in the many thousand families of Israel, was allowed to remain till morning; all not eaten was burned, to avoid provoking the hostility of the Hamitic Egyptians, which was one with that of tower-building Cain toward altar-building Abel, on account of his acceptable symbol of the promised Redeemer. On the morning after the passover, therefore, it became the Israelites to make as great haste out of Egypt as possible. The "three days' journey" was a hasty, straight-forward flight, like that of a flock of sheep intent on escape from a pack of wolves, ready at any moment to start in pursuit of them; and when accomplished, it formed, with the prospective passage of the Red Sea, with Baal-Zephon on the north, and with Pi-ha-Hiroth (now Clysoma) on the south, a symbol of the crucifixion of the Lamb of God, the "strait and narrow way" of escape from a worse than Egyptian bondage, "the bondage of sin and death," to life eternal. A staggering, wavering, serpentine line of

march out of Egypt, such as that commonly represented, is totally inconsistent with the significance of the unfermented bread and wine of the passover, and with the necessity of eating the bread and paschal lamb "in haste, with their loins girded, their shoes on their feet, their staff in their hand," and the vessels containing their dough "bound up in their clothes upon their shoulders."

"On the morrow after the passover, the children of Israel went out with a high hand in the sight of all the Egyptians;" and where from, if not from the monumented *midst* of the Egyptians, the center of attraction and the cynosure of all eyes? The conspicuous boldness of the proceeding was all the more reason for straightforward expedition in the execution of it. Moreover, "Moses took with him the bones of Joseph; for Joseph had straightly sworn the children of Israel, saying, 'God will surely visit you; and ye shall carry up my bones away hence with you.'" (Ex. xiii, 19.) And as the body of Joseph was not buried, but was simply "embalmed and put in a coffin in Egypt" (Gen. 1, 26), awaiting interment in the burial-place of his ancestors, I believe that the definite spot indefinitely called "Egypt" was the representative *midst* of Egypt, and that the "coffin" was the granite coffer in the west end of the King's Chamber, in the direction of the ultimate destination of the sons of Joseph, "the horns of an unicorn," the two horns of a one horn, with which he was to "push the people to the ends of the earth," *i. e.*, to the northern and southern divisions of the New World, represented by the upper and lower halves of the skeleton occupant of the granite "measure of the man, *i. e.*, of the angel," whom we know Joseph to have been. The architect of the Great Pyramid was the first royal arch mason, and the military and religious fraternity of free and accepted masons (not slaves), of which he was the head, must needs have enshrined him with masonic honors; the deceased king, Cheops, having declined the honor in favor of the man through whose instrumentality he had been converted from idolatry to the worship of Jehovah; and Cephren, who stood in nearly the same relation to him, being foremost of the living to do him reverence.

In the fourth dynasty, when the use of natron in the art of embalming was as yet unknown, the embalming of the body of Joseph did not make a mummy of it, but allowed it to decompose and leave the bones and a little carbonaceous dust at the bottom of the sarcophagus. Moses took possession of the bones, leaving only the black dust for us; and how? I believe that he and Aaron, being "learned in all the wisdom of the Egyptians," found their way to the King's Chamber on the fearful night of the passover; not through the obliquely ascending passage, this having been stopped by the granite portcullis directly after the embalmed body had been left in its casket, but through the crooked upright passage, by the aid of a ladder, from the subterranean entrance of what I call the Great Pyramid's intestinal canal, through the pyloric orifice, so to speak, into what I call the stomach, the analogue of the "whale's belly" and "the heart of the earth," and from this, through the cardiac orifice into the esophagus, and out of this into the right hand side of the beginning of the Grand Gallery, "bursting asunder the bars of death" and "rolling away the stone," thus accounting for the Great Pyramid's symbol of the resurrection of our Lord in a manner altogether natural. I suppose that in the King's Chamber they found, not only "the bones of Joseph," but his treasures, his gold and silver standards of capacity measure, the "vessels of the sanctuary," including that unit of capacity, "the silver cup with which he did divine," besides gold and silver in the form of Israel's predestined standards of weight and linear measure; and in the Queen's Chamber his masonic regalia, with the masonic jewels of every degree, besides the typical robes of the foreordained Aaronic priesthood, with the Urim and Thummim and all the precious stones of the ephod and the breastplate; and I suppose that they took possession of all these treasures as the rightful inheritance of the children of Israel, leaving only their embodiment in the parts and proportions of the Great Pyramid, to be deciphered and brought forth by means of their possession four thousand years afterwards. The spoliation of the Egyptians in borrowing from them "jewels of silver and jewels

of gold, and raiment," in compensation for the one hundred years of unrequited toil, was to cover up the corresponding spoliation of the Great Tower, was it not? in case such jewels should be observed by the tell-tale "mixed multitude" on the persons of "the Hebrew women;" and as to the gold and silver vessels, requiring to be concealed "among the pots" of "six hundred thousand men on foot," I fancy them made receptacles of a part of the dough "bound up in their clothes upon their shoulders." So, you see, I think poor Al-Mamoun not so much deceived in regard to the treasures in the Great Tower, the tradition of which had come down to him from his Ishmaelite ancestors, as in not knowing that he had been anticipated by the two great Isaacsons of the tribe of Levi, Moses and Aaron.

This idea of Moses having taken the bones of Joseph from the granite sarcophagus in the midst of Egypt is brought forward as an argument in favor of the idea that the exodus from Rameses was from the near neighborhood of Migdol, the Great Tower, another name for the Great Pyramid. The force of the argument hinges mainly upon proof that the builder of the Great Pyramid was Joseph, making it probable that his embalmed body was deposited in its sacred interior. But that such was the fact is stoutly denied, on the ground that Joseph's viceroyalty, according to the Egyptologists and chronologists, was some centuries later than the pole-star date of the Great Pyramid, which was 2,160 B. C., according to Sir John Herschel, or 2,170 B. C., according to Prof. Piazzzi Smyth. Of course, the chronological argument cannot be entered into here; but I may say without fear of contradiction, that the testimony of the Egyptologists and that of the learned commentators on the Bible are out of harmony with each other by many centuries, and that where doctors so greatly disagree a third party may possibly be called in to decide. At any rate, no one need be too positive in denying the contemporaneousness of Joseph's viceroyalty and the building of the Great Pyramid until he has patiently read all the arguments in favor of it. Meantime, circumstantial evidences may be allowed their due weight, even if

they *do* precede the chronological. An *alibi* has not been proven, by any means.

One of the reasons for believing that the Migdol spoken of in the geography of the last encampment of the Israelites in Egypt was the Great Pyramid, or more probably the pyramids constituting "the Gizeh group" named from the first and greatest of them, is that to the retrospective view, in a journey eastward from the Rameses allowed to have been the starting-point of the exodus, it presented the most conspicuous landmark on the horizon. Another reason is, that the itinerary of the three days' journey, with the prospective passage of the Red Sea, *Yam Suf*, or Sea of Reeds, forms a cross, of which the passage represents the bleeding head, crowned with thorns; of which the encampment "by the sea, beside Pi ha-Hiroth, before Baal-Zephon," represents the heart, from which flowed blood and water, nearer to the left side than to the right; of which Pi-ha-Hiroth (*the passage of Liberty*) represents the left hand, extended towards enslaved Africa; of which Baal-Zephon (*the lord of the North*) represents the right hand, extended toward lordly and more distant Europe; of which Etham (*strength*), the end of the second day's journey, represents the navel (Job xl, 16); of which Succoth (*a booth*), the end of the first day's journey, represents the secrets; and of which Rameses, or Raameses (*thunder*), the starting-point of the journey, the treasure tower between the treasure towers Migdol and Pi-thom, represents the feet, planted on a rock, a symbol of the Rock of Ages.* "By faith" in the promised Redeemer, "Moses refused to be called the son of Pharaoh's daughter, choosing rather to suffer affliction with the people of God than to

* Speaking of the Gizeh rock, I wish here to correct a foolish mistake in my last,—that of referring to Prof. Smyth as saying that the Great Pyramid is partly founded on an embankment composed of the chippings of its own stones. Prof. Smyth's language on this subject, on pages 87 and 88 of "Our Inheritance," is this: "So very close was the Great Pyramid placed to the northern brink of its hill, that the edges of the cliff might have broken off, under the terrible pressure, had not the builders banked up there most firmly the immense mounds of rubbish which came from their work, and which Strabo looked so particularly for 1,850 years ago, but could not find. Here they were, however, and still are utilized in enabling the Great Pyramid to stand on the very utmost verge of its commanding hill, within the limits of the *two* required latitudes, 30° and 29° 58' 23", as well as over the center of the land's physical and radial formation; and at the same time on the sure and proverbially wise foundation of rock."

enjoy the pleasures of sin for a season;" and here, on the ground, in Egypt, "where also our Lord was crucified," was projected a symbol of that faith and of the Rock on which it was founded.

You admit, as do all good Hebrew scholars, that "Pithom and Raamses" were "treasure strongholds," rather than "treasure cities," but say that if I place them on the Gizeh rock, beside the oldest and greatest of the Gizeh group, with Raamses for the middle of the trio, I must show good reason for the exodus being spoken of, at the outset, as having started from Rameses (another way of spelling Raamses), and for its being looked back upon, at the end of the three days' journey, as having started from Migdol, the Great Tower, meaning either the Great Pyramid in particular or the Gizeh group in general. A good reason for Raamses being recognized, at the outset, as the place of departure, I take to be this: that it was built by Moses himself, the organizer and leader of the exodus. That it was built by Moses as "the son of Pharaoh's daughter," for his foster grandfather, the "king who knew not Joseph," is evident from the name, this being composed of *Ra*, the god of light, who was worshipped at Heliopolis, and *Moses*, which means "drawn forth," as a cloud is drawn from the water, and as lightning and thunder are drawn from the cloud. In the case of Rameses II, who from his title of "Sesu-Ra" became the mythical Sesostris of the Greeks, and who flourished many centuries after Moses, the prefix, "Ra," was made a suffix, the title "Sesu-Ra" being given him by the people, "for some unknown reason," say the authorities, "during his lifetime." I mention this simply to show that the first syllable of the name Rameses, or Raamses, refers to the god Ra, and that to be clearly intelligible the name should be written Ra-Moses, or Ra-Amoses. The vowels in Hebrew not being written, but indicated by vowel points, were exceedingly subject to variation; and hence Ra-Meses may easily have been Ra-Moses, and Ra-Ameses may easily have been Ra-Amoses. The prefix is most likely to have been added by the Pharaoh who said to Moses and Aaron, "Who is Jehovah, that I should obey his voice to let Israel go? I know not Jehovah, neither will I let

Israel go;" for it was in reference to this Pharaoh that Jehovah said unto Moses: "See, I have made thee a god to Pharaoh, and Aaron, thy brother, shall be thy prophet." (Ex. vii, 1.

Previous to this the God of Israel had said to Moses in respect to Aaron: "He shall be to thee instead of a mouth, and thou shalt be to him instead of God." (Ex. iv, 16.) And this leads me to speak of the significance of the word Pithom, the name of the other of the two "treasure strongholds" built for the Pharaoh who "knew not Joseph" by "the people of the children of Israel." The word, according to Cruden, means "*their mouthful*" and answers well to the decree, "He shall be to thee instead of a mouth," and to the text, referring to the words of God, "Open thy mouth wide and I will fill it." (Ps. lxxxii, 10.) I think, therefore, that Ra-Ames and Pithom were built by Moses and Aaron, "the people of the children of Israel," for Pharaoh Mycerinus and a daughter of his, to whom Moses was as intimately related as Philistine Joseph was to Cheops and Cephren, and over whom he exerted an influence as powerful in the sphere of the domestic and social as that of Joseph over Cheops and Cephren in the sphere of the civil and religious. The Great Treasure Tower had been built for Cheops and Cephren by Joseph; Mycerinus and his daughter wanted to be honored and served in the same way, by another wonderfully wise Israelite; and who so wise, and yet so subject to their will, as the one reared from infancy as their own son and grandson in the royal palace? The greater of the two towers entrusted to his architectural skill and inspiration, the one for the Pharaoh, was enough for Moses, and he could easily entrust the building of the one for the Pharaoh's daughter to his dignified and highly gifted brother Aaron.

I would hardly have ventured upon this exposition if it were not sustained by the learned. In an old book entitled, "Sacred Geography," by Elijah Parish, D. D., I read in regard to what the Egyptian priests told Herodotus concerning the three great pyramids of Gizeh: "They also say 'that the first was built by Armœus, or Aramœus, the Syrian; the second by Ammosis; the third by Inaron.'" The writer adds: "This coincidence of names will appear complete if we look at the

words without their prefixes. *A Mosis*: in Hebrew his name was *hy Mouseh*; in *Aron*, his *Aaron*. All this supports our supposition that the Israelites built the (three great) pyramids (of Gizeh.) Under the first name, *the Syrian*, or *Aramean*, is the very title given to Jacob, Deut. xxvi, 5: 'A Syrian ready to perish was thy father, and he went down into Egypt.' In regard to this, I think that Joseph, the so called Philistian, named the Great Pyramid after his father Jacob, the Syrian, on account of Jacob's having foreseen it, in trance vision, in its battle-mented condition, with the angels of God ascending and descending upon it, and on account of Joseph's having first heard the story of it from his father's lips while yet in Palestine. Still another name for the Great Pyramid was "Ur," *i. e.*, "Great," the name by which it was known as the pyramid of Cephren; and this name may have been given it by Joseph, when he was Prime Minister for Cephren, in honor of his father Abraham, who was from "Ur of the Chaldees," which may mean that his ancestral derivation was from the region of the tower of Babel, that being the Chaldea most frequently referred to in the Bible.

After this respectable array of evidence in regard to the starting-point of the exodus and the identity of the Great Tower with the Great Pyramid, it is a sort of necessity to pre-

	G.P. Migdol, Aramæus, Altar to Jehovah	Ra- Amoses, Ammosis	Pi- Thom, Inaron.	
Soris 1st King of 4th Dy- nasty. R. 29 yrs.	Suphis Shofo, or Cheops. R. 63 years. Sire and Son in Kingship; Brothers in Masonry and Mon- otheism.	Sen-Suphis, Nu-Shofo, or Cephren. R. 66 years.	Mencheres or Mycer- inus and daughter, son and granddaughter of Cephren. R. 63 years.	Ratceses, or Asyches, of the hard heart. Drowned in the Red Sea. R. 25 years.
Joseph in prison for his virtue, 10 years.	Joseph, the so-called Philistian, Premier of Cheops and Cephren, 80 years.	From the death of Joseph to the birth of Moses, 50 years.	Moses in the Pharaohs' pal- ace as son of the princess, 40 years.	Moses in Midian till the Exodus, 40 years.

Parallel between the sojourn of the Israelites in Egypt and the period of Egyptian history connected with the three great pyramids of Gizeh.

sent a diagram, illustrating, however imperfectly, a parallelism

between the Bible history of the Israelites in Egypt and the Egyptological history of the fourth dynasty from its beginning till after the construction of the last of the three great pyramids of Gizeh, which runs into this dynasty's oppressive, disastrous, revolutionary end. Beginning the parallel between the sojourn of the Israelites in Egypt and the period of Egyptian history connected with the three great pyramids of Gizeh with the reign of Cheops, and ending with that of Asyches, the sum of the reigns, according to Manetho, is 217 years. Beginning with the prime ministry of Joseph, when he was thirty years of age, the sojourn of the Israelites in Egypt, according to Usher, was 210 years—as many years as there are Royal Babylonian cubits in the base side of the last of the three great pyramids built during that time. The seven years' difference between this sum and the other belongs to the life of Joseph in prison under Cheops, following the three years under Soris, supposing him to have been cast into the king's prison by the lewd wife of Potiphar when he was twenty years old, three years after his purchase as a slave, at which time he was seventeen. With this proviso it is easy to see that the parallel periods of the history of the Israelites in Egypt, beginning with the reign of Cheops, amount to just 217 years—seven years of Joseph in prison under Cheops; eighty years of premiership under Cheops, or rather over Cheops and Cephren, which ended with his death; fifty years from this till the birth of Moses, the son of Amram, the son of Koath, the son of Levi; forty years from this to his voluntary exile in Midian, in Arabia Petrœa, from the deadly wrath of his foster grandfather, and forty years from this till his return to Egypt, at eighty years of age, to demand from the successor of his dead foster grandfather the liberation of the Israelites, and to be to them another shepherd, bearing the prophetic bones of Joseph before them to the land of promise.

The Great Pyramid is generally supposed to have belonged to Cheops alone, but I think it belonged to both Cheops and Cephren, as brother masons and suppressors of idolatry, under the influence of their monotheistic and divinely inspired Prime Minister. Their successive reigns of sixty-three and sixty-six years make it vastly more natural to suppose them to have

been sire and son than to suppose them to have been brothers by blood; and the fact that the names of both, as "Shofo and Noum-Shofo," are found in red paint on one or more of the Great Pyramid's interior stones of construction, makes it probable that their fraternity was that of brother masons, and also that the Great Pyramid was built for both. From this it follows that the second of the three great pyramids was in all probability built for Mycerinus, who is called the son of Cheops, but is more likely to have been the son of Cephren and grandson of Cheops, unless he came to the throne at ninety or one hundred years of age, rather than twenty-five or thirty, sixty-three years before his death. As to the third pyramid, seeing that it is comparatively small and encased with red granite, an igneous rock, while the others are encased with marble, an aqueous rock, I think it was built for a daughter of Mycerinus. In keeping with this idea is the circumstance that Aaron, the builder of the red granite pyramid, was destined to represent the church element of the Hebrew theocracy in the person of its high priest, to turn the waters of Egypt to blood by the stretching forth of his rod, to shed the blood of the clean beasts chosen for sacrifice, and to offer sacrifices and burnt-offerings upon the altar; while Moses, the builder of the white marble pyramid next to the red granite, was destined to represent the state element of the Hebrew theocracy in the person of its law-giver, to part the waters of the Red Sea by the stretching forth of his rod, to bring water out of the rock by smiting it, and to hew out, probably from a part of the same continuous stratified rock, the two easily broken tables of stone, on which to receive Jehovah's inscription of the ten commandments, midst the thunders and lightnings of the waters above the firmament, from the flaming top of mount Sinai. As for the daughter of Mycerinus, for whom I think Aaron built the red granite pyramid, I take her to have been the princess called by Herodotus the daughter of Cheops, about whom the Egyptian priests told him such a scandalous story concerning the means by which she obtained the granite blocks for the construction of her pyramid; pointing her out, I think, as the foster mother of the baby Hebrew, found by her in the ark of bulrushes.

among the flags of her bathing place in the waters of the Nile. The woolen enswathment on the dried up part of a body found in the elaborately carved sarcophagus in the granite pyramid, in defiance of the propriety of linen for such purposes, may indicate that the compassionate foster mother of Moses, near the close of her life, while he was yet in Midian, became converted to his religion; and this may explain why the Egyptian priests gave Herodotus to understand that she was the daughter of Cheops, the first great convert to the religion of Joseph. The child Moses was but the fourth generation after the settlement of the Israelites in Egypt, and his young foster mother was but the fourth generation from Cheops.

Of course, it is somewhat against the parallel which I have drawn that it does not agree with the learned authorities called Egyptologists. Bunsen, *e. g.*, says that the sojourn of the Israelites in Egypt was 1,434 years, though Moses, as explained by Paul in Gal. iii, 17, allows it to have been but 210 years. With due deference to learning, it is well to ask ourselves, on the subject of the Israelites and their ancestors, Which is the better authority, and which ought to be subservient to the other in the work of interpretation, Egyptology or the Bible?

J. W. REDFIELD.

***THE GEODESIC THEORY.**

The Geodesic Theory was advanced in 1882, by Robert Ballard. C. E., Queensland, Australia.

As it is far more than a merely ingenious consideration of this inexhaustible subject, and as it deals with the whole Gizeh group of pyramids rather than with the interior part of the great one alone, and concerns itself with geodesy in particular, I deem it worthy of a separate place in my classification and of a most careful review.† To pyramid students in general it will be regarded but as a subordinate part of that general solution of the problem which is advocated by the school of Prof. Smyth. Such, in one sense of the word, is my own conviction. Nevertheless it is worthy of an independent consideration. Its originator obtains from his discussion a firm conviction that all the pyramids of Egypt were built and employed, among other purposes, for one special, main and important purpose of the greatest utility and convenience." He takes the Gizeh group for the basis of his theory, "as being the one affording most data and as being probably one of the most important groups. He finds that this entire group is arranged upon a system of right-angled triangulation of the simplest character. Thus the centers of the bases of Cheops and Mycerinus (the 1st and 2d pyramids) define the extremities of the hypotenuse of the celebrated Pythagorean triangle, 3, 4, 5, and those of Cheops and Cephren (1st and 2d pyramids) mark the hypotenuse of the right-angled triangle, 20, 21, 29, even more beautiful than that of Pythagoras "because more practically useful." Developing the system thus established upon these triangles as BASES, he obtains a geodesic plan the length of all of whose mathematically defined lines he is enabled to throw into a series of "connected natural numbers, each of which on being multiplied by 8 becomes reduced to R. B. cubits, (so named because this cubit closely resembles the Royal Babylonian cubit of 1.683399

* Published by John Wiley & Sons, New York.

† Selections from certain unpublished "Notes on Pyramid Studies," by C. A. L. Totten, U. S. Army.

British feet). The length of this R. B. cubit which thus works in without fractions on the beautiful set of natural numbers which connect the whole group," is 1.685066 British feet.

As the R. B. (Robert Ballard) cubit differs from the Royal Babylonian cubit by only 1-600 of a foot (!) which is closer than most any two good English two-foot rules will be found to agree, Mr. Ballard is disposed to believe that he has discovered the true length of the original Royal Babylonian cubit itself, and given us at least the *working* measure of the ancient Egyptians. Mr. Ballard next constructs a table of measures which fits the plan and fits the circumference of the earth.

This table in brief may be put as follows :

50 R. B. Cubits	make	1 Plethra	or	Second.	
{ 6 Plethra	"	1 Stadia.			} These were ancient Roman, etc., measures.
{ 10 Stadia	"	1 Minute.			
60 Seconds	"	1 Minute.			
60 Minutes	"	1 Degree.			
360 Degrees	"	{ 1 Polar circumference of the earth.			
		{ (=77760030 R. B. Cubits = 24.81642 miles.			

Remarking upon his tables thus deduced, Mr. Ballard claims "for the R. B. cubit that it is the most perfect ancient measure yet discovered, being the measure of the plan of the pyramid of Gizeh." Continuing his discussion, Mr. Ballard determines the exact measure of the bases of the principal pyramids of the Gizeh, their slopes, ratios and angles, and finally shows that all of them are based upon the general proposition that, "in any pyramid the apothem is to half the base as the area of the four sides (triangular) is to the area of the base." He next verifies the statement of Herodotus, that "the area of each of the four faces of Cheops was equal to the area of a square whose base was the altitude of the Pyramid," and establishes thereon the theory that "this Pyramid (the great one) was *the exponent of lines divided in mean and extreme ratio.*" Having carefully discussed the various measured dimensions of the angle, quoin or casing stones of these pyramids, he next shows upon what a simple system of "templates" the actual stone-work at the group might have been accomplished by its skilful masons. Mr. Ballard next discusses the peculiarities of the triangles, 3, 4, 5, and 20, 21, 29, deduces from them some other equally important ones, and finally, under this head, gives a general

view and identification of these six triangles, which occupied an important position in the trigonometry of a people who did all their work by right angles and proportional lines." With these triangles as functions, Mr. Ballard completely occupies one entire circumference, and thus makes out his point that such a system *could* have formed the basis of a practical Egyptian trigonometry. He then, at some length, elaborates the most important feature of his theory. "About twenty-three years ago," he says, "on my road to Australia, I was crossing from Alexandria to Cairo, and saw the pyramids of Gizeh. I watched them carefully as the train passed along, noticed their clear-cut lines against the sky, and their constantly changing relative position. I then felt a strong conviction that they were built for at least one useful purpose, and that purpose was the survey of the country. I said, here be the theodolites of the Egyptians, built by scientific men well versed in geometry, but unacquainted with the use of glass lenses. These great stone monuments are so suited in shape for the purpose of land surveying, that the practical engineer or surveyor must, after careful consideration, admit that they may have been built mainly for that purpose. Not only might the country have been surveyed by these great instruments, and the land allotted at periodical times to the people, but they, remaining always in one position, were there to correct and readjust boundaries destroyed or confused by the annual inundations of the Nile. * * * The pyramids of Egypt may be considered as a great system of landmarks. * * * Those of Gizeh appear to have been the main ones. The system through the subordinate groups may have extended from Chaldea through Egypt into Ethiopia. The land of Egypt was valuable and maintained a dense population; every year it was mostly submerged, and the boundaries confused. Every soldier had six to twelve acres of land; the priests had their slice of the land, too. After every war a re-allotment of the lands must have taken place; perhaps every year. While the water was lying on the land, it so softened the ground that the stone boundaries must have required frequent readjustment. By the aid of their great stone theodolites, the surveyors, who belonged to the priestly order, were

able to readjust the boundaries with great precision. The "closing" of one pyramid over another, in bringing any of their many lines into true order, must even now be very perfect; but we can only imagine the beauties of these grand instrumental wonders of the world, when the casing stones were on them. We can picture the rosy lights of one, and the bright white lights of the others; their clear cut lines against the sky, true as the hairs of a theodolite, and the sombre darkness of the contrasting shades, bringing out the angles with startling distinctness. Under the influence of the Eastern sun, the faces must have been a very blaze of light, and could have been seen at enormous distances like great mirrors. I declare that the pyramids of Gizeh, in all their polished glory, before the destroyer stripped them of their beautiful garments, were in every respect adapted to flash around clearly defined lines of sight, upon which the lands of the nation could be threaded. The very thought of these mighty theodolites of the old Egyptians fills me with wonder and reverence. What perfect and beautiful instruments they were! Never out of adjustment, always correct, always ready; no magnetic deviation to allow for. No wonder they took the trouble they did to build them so correctly in their so marvellously suitable positions. Let us, in the first place, comprehend clearly the shape of the land of Egypt. A sector, or fan, with a long handle—the fan, or sector, the delta, and the handle of the fan, the Nile valley—running nearly due south. The pyramids of Gizeh are situated at the angle of the sector, on a rocky eminence, whence they can be seen for many miles. The north and south lines could have been accurately run up and down the 'land of the waters' by 'plumbing' in the north star and the apex of the moonlit pyramid. The latitude of Cheops being known, and the annual northing and southing of the sun, the necessary sectoral lines could have been run in all directions as far as the extreme apex of the pyramid was visible by observations on the sun rising or setting (swallowed as it were) over his summit."

Mr. Ballard devotes no little space to the consideration of the various "natural lines" that would be flashed across the land of Egypt by such a group. The *cardinal* lines and those of

45° (I. 2 northeast, northwest, etc.) being particularly marked, and numerous others formed by the "closing in" of pyramid to pyramid, as the distant observers' station shifts and circles about the horizon. He next describes the character of "the ancient portable survey instrument," such as could have been modeled upon the system; such an instrument he believes to have been as simple in its construction and use as an ordinary modern "plane-table." It carried upon its upper limb a little group of pyramids, each pivoted upon its center and modeled upon the proportions and colors of the great Gizeh theodolites themselves. With such an instrument, provided with suitable sights and gearing, he clearly demonstrates that all the details of the annual Egyptian survey could be as accurately "filled in" as with our own modern "plane-table." The portable instrument could be readily "set up" at any locality, by observations upon the distant archetype, and by revolving the upper limb until the lights and shades and mutual eclipsing of the pyramid of each group—those of the model and those of Gizeh itself appeared to correspond. With the instrument at last thus oriented, any of the modern processes of surveying could have been accomplished.

Closing his argument, Mr. Ballard "conjures the investigator to view these piles *from a distance* with his mind's eye, as the old surveyor viewed them with his bodily eye. "Approach them too nearly," he exclaims, "and, like Henry Kinglake, you will be lost in the one idea of solid immensity. Common sense tells us they were built to be viewed from a distance. Modern surveyors stand *near* their instruments and send their flagmen to a distance. The Egyptian surveyor was *one of his own flagmen*, and his instruments were towering to the skies on the distant horizon. These mighty tools will outlast many a generation of surveyors."

This contribution of Mr. Ballard to our knowledge of the pyramids is of the most interesting character. He has developed there (caught, as it were, by inspiration almost at a single glance, as years ago he hurried by *upon a modern railroad!*) a brand new line of study, and seems to have fortified its premises very securely against attack. His little book should be in

the hands of every student who is interested and engaged upon this engrossing subject. His theory cannot fail to attract the attention that it merits; it is founded upon too solid a basis to be treated lightly, and must command respect.

It is subject, however, to the same pointed questions with which the purely scientific theorists, just noticed, can be interrogated. It is advanced as a probable theory, and so long as it is based upon a simple system of 3, 4, 5, triangulation, it is comprehensible upon its own merits, and aside from all other considerations seems to satisfy the entire arrangement of the Gizeh group in its relation to the land surveys of the whole surrounding locality commanded by it. So soon, however, as even its "working cubit" is shown to be as truly *earth-commensuric*, as from other considerations we shall later see that its hidden and more "sacred cubit" is, the whole mystery of the pyramid returns upon us with all its overwhelming immensity. No arguments have yet been advanced upon the purely scientific basis that give even a plausible explanation of *how* these narrowly encompassed people of the eldest days *could possibly* have determined the whole commensuration of the earth! The whole of it is certainly built into the pyramid, but it was also *sealed up* therein from every gaze for full 3,000 years! Such parts of its mere "working" units as were at all transmitted by the initiated when they left the land, were by their ignorant successors employed but blindly as things whose value they by no means comprehended. With the interior of the pyramid (*i. e.* of the great one) Mr. Ballard's theory has nothing whatever to do. He says, "I have paid little attention to the inside measurement. I take it we should first obtain our exoteric knowledge before venturing on esoteric research." This is all very well; he has reviewed the group from the standpoint of his *own* profession, which is essentially *an outdoor one*. But here again the very mystery of this monument looms up with all its overwhelming grandeur. It answers the surveyor just as it answers the astronomer, just as it has answered the geometer, the geographer, and every class of men who are interested in the commensuration of the earth on which we live! And these answers have come home so convincingly to each of them, that

each is satisfied the monument "was mainly erected to embody the principles "of their own special branch of investigation! Certainly such a monument would be "a sign and a wonder in the midst" of any land and at the noon of any day of man's career!

"It must be admitted," Mr. Ballard further adds, "that in the details of the building of the pyramids of Gizeh there are traces of *other* cubits than R. B. cubits." It is with these details, the interior and exterior details of the pre-eminently *Great* Pyramid, that its mystery has most to do. Mr. Ballard's figures and proportions corroborate the entire scheme of external and internal measures as presented by Professor Smyth, and furnish his school of followers with what will now be one of their new and strongest indirect supports. We are therefore strongly disposed to accept this theory, in the main, as undoubtedly explanatory of a subordinate use to which the pyramids might have been put in the days of their prime and beauty. Perhaps it was *the idea* as given out to the nation at large by its originators, the mysterious "Shepherd Kings." As an apology to the nation for the erection of such expensive structures, they could certainly have thus presented a far better case than by any ingenuity they could have formulated for a mere tomb or astrologic "hanky panky." In their efforts to conceal the interior parts and symbolism of the one truly *Great* Pyramid (to erect which, this strange people had actually come to Egypt, and upon whose completion they as strangely left it) no better system could have been adopted by the Hyksos than such an one as this. Among the few sound points that Professor Proctor, in his astrological theory (?) does establish to our satisfaction, is the probable fact of the contemporaneous commencement of at least all the principal pyramids in the Gizeh group. Though certainly subordinate to the pyramid of Cheops, which was completed nearly one hundred years before that of Mycerinus, the latter as well as others of the group, seem to have been begun during the lifetime of the original *Shepherd* pyramid builder. Upon Mr. Ballard's hypothesis (of at least a subordinate surveyors use for the monuments) we can account for such an overwhelming increase to the first cost of the structures. A great and lasting good was to be conferred

upon the people of the land, but also *a great secret was to be securely kept away from them.* There was the most gigantic system of freemasonry wrapped up in the whole scheme, and an extraordinary care was manifestly taken to conceal the intents and purpose of the principal element of the group. That this was effectually realized we know from the fact that its secret was not *discovered* until about A. D. 800, nor ever even partly *understood* until actually the day of this, our own most favored generation. To enlist the Egyptians in a vast system of national triangulation, by means of which their yearly obliterated landmarks could be most certainly redetermined, would be one of the most vital questions in such a land. Each man and family would be concerned to re-enter into the possession of his own property in the shortest possible time after the annual inundation. Every hour lost in Egypt after the subsidence of its sacred stream was measured in golden grains unrealized. The national interest thus enlisted would certainly not clog so long as the work remained unfinished. We have independent and convincing proof that this wonderful people hesitated at no undertaking which rendered a single drop of the River Nile available for bread and butter. It would thus be infinitely easier to unite the nation upon a group of structures destined for such a popular and even *personal* use, than even to *force* them at the lash of a task-master to build a merely royal tomb on a huge and costly astrologic folly. By a judicious arrangement of the workmen, *initiated* into various degrees of the real secret, those interested could all the more effectually conceal, even while it was building before their very eyes, the fact that "Cheops" was not solid, as were the others, from all who were not "Hyksos" or possessed of the "master masons'" secrets.

C. A. L. TOTTEN.

INTERESTING COMMUNICATIONS.

NORTH ABINGTON, MASS., December 10, 1883.

Dear Sir:—Three letters have come into my hands, which are very interesting certainly, and would be more, if one dared to hope that what they speak of would come to pass. But in order to make them quite intelligible, I must tell you how they came to be written.

At the time of the Annual Meeting, in November, I was at Mr. Bisbee's rooms. I mentioned to him a matter which I had been thinking of a good deal in connection with Great Pyramid affairs, viz: the establishment of an astronomical observatory on the top of that edifice. Mr. Bisbee immediately desired me to write down what I had in mind, which I did, and left it in his hands, not knowing what use he would make of it.

As it seems, he forthwith sent the memorandum to Professor Smyth, and the result has been the letters which I have now the pleasure of laying before you.

But, perhaps I had better give you first what my idea was, so that the whole matter may come in the natural order before you.

I have long felt that we ought to do something practical and of real value for the Great Pyramid. In this practical age, when people say so constantly, "Well, what good will it do?" we shall most honor the Great Pyramid by doing something for it of immediate benefit, and shall also do most to win sympathy and aid. What, then, could be more striking to the imagination, or of more real worth to men, of that kind of worth which the Great Pyramid stands for, than to make it a permanent astronomical station? To set our best modern astronomical science at practical work upon that vast, primeval building which the most ancient astronomical science erected so many ages ago, and in which it expressed its ideas with supreme majestic force, would be a noble act, establishing a most notable and worthy conjunction of the works of man. To me it seems well nigh too grand to be possible.

Then, again, consider how it would aid our cause. We desire to have the Great Pyramid made the starting post for all measurements of the earth's surface, just as it was originally used, and made to be used; but especially to have its meridian taken for the prime meridian for the whole globe. To restore the building thus to the uses for which it was intended by the builders, would be an act of the highest dignity, it seems to me, and one peculiarly befitting our modern civilization, which has grown out of the recognition of the worth of the ancients. Now all the force which Greenwich has grows out of the fact that it is an astronomical observatory, where special work has been done. Make this such an observatory, and by the natural flow of things it would come, in time, to be recognized as the geodesical center of the globe; and all measurements would start from it. Its fitness for this is too great and manifest to make any resistance successful, after the movement towards it shall have been once begun in some natural and appropriate manner.

A part of my idea, and assistant to the main end, is that the Pyramid, and a park around it, should be made neutral ground under the guardianship of all English speaking people, or of all Christian nations, so that war should not interfere with it; and as the spot can never have any strategic importance, this could easily be done.

Such, in substance, is the idea in my mind; and you will easily perceive how important it seems to me, and how earnestly I would seek for action, if there appeared the least hope of attaining the desired end. And now for the letters themselves. In the first one I have omitted the very kind personal references of Prof. Smith, as having no special bearing upon the matter in hand.

15 ROYAL TERRACE, EDINBURGH, SCOTLAND, December 6, 1883.

My Dear Lucian I. Bisbee:—

* * * * *
 But the chief object of your letter is the proposal of Rev. Jesse H. Jones to call men's attention forcibly to the Great Pyramid, by a virtual scientific fire-raising on the top of that remarkable monument of the ages, and of architecture, in the shape of putting an astronomical observatory thereon. * * * * *

Who would not, therefore, join with Mr. Jones in the spirit and intention of his proceeding, if it were practical also?

But this latter point must be considered. And here I should remind you that something very similar was proposed by an ex-admiral, who was superintendent of the Na-

tional observatory at Washington, D. C. But after preparing his drawings of an observatory on the top of the Great Pyramid, he found that human life and residence required roads, lights, drains, water supplies, etc., which would seriously deface the Monument ; and its mere height of 480 feet, more or less, would give no sensible advantage in astronomical observation, but would seriously increase the terrestrial disadvantage of wind-force, against which, and the sand-storms of the desert, some protection is just as necessary, or more so, than it is with us against rain. To have the Great Pyramid enclosed in a people's park, and an astronomical observatory therein, might be more practical. And there is a clergyman at Alnwick, Northumberland, a keen observer, who is just now scheming how he can get assistance and co-operation in taking out his 18-inch reflector telescope to Egypt. and have a season's observing there ; to whom I will venture to recommend Mr. Jones' scheme—to be pyramidal if Egyptian in any degree.

Yours very truly,

C. PIAZZI SMYTH.

Perhaps it is out of place for one, entirely unacquainted with Egypt by experience, as I am, to make any reply to the difficulties raised by Professor Smyth. However, I will risk one remark : he and his wife lived there four months and worked ; and Colonel Howard Vyse lived there seven months and worked ; and a city full of people, many of them Englishmen, live in Cairo, but six miles away ; and " what man has done man may do," is a good old proverb ; and that a telescope, and abundant shelter for it, can be anchored to the top of the Pyramid without defacing it, seems to me plain.

However, hardly had this letter been received by Mr. Bisbee, when another came, or rather two in one, which were as follows :

ST. PAUL'S VICARAGE,
ALNWICK, NORTHUMBERLAND, ENGLAND, December 7, 1883. }

My Dear Professor :—Very many and best thanks for letting me see the enclosed letters, (from Secretary Lucian I. Bisbee and Rev. Jesse H. Jones, Boston, U. S. A.) They touch a subject in which I am, as you know, exceedingly interested ; for I believe that Cairo, on account of the dryness of the climate, affords facilities for astronomical observation unequalled by any place in the world which is available for the purpose. I think very valuable results would accrue from taking a large telescope, such as mine, out there for a season, and in this opinion I am, I believe, supported by yourself and by the first double-star observer in the world, Mr. S. W. Burnham.

As far as I am concerned, my telescope and my services will be at the disposal of the Institute, if they will find the necessary funds for transporting me and it out there and home again. The instrument is, as you know, a silvered-glass reflector of 18½ inches aperture, of the very finest quality, equatorially mounted, and driven by clock-work ; and the double-star work which this instrument has already performed is such that, in the published opinion of Mr. S. W. Burnham, it is capable of doing the most difficult and delicate work in this department of astronomy—which I need not say is far and a way the most severe in testing the quality of an instrument. I have a sidereal clock, micrometer, and all necessary appliances. The only thing required would be a new stand, adapted to the latitude of Cairo. I am, as you know, perfectly acquainted with its management and

working. Being a poor man, I cannot by myself bear the expense of taking it out to Egypt for a season ; but I have no doubt, were the matter taken up by the Institute, several would gladly join in the expedition, and would help to bear the expense. As to transporting it to the top of the Great Pyramid, you are a far better judge than I can be of its feasibility. But knowing how handy the instrument is on account of its short focal length, and the great ease with which all its parts can be transported, as compared with those of a refractor of anything like the same size, I do not see any impossibility in the way. But that is a matter of detail. The first thing is to get the instrument out there and see what results would be yielded by a few months of observation. If they turned out to be anything like what there is reason to expect, the establishment of a permanent observatory out there would no doubt follow in due course ; and what better place could be found than the top of the Great Pyramid, if the idea is practicable ?

Very oddly, your letter reached me only a few hours after I had delivered a lecture in our town hall here on "Egypt, its Pyramids and Ancient Monuments." I take a keen interest in the pyramid question, and I can truly say that I sincerely hope that the convictions at which you and many others have arrived are correct.

If you would kindly send this letter to Mr. Bisbee, together with any remarks you may be good enough to make, and ask him to write to me on the subject, I shall be very much obliged. Of course this season is too far advanced for anything to be done now, but next, please God, the thing may be carried out. With kindest regards to Mrs. Piazzì,

I am, my dear Professor, most faithfully yours,

JEVONS J. M. PERRY.

According to Mr. Perry's request, Professor Smyth immediately forwarded the above to Mr. Bisbee, accompanying it with the following note of his own :

ROYAL OBSERVATORY, EDINBURGH, SCOTLAND, December 10, 1883.

My Dear Lucian I. Bisbee:—I return to the subject of yours and Rev. Mr. Jones' letters of last November ; for my friend, Rev. Jevons J. M. Perry, has responded so immediately and enthusiastically, as see what I now enclose.

To all that, I would only seek to add my testimony, whether official or private, that he is an astronomical observer of the highest acuteness, accuracy and sympathy, by nature ; that the telescope which, by great efforts on his part pecuniarily, he has at last possessed himself of, is really in its way, and with his handling of it, a pearl of great price—a silver-on-glass reflector of eighteen inches aperture—so that, take it and him all in all, his observations with it through a season at the foot of the Great Pyramid, should quite make an epoch among astronomical observers. Now, that is what Mr. Jones and yourself seem to desire to bring about, and the only difficulty is the expense. Is there, then, to your knowledge, any rich man, or any number of men comfortably off, who may be desiring to go to Egypt next winter (1884-5), who would like to be honorably connected with a remarkable astronomical work to be performed there during their visit, and who would win their claim to it by subscribing to the expenses of removing and establishing so large a telescope, and returning it again to its home, if no opportunity of permanent establishment should turn up ? I myself would not think of asking you to press the idea upon any one ; I should be quite content with your launching it at a public meeting, either in Boston or Cleveland, or both, and writing to Mr. Perry direct, if anything turns up.

I remain, yours very truly,

C. PIAZZI SMYTH.

If this matter shall seem to you of sufficient merit, would

you kindly lay it before the next meeting of the Ohio Branch of the International Institute? Very truly yours,

JESSE H. JONES.

To Charles Latimer, C. E.

A REVIEW.

“PYRAMIDS AND TEMPLES OF GIZEH.”—BY W. M. FLINDERS PETRIE.

We sent Mr. Beswick the book of Mr. W. Flinders Petrie for a criticism, and the papers Nos. 1 and 2 are combined in the present article below. Mr. Beswick had not seen Rev. H. G. Wood's paper before writing No. 1, but had seen it after writing No. 2. The reader will see that he endorses generally Mr. Wood's view; also the conclusion of Mr. Wood as to Mr. Dow's formula giving 9139.871 258+ as the base of the south-east socket, which is $\frac{180^2}{2\sqrt{\pi}}$ —[EDITOR.

NO. I.

At length, this important contribution to the literature of what relates to Egyptian archæology and to standard works on the Pyramid, has been published. The materials of the present volume have been selected from the results of two winters' work in Egypt. There is little, or comparatively little, difference between the numerical results now published and those which have appeared in the standard works of Colonel Howard Vyse and Professor C. Piazzi Smyth. This work is really nothing more than supplementary to their prior measurements and descriptions. It gives fuller information about a few of the principal parts of the Great Pyramid, and professes to include a more exact measurement of the whole exterior. The major portion of the book is taken up with matters relating to the second and third pyramids, the granite temple, and other

lesser works, and the methods and instruments used in the investigation and survey.

Our interest in this work is confined exclusively to the chapters relating to the Great Pyramid. Chapter six contains a description of work in relation to the outside of the Pyramid, and gives the materials in detail for the discussion of the original size of the base, the casing, *in situ*, upon the pavement in the middle of each face, the rock-cut sockets at each corner, the levels of the pavement and sockets, and the mean planes of the present core masonry.

The conclusions of Mr. Petrie differ somewhat from those who have preceded him, and these conclusions mainly rest upon his conception that the true datum line, or zero of levels, should be "a considerable flat-dressed surface of rock at the northeast corner, which is evidently intended to be at the level of the pavement." (p. 41.) From this zero point the levels around the Pyramid were taken. His datum line is not the rock-level upon which the base rests, but the level of the pavement which surrounds the base.

Then, again, he claims that the line joining the sockets is not the true base line of the outer casing at the foot of the Pyramid. He says: "I found that the casing on the north side lay about thirty inches *inside* the line joining the sockets.—" (p. 37.) He searched again and again for any flaw in the calculations. All his check measures agreed in the same story, and when reducing his observations to give the mean form of the core planes at the pavement level, it came out thus: mean result, case plane sides, 9001.5 inches in length; socket sides, 9125.9 inches.

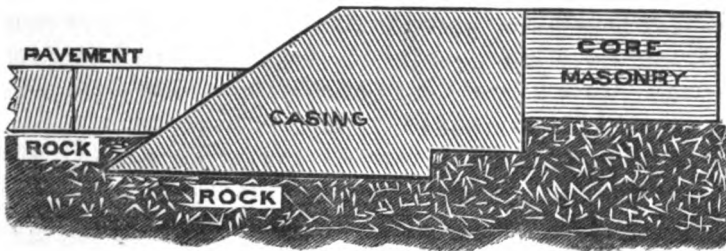
Hence he says: "The sockets only show the size of the Pyramid where it was started from varying levels, which were all under the pavement; and its *true base* upon the pavement is therefore twenty or thirty inches *inside* the lines of the sockets." (p. 38.) The foot line of the casing all round the Pyramid base was *inside* the line of the sockets. His theory is "that it would be natural to allow (a margin) some free space in which to adjust the stone." (p. 38.) He concludes as follows: "The original base of the Great Pyramid *casing on the platform* is of these dimensions:" (p. 39.)

N.	9069.4	British inches.
E.	9067.7	“ “
S.	9069.5	“ “
W.	9068.6	“ “
	<hr/>	
Mean	9068.8	“ “

And in another place, more generally, he says: “On the whole, we probably cannot do better than take $51^{\circ} 52' \pm 2'$ as the nearest approximation to the mean angle of the Pyramid, allowing some weight to the south side. The mean base being $9068.8 \pm .5$ inches, this yields a height of 5776.0 ± 7.0 inches,” (p. 43.)

As the whole of his subsequent results rest upon this fundamental theory of the original base being about 20 to 30 inches inside the socket lines, and the true base length to be measured from the casing line as the level of the platform, it would be well to consider this point at the outset of our review.

There appears to be a fundamental mistake in the assumption that the casing stones all round the four sides of the Pyramid were inside the line of the sockets to the extent of 20 to 30 inches. For on the same page (38) he says: “This means that the sockets *were cut to receive the foot of the sloping face, which was continued right down to their floors beneath the pavement.* (See Pl. XI).”



This single sentence upsets the whole theory. How could the sockets be *cut to receive the foot* of the sloping face, if that sloping face was allowed a margin of 4, 10, 20 or 30 inches? How could the sloping face be “continued right down to their floors” in the socket, if the foot of the sloping face did not come up to the outermost edge of the socket pocket? Mr. Petrie re-

fers to the plate for illustration. Well, here it is. But the foot of the sloping face is *flush* up to the pocket edge of the socket in this diagram, with no margin of 4, 6, or any number of inches. The allowance of space by enlarging the socket for the purpose of adjusting the stone, which Mr. Petrie urges in excuse for this assumption, is simply inadmissible and unreasonable. It might do very well for blundering and unskilled workmen, which the Pyramid builders were not. It might do as a reason for those who did not know where they might have to begin to lay their first corner stones; or for builders who had begun at the center or at the apex of the Pyramid. Then such allowance might be made, and a margin be supposed and rendered necessary. But for men who would begin at the bottom course of the core masonry, and at the extreme edge of the base, we cannot suppose that any margin at all was necessary. In a thousand different ways and places, all over the inside and outside of this structure, we have the most incontrovertible proof that the skilled workmen employed on this building could plan and lay out their work, and execute the same within the one-hundredth of an inch.

Now look at the comparative results. Mr. Petrie obtains a mean length of base equal to $9068.8 \pm .5 = 9069.3$ British inches; add to this the 30 inches at each end, which he has deducted from the socket lines, and we have for length of base $9069.3 + 60 = 9129.3$ British inches. The royal engineers of 1869 gave also 9130 British inches. And Prof. Piazzi Smyth adopted 9130 Pyramid inches = about 9140 British inches. The angle of the sloping sides is given at $51^\circ 52' \pm 2'$. This is certainly a wide margin, and identically the same as given by Colonel H. Vyse, $51^\circ 50'$ to $51^\circ 52'$. Prof. Smyth has adopted $51^\circ 51' 14.3''$. Of course, the vertical height of the Pyramid depends upon this angle of the face. But Mr. Petrie has left the matter in quite as undetermined a condition as it was before his work was published. He cannot tell the angle within $2'$ of error either way, or rather within a range of $4'$ of angle. There is not, on an average, half the certainty about his measurements as there is about those of the Scotch Royal Astronomer.

When we come to the measurements of the passages and

rooms, the same uncertainty prevails there. And when he compares his own results with Prof. Smyth's, in relation to the length of the entrance passage, he says: "On comparing them with Prof. Smyth's measures, it will be found that his measures make the passage length about *an inch* shorter on an average." (p. 57). If this be all the error or difference that a continuous research of two years can discover, then we prefer to accept the measurements of the Scotch Royal Astronomer, until something more definite and reasonable can be offered in objection than what Mr. Petrie has presented in this work.

The entrance passage angle he gives at $26^{\circ} 29' \pm 1'$. In other words, there may be an error either way of $1'$ of angle, or a range of $2'$ of angle. This is very indefinite also. Prof. Smyth gives one of his measured angles, $26^{\circ} 28' 7''$; and Mr. Petrie gives $26^{\circ} 28'$ to $26^{\circ} 30'$. The latter has not introduced any more certainty into our elements than existed before, and his figures do not vary enough to warrant us in adopting them in preference to others. He estimates the vertical height above the ground level, based on the angle $26^{\circ} 29' \pm 1'$ of the mouth of the entrance passage, at 638.4 inches. If Prof. Smyth's angle, $26^{\circ} 28' 7''$ be taken, it will give this vertical height above the rock-level as 638.37 British inches—only a difference of .03 of an inch. Now we have a right to suppose that, in this case, Mr. Petrie used and preferred Prof. Smyth's angle to his own.

We shall return to a critical examination of this work. Its published results have made the measures of Prof. Smyth a thousand fold more valuable and reliable than they were before. There is really nothing to alter worth altering, but what comes within the range of personal errors. And we may now go on with our labors with increased confidence, and with the assurance that the British unit or inch, which the International Society has adopted as its standard, is unquestionably the true inch which the builders and architect used in constructing and erecting the Great Pyramid at Gizeh. S. BESWICK.

STRATHROY, ONTARIO, MONDAY NIGHT.

Charles Latimer, Esq.:—You will see that, in the main, I agree with the conclusions of the Rev. H. G. Wood. We radically differ in our conception of the meaning of the irregular sides of the base, and of the causes of the changes which age has produced in the dilapidations of its structure.

I have not deemed it necessary to cite all the reasons I could urge for the view I take of the original form and lengths of the sides of the base. You will see that I hold the theory that the North and East sides were of the same length originally, and the South and West sides were of the same length originally; or that the S. W. angle was the complement of the N. E. angle. In other words, that the square base of the S. E. socket gives the base side as given by the formula of *Mr. Dow*. The square base of the N. E. socket gives the base as given by the formula of Prof. Smyth, only that British inches give it instead of his Pyramid inches; whilst the square base of the highest or S. W. socket gives the ancient Egyptian sacred year of 365 days.

Use Fig. 2 of Mr. Wood's article to illustrate my article, and you can draw a *chalk figure* to illustrate it at the meeting.

I am under the impression that the Society should, if possible, look towards an American Pyramid Exploration Expedition, by those whom the Society is assured of being favorably disposed, and not like Petrie, who is clearly prejudiced against the idea of the Pyramid being the source of our standard measures. Put it in the hands of a committee to get the matter up, and let them see if something can be done. I can furnish you with costs and expenses of travel and board there, wages, &c.

Yours respectfully,

S. BESWICK.

NO. II.

There is abundant proof in Mr. Petrie's work that the British inch was the only one used in the construction of the Pyramid. There were not two kinds of inches; for when the dimensions of the entire Pyramid are expressed in British inches, the numbers are identically the same as are used to express the radius divided into seconds of arc, being some multiple or fractional part thereof. This is true of the vertical height and length of the base, also heights, widths and lengths of passages and rooms in the interior. And as this is not true of any other unit, the concurrent proof of all these lines of construction in the Pyramid is a demonstration that the Pyramid was designed to represent circular and circumference relations, when expressed in terms of the British inch.

Mr. Petrie's measurements and researches at the Great Pyramid clearly demonstrate that the builders have embodied the astronomical standards of time in this wonderful structure, by which they regulated their calendars for the civil or vague year, and the astronomical or true tropical year. The civil or vague year of 365 days was of more practical use and consequence to the great mass of the Egyptian people than the astronomical or true standard year of 365.2422 days.

From time immemorial the civil or popular year of 365 days was called by them the "sacred year." The oath imposed on

Egyptian Pharaohs, "that they would not intercalate any month or day, but that the sacred year of 365 days should remain as instituted in ancient times," evidently had for its object the employment of both the sacred year of 365 days and the true tropical year of 365.2422 days for a counter-reckoning in present and future records, whilst the oath itself bears testimony that the civil or sacred year of 365 days was instituted in very remote times, for the convenience of civil reckoning. By means of this "sacred year," the priests and the entire nation were enabled, on account of its annual reversion, to carry the same festivals through every season in the year in regular undeviating succession. The Egyptian astronomers were, however, aware of the necessity of an additional quarter of a day, to equalize the standard tropical year with this civil or sacred year of 365 days.

They therefore created a sothic period, consisting of 365.2422 days, as their true standard year. They knew that, as these two years began on the same day, at the epoch of Menes, 2782 B. C., a cycle of 1461 civil years, or 1460 sothic years, must transpire before the same circumstance could occur again. Thus:

$$365 \times 4 \text{ gave civil year every } 1460 \text{ sothic years.}$$

$$365.2422 \times 4 \text{ " sothic " " } 1461 \text{ civil "}$$

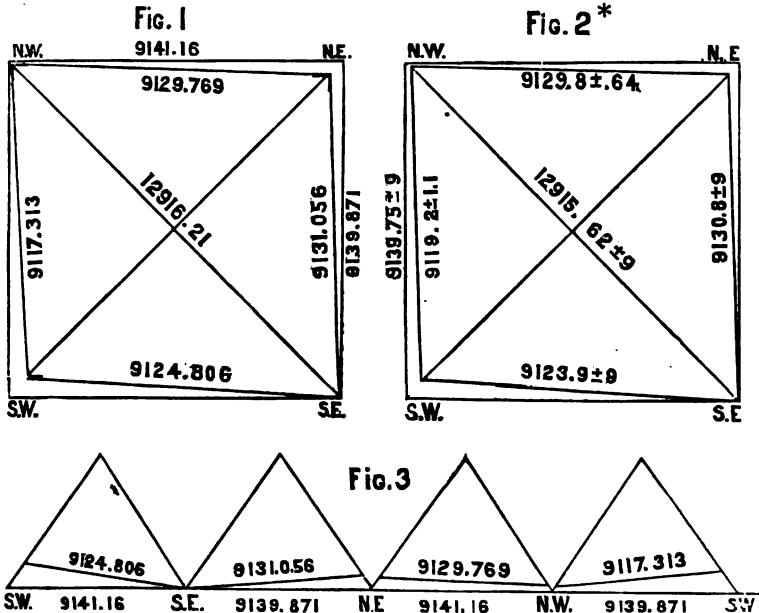
Thus 1460 fixed years were equal to 1461 sacred civil years, there being 533,265 days in each series. Such was the ancient calendar of the Egyptians, even so far back as the epoch when the Great Pyramid was erected, in relation to their two standard years—civil and astronomical. I now proceed to draw some conclusions from the Pyramid itself, in relation to these two standard periods of time.

W. M. F. PETRIE'S MEASUREMENTS.

The four corner sockets of the Great Pyramid were re-examined and remeasured by Mr. Petrie. He was fully aware of the absolute necessity of determining the base lines, if possible, by actual inspection and the best methods; for any conception of its geometrical construction must rest upon the scientific determination of its base lines. The four sockets are cut in the

natural rock at varying depths. Each socket has been leveled with accuracy, but they have not all the same level. The southeast socket is the lowest, then the northwest, northeast and southwest, in the order here named. The lowest datum level, which is the true level, is that of the southeast. The four sockets mark the site of the four corners of the building. And whilst the base is not absolutely a perfect square, it is so little short of being such, that the eye could not detect its amount of deviation.

The enclosed diagram will illustrate the result of what Mr. Petrie has proved, beyond a shadow of doubt, to be the present value of the Great Pyramid's base.



The following are Mr. Petrie's measures :

East socket line,	9130.8
North " "	9129.8
South " "	9123.9
West " "	9119.2
Mean " "	9125.9±.65

* In Fig. 2 the decimal in each case after the plus or minus sign should be .65

with a diagonal from S. E. to N. W. of 12915.62 ± 9 . The southeast is the lowest socket and farthest from the axis of the Pyramid. And if we compute the line of facing which must run from the vertex to the northern base at an angle such as Mr. Petrie gives, $51^\circ 52' \pm 2'$, it will strike the base line at a distance of 9139.87 inches from the southeast corner of the southeast socket. This is exactly what we have all along expected from theory would be the case by actual measurement.

But this is the side of a true square; and the Pyramid is not a true square. Therefore the side is not 9139.87 British inches, but $9130.8 \pm .65$ inches for the east side from S. E. to N. E. sockets. A true square, drawn from this lowest base, would be a square of 9139.87 inches, expressed by the formula:

$$\text{Base} \frac{180^2}{2\sqrt{\pi}} = \frac{16200}{\sqrt{\pi}} = 9139.871258 +.$$

There has evidently been a settling down of the whole south side of the Pyramid in a westerly direction. The north has been little affected, and the east and west. The main warping has been on the southern side of the Pyramid, in a westerly direction. And this is somewhat strange at first sight, because the highest socket and firmest base is at the S. W. corner. We should naturally have supposed that the warping would have been in the direction of the lowest base socket, at the opposite corner in the S. E. The settling, if any, and there was a little, would have been in that direction. But whatever may have taken place in this respect has been the result and effect of a strain from warping exclusively. Warping has been the efficient cause, and settling has been one of the effects. And this warping has been mainly on the south side of the Pyramid towards the S. W. corner.

The fact of its being the highest base proves this; for the rock has its highest ridge running in the direction of the diagonal from N. E. to S. W., and the warping strain has been all from the E. towards the higher ridge of rock at the S. W. socket. In the middle of the S. base line, the rock level is 5.6 inches lower than the northern base; and the middle of the W. base line is 1.7 inches lower than the opposite eastern

thus proving that the warping strain was on the south side of the Pyramid and in the direction of the S. W. corner.

Undoubtedly this result must have arisen from the action of the sun on the southern side of the Pyramid. Its direct rays acting upon this immense mass of masonry for thousands of years, were quite competent to produce this result. And if solar action produced any warping result at all, its maximum effect would be felt and seen on the southern side almost exclusively, for all other minor effects would only tend to follow in the direction of the greatest strain and where the maximum results were taking place. The total effect on the S. side of the Pyramid, from this cause, appears to have been but a few inches in the increased length of the southern base line.

SYMBOLISM OF THE BASE.

I. The four sides of the base are each slightly different in length, so that the base is not a perfect square. There is no doubt a deeper significance yet to be discovered in the arrangement of the side lengths of the base. If we deduct the warping of the southern base to the extent of 3.7 inches, the length will then be 9120.2 inches instead of 9123.9 as given by Mr. Petrie for its present length. The sides will then have the following significance :

N.	9129.8	E.	9130.8
S.	<u>9120.2</u>	W.	<u>9119.2</u>

Mean 9125.0 Mean 9125.0

Or the total value of the four sides of the base will be :

N.	9129.8
S.	9120.2
E.	9130.8
W.	<u>9119.2</u>

Total 36500.0

In other words, the cycle, which is thus symbolically expressed, is clearly that of the sacred year of 365×100 years. I notice in the last number of the INTERNATIONAL STANDARD, p. 499, the Rev. H. G. Wood says: "The sum of the four theoretical socket lines we have presented is 36502.944 inches.

II. The E. and W. sides would be the least affected in their length, and the N. and S. sides would be the most affected, because the warping strain was from E. to W., thereby lengthening the southern base and shortening the northern base by being pulled askew. Mr. Petrie tries to make a point against Prof. Piazza Smyth, in relation to the foot of the casing. He claims the casing line did not come up to the socket, but the line was warped, and the base line more or less pulled from the socket sides. Mr. Petrie's east socket line is 9130.8. The true value is doubtless 9131.05, or about one-fourth of an inch=.25, warped from its true value. He says, p. 40, that there is a small mean error of two-thirds of an inch=.65, for errors of the sockets and triangulation. And one-third of this mean error would change his 9130.8 into $9130.8 + .25 = 9131.05$, which is simply one-fourth of the grand cycle of 36524.22 years, the standard astronomical year of the Pyramid builders, and of the modern astronomers of to-day.

Mr. Petrie makes the N. socket line 9129.8 inches. But the side has been warped by the strain on the southern side to the extent of 1.25 inches—a very small item, and only double the amount of error allowed by Mr. Petrie. The true value of the N. base should be 9131.05 inches. The warping on the N. side being from the N. E. angle westward, the base line would be diminished to the extent of 1.25 inches, and the socket-stone removed that much from the socket side, and the length reduced to 9129.8 inches as found by Mr. Petrie. Prof. Piazza Smyth and Mr. Petrie both found the end walls, east and west of the King's Chamber, tilted .82 inches toward the S. W. angle; thus lessening the northern base line 1.26 inches on the N. E. and increasing the southern base line on the S. W. end.

On every side of the King's room the joints of the stones have separated, and the whole chamber is warped and stretched and made larger. Every roof-beam is broken across the S. side. The massive roof-beams are either cracked across, or torn out of the wall, more or less, on the S. side, and the construction chambers above have sunk bodily towards the S. The amount is but small—an inch or two—but increases in extent towards the S. W. corner, away from the center. The S. E. corner

has warped so badly towards S. W., that the wall is pulled apart and cracked, and a large opening or fissure shows plainly that the strain has been westward from the S. E. These results tell conclusively that the direct action of the solar rays for thousands of years upon the S. side of the Pyramid has expanded and warped this side, which has sustained almost the whole burden of the solar action upon this immense pile of stone, year after year, from the most ancient times.

The E. and N. sides appear to have been originally alike, each being 9131.05 British inches in length, and probably were designed to indicate the standard astronomical year of 365.2422 days, by which the civil, vague or sacred year—known as the civil calendar year—was regulated.

The W. and S. sides opposite thereto, forming the two sides of the S. W. angle, were originally 9118.95 inches in length, and were designed to represent the complement of the opposite sides, north and east, to make up the perimeter, and change the vague civil year of 365 days into the standard fixed astronomical year of 365.2422 days, represented by the two sides of the opposite N. E. angle.

So much for the significance of the actual sides of this irregular base of the Great Pyramid. The actual square base, when drawn out from the S. E. corner base and socket and carried all round the four sides, will afford us some additional instruction. The E. socket-line, measured by Mr. Petrie, is the longest, being $9130.8 \pm .65$. But if only one-fourth of an inch = .25 be allowed, or only one-third of the error of measurement allowed by Mr. Petrie be taken, the true base-line would become 9131.05 inches, or the identical number in British inches that make up the value usually given by Prof. Piazzi Smyth. But extend the line at right angles, and the east line base becomes 9139.871258 British inches.

So with the S. base line. Mr. Petrie, on page 206, gives 9122.5 inches for this line, as given by the Royal Engineers' survey, and in a note he says: "This is stated at 9140. Now the outer W. edge of the socket-block at the S. W. is 17.5 beyond the drawn line which defines the socket, and it is therefore about 9140 from the S. E. corner." So that the base line

of the S. from the outer W. edge of the S. W. socket-block is 9140, or rather 9139.871258 inches also.

And, indeed, this is the actual and true base of the Great Pyramid. The perimeter of a true square base is equal to 36559.485 inches, or 9139.871258 inches to a side. It also represents a circular area with a radius equal to that of the actual width of the King's Chamber, and consisting of precisely the same figures as those which are now used to express the radius of the earth's orbit, divided by 1,000, or $\frac{206264.8}{1000} = 206.2648$.

This foundation or datum line, formed into a perfect square, is that which springs out of the S. E. socket-level, the lowest in the Pyramid.

The datum line of the N. E. socket-level, which is 11.4 inches higher, would give a square base equal to 36524.22 inches, forming the true astronomical standard year. We may now see that there was no necessity for the use of two kinds of inches.

The datum line of the S. W. socket-level, which is 16.9 inches higher than the S. E. socket-level, would give a square base of 36500 inches, with sides whose length would be 9125 inches. The square of this S. W. base would represent the civil or sacred year of 365 days, which every Egyptian Pharaoh was compelled to swear, at his coronation on ascending the throne, that he would preserve it in all its ancient integrity.

In conclusion, taking the work of Mr. Petrie for a complete and honest record of actual and careful measurements, made on the spot by a competent civil engineer used to the instruments necessary for the work, and extending his measurements over all the points required for a complete settlement of the many vexed problems which have been raised and formulated since Professor Piazzi Smyth was there, we cannot express our thanks too warmly for the complete opportunity his work has given of vindicating the Royal Astronomer of Scotland in relation to his measurements and the main elements of his theory of the Pyramid, and the skill and wonderful science of ancient times.

P. S.—To be a little more explicit, I would say that the ob-

ject which the builders had in view in making the two sides of the N. E. angle equal in length, and the two sides of the S. W. angle also equal in length, was:

(a). Geometrical. It was so built that its *height* would be to *one-half* its circumference, as diameter is to circumference of a circle.

(b). The height would be to the two sides of the N. E. angle as $5813+$ is to $9131.05 \times 2 = 18262.10$, giving a year of 365.2422 days.

(c). The height would be to the two sides of the S. W. angle as $5809+$ is to $9125 \times 2 = 18250$, giving a year of 365 days, and better known as the sacred or civil year of the Egyptians.

So that the Great Pyramid not only embodies in its geometrical structure a method of quadrature, but the actual values of the two standard measures of time, known as the civil or popular sacred year of 365 days, and the astronomical or standard fixed year of 365.2422 days, used for chronological and scientific purposes. By this geometrical structure of the base, the architect has settled the disputed point which has long disturbed the ranks of the Pyramidists in relation to the use of two inches by the builders. The architect has given the standard year of 365.2422 days in British inches only, and has devoted the N. E. angle and its two sides to the measurement of its value, whilst the S. W. angle and its two sides have been also given in British inches for a sacred year of 365 days, then in popular use. And the ancient Egyptians were content with this one invariable, natural and convenient standard in the reckoning of time, and by their adoption of this historical and official year of 365 days they have afforded the only example of a practical chronology, free from all obscurity or complication.

In the Rev. H. G. Wood's excellent article on the "British Mile," which appeared in the last number of the INTERNATIONAL, pp. 497-498, appears the following passage: "The south socket line, 9124.806, would strike the southwest sloping corner at the level of 20.82 inches above the southeast socket floor, and the north and west socket lines, 9129.769 and 9117.313, would

meet in the northwest sloping corner within one inch of each other. Mr. Petrie gives 16.9 for the difference of level between the S. E. and S. W. sockets. *Here is a discrepancy of four inches between fact and theory.* Our theory would imply a settling of the S. W. corner to the amount of this discrepancy."

There is a discrepancy of 3.92 inches it is true, and Mr. Wood is perfectly correct in saying that the south socket line would strike the S. W. sloping corner at the level of 20.82 inches above the S. E. socket floor. But I would suggest that he is not correct in his theory, that this discrepancy between Mr. Petrie's 16.9 inches and Mr. Wood's 20.82 inches implies a settling of the S. W. corner. There has been no settling in the foundation—none whatever. How will you explain the difference if there be no settling? In this way. To make up this difference all the levels of the courses on the S. W. corner are about an average of from 3 to 4 inches higher than the S. E. and the N. E. corners. Take the six uppermost courses as they now stand for an illustration:

N. E.	S. W.
5407.9	5409.2
5385.7	5386.8
5362.9	5364.3
5341.3	5342.9
5319.2	5320.9
5295.7	5298.2

The S. W. courses of the angle are really higher on an average to meet the case cited by Mr. Wood, and to make up the small difference he suggests. Had there been a settling of the S. W. angle of about four inches, *the levels of the courses forming the angle would have shown it.* But instead of being of a *lower* level the courses of the S. W. angle are actually *higher* by the average amount of the difference suggested. The fractures, cracks and displacements in the Great Pyramid are the result of *warping* by the action of the sun on the south side and south-west angle, and not of settling. Had there been a settling of the S. W. corner, all the courses in the angle would have had a lower level than the S. E. and N. E. courses instead of a higher

level, as we now know them to have. This fact is conclusive, we think, if Mr. Petrie's figures are reliable.

S. BESWICK.

THE FIRST MERIDIAN AND THE METRIC SYSTEM.

At the last sitting of our Academy of Sciences, Mr. Faye communicated his principal decisions adopted at the session of the International Geodesic Association, assembled at Rome last October with the friendly and courteous support of the Italian Government. The conference had added to its usual programme the questions broached of the day :

1st. The unification of the meridian of departure (starting-point) for geography and navigation.

2d. The propagation of the metric system lacking the positive support of some great powers (England, America, etc.) After having accepted for first meridian that of Greenwich, the conference expressed the desire that the universal time (hour) should not be the civil time, but the astronomical time of Greenwich. It desired to mark the longitudes of 0 a 24 towards the east, and requested that prescriptions should be introduced and explained in the public schools, under the same title as the metric system. This last desire of Mr. Faye's amounts here to enthusiasm.

A high sense of sincerity in this regard animated all the members of the conference, and it was a striking spectacle to see the civil and military representatives of almost all the civilized countries of the world rise under the arches of the Capitol to address to England, and of course to France, the following invitation :

“ The conference hoped that if the entire world should agree upon the unification of the longitude and hours in accepting the meridian of Greenwich as point of departure, Great Britain will find a motive on her side to make a move in favor of the unification of weights and measures in adhering to the Convention of the Metre of May, 1875.” Let us say in the first place, that the reasoning of Mr. Faye offends by its base-

ness. What! has France been so completely vanquished in two important points? The conference rejected its first meridian, which, with us, in the words of Mr. Faye, is connected with immense works with secular traditions which, so to speak, form part of the scientific individuality of France. In the second place, the conference adopted for the universal hour the astronomical hour of Greenwich, while in France, the astronomers themselves, at the time when the Republican Calendar was instituted, had adopted the civil hour, the hour of the whole world. With these two defeats Mr. Faye can now hardly expect that England and America—nations full of good sense—will adopt the French metric system—the most incredible of revolutionary extravagances. The metre, it would appear, is the ten millionth part of the quadrant of the meridian; but the meridians are always unequal, because the earth, according to the forced admission of the astronomers, is not a regular ellipsoid, and it has even been demonstrated that in Prussia the shape of the world is very irregular. The ten millionth part of the quarter of the meridian then means nothing; and to give it a meaning, it is necessary to add that the quarter of the meridian mentioned is the meridian at the Belearic Islands. And why Dunkirk? Besides, the measure of this arc of meridian is a colossal operation, and requires a long and laborious triangulation, entailing enormous expenses, and impossible to bring to close calculation without error; and as a fact, the length of the metre deducted from the triangulations between Dunkirk and Fenneentun displays a notable error. It would seem to be the animus of Republics to construct at great cost immense levers to raise a straw. It would have been far easier to take for unit of measure the length of pendulum and seconds at a given longitude or latitude. Besides, to substitute for the system of ancient measure something so abstract, so transcendent as the metre is against all the traditions of humanity—a necessary consequence of the revolutionary spirit carried to absurdity. Moreover, the metre is a measure entirely too vague, which it is impossible to handle without deforming, even when it has been constructed in hard metal—lithrage (?) of platinum is generally adopted by the International Commis-

sion of Weights and Measures—a Commission whose long labors cost France much to arrive at nothing, as Mr. Faye himself acknowledges. It is time; high time, that a blow fatal to the metric system should be struck, and that it should cease to exist, like many other outgrowths of the Revolution; and that the unit of measure, adopted by the whole world be that of the Grand Pyramid, not a decimalized curve pretended to be equal to the ten millionth part of the quarter of the meridian essentially variable, but to the ten millionth part of the semi-polar axis of the earth, a grand cosmical unit and especially the same as that of Moses and Solomon.

F. MOIGNO.

THE MOON'S MEAN PERIOD, AND THE ANGLE OF
ASCENT OF THE GRAND GALLERY
OF THE GREAT PYRAMID.

In the course of my Pyramid investigations, I obtained, some time ago, the following equation for the moon's mean synodical period, e representing the earth's equatorial diameter, and 36525.95983 being 100 times the length of the anomalistic year in mean solar days:

$$\sqrt[4]{\frac{7e}{36525.95983 \times 40\sqrt{2}}} = 29.5305882 \text{ days.}$$

This equation may be put into the form,

$$\frac{4e}{\pi\sqrt{2}} \times \frac{7\pi}{\sqrt[4]{36525.95983 \times 160}} = \text{moon's mean period.}$$

The first factor, $= \frac{4e}{\pi\sqrt{2}}$, the diameter of a circle having a circumference equal to the sum of the sides of a square inscribed in a circle whose diameter equals the equatorial diameter of the earth.

The second factor, $\frac{7\pi}{\sqrt[4]{36525.95983 \times 160}}$ resolves itself simply into the square of the sine of an angle of $3^\circ 41' 24''.82$, which is so close an approximation to the difference between the lati-

tude of the pyramid, $29^{\circ} 58' 51''$, and the mean of Prof. Smyth's measures of the angle of ascent of the Grand Gallery $26^{\circ} 17' 28.3''$, as to leave little doubt that the true angle of ascent is very nearly, if not exactly, $26^{\circ} 17' 26.18''$, or only $2.1''$ less than the mean of Prof. Smyth's measures. It became, therefore desirable to ascertain, if possible, whether the true angle of ascent could be determined independently from the Pyramid measures, or from the dimensions of the earth as derived from these measures; and ultimately it was found that if a = the area of a section of the earth through the polar axis, d = the mean diameter of the earth, and d' , = the diameter in the latitude of the Pyramid, then $\frac{\sqrt{a}}{d+d'} = \text{sine of } 26^{\circ} 17' 26.18''$, or less than three-tenths of a second of arc greater than the value obtained from the equation for the moon's mean period.

The dimensions of the earth used in the calculations were :

Polar Diameter, 7891.4141 P. miles.
 Equatorial, 7918.0138 " "

The latter number differs 0.0036, miles or about 19 feet from the value given in my paper, "The Great Pyramid and the Dimensions and Figure of the Earth," in the *Banner of Israel*, No. 318, p. 52, and was obtained by the use of the following equation :

$$\frac{1}{40 \sqrt{412.1318893}} = \frac{1}{297.6725} = \text{ellipticity of the earth's figure.}$$

It will be seen that in this equation I have employed the corrected length of the King's Chamber given in my communication at page 346 of the INTERNATIONAL STANDARD, and I may here remark that the two equations on the same page may be better expressed by substituting the length of the chamber in original British instead of Pyramid inches, and by reducing the + 2 in the first equation to + 1 and striking out + 1 in the second equation.

JOSEPH BAXENDELL.

December 11, 1883.

RESEARCHES FOR THE ARMY OF PHARAOH IN
THE RED SEA.

This glorious undertaking, which has already attracted the attention of the whole civilized world seems to become more and more probable every day. The chief point was to determine exactly the course pursued by the Hebrews in their exodus, and the precise point of their entry into the Red Sea. The excavations recently undertaken by the English Society for Explorations in Egypt have already confirmed in many respects the learned study of M. Le Cointre. In discovering the city of Pithon, says Mr. Manitto, the learned professor of Geneva, in his reports, one of the most interesting spots of Biblical history was found. In discovering that Pithon and Socutep are really but one and the same, a well settled point was established in the itineracy of the exodus, and the question of the true direction leaves the realms of conjecture and becomes a reality. In discovering that Pithon was built by Rameses XIV. is found the name of Pharaoh, the grand constructor who oppressed the Israelites to use their labor. In this way is established the first synchronism between Biblical tradition and Egyptian history. In continuing its explorations the society found at the same time the ruins and exact position of Pi-ha-Hiroth and Beelsephon and all doubts concerning the journeyings of the Hebrews will disappear, and the opinion of Mr. Le Cointre, so natural and well founded, will be deprived of all objections.

In the second place, the cutting, to-day admitted in principle, of a second Suez Canal, a canal which will inevitably be excavated into the Bitter Lakes, will necessitate excavations which actually place in evidence the army of Pharaoh without its being necessary to organize a special enterprise, which would require considerable capital. I spoke on this matter to M. de Lesseps and received from him very favorable promises. This coincidence appears truly providential, and I have reason to believe that my project, so strange at first, is a happy inspiration.

Finally the American International Institute, whose chief aim is to bring to light the treasures hidden in the Great Pyramid of Gizeh, writes me, through their indefatigable president, Mr. Charles Latimer, that they are on the eve of organizing an expedition to Egypt, of savans, charged to study better than has ever been done heretofore that incomparable monument, for so long a time regarded as one of the seven wonders of the world, and to take anew innumerable measurements—already taken by Mr. Piazzi Smyth, with so much care—and also to include in their programme other discoveries suggested by me.

F. MOIGNO.

NEW MEASURES OF THE GREAT PYRAMID BY A NEW MEASURER.

DESCRIBED BY C. PIAZZI SMYTH, ASTRONOMER-ROYAL FOR SCOTLAND.

PART I.

ON being recently informed by a friend that Mr. Flinders Petrie's long-expected book on the Great, and other, Pyramids in Egypt was out at last, I not only sent for a copy of it,* but ordered one at the same time from Mr. R. A. Proctor's lately compiled volume, entitled "The Great Pyramid." The latter work arrived first, and I opened it immediately, especially to see what could possibly have formed the ground of its author's serious accusation, which I had heard of already from several sides, to the effect that I, a public officer of Government, had discredibly brought out results for the Great Pyramid, "by what school-boys call the method of fudge." The book, however, has no index; its table of contents is comprised in twelve lines, and though I read till I was wearied in the mass of got-up printed pages which follow, it was not my fortune to alight on the indictment alluded to, nor to learn anything new and really true about the Great Pyramid. But I did learn not a little about Mr. Proctor's overweening notions of astrology, and the extraordinary assurance with which he can charge upon others the holding of religious, or rather most anti-religious, opinions which they have never given utterance to, and consider extremely offensive. In short, the book is mainly Mr. Proctor publishing himself; and who can prevent him doing that?

But Mr. Flinders Petrie's book proved, on its arrival, to be a very different affair; far larger, more closely printed, full of figure-work and most original diagrams, and containing the quintessence of many years of hard labor; first, in silent preparations of instruments, books, literary knowledge, and mechanical experience; then in two seasons' active work at the Great Pyramid itself; and lastly, in as long a period of arranging, theorizing on, and printing the chief results of his almost innumerable measures in line and angle, interspersed with antiquarian disquisitions and Egyptological interpretations of a very advanced order indeed.

*The Pyramids and Temples of Gizeh, by W. M. Flinders Petrie, Field & Tuer, London.

The battery of scientific measuring instruments which he took out with him was more extensive than anything before known in that region, and had been in large part prepared for the occasion by his own hands, with an acuteness and manual dexterity which cannot be too highly commended; while his subsequent use of the apparatus at the Pyramid, and his quickness in detecting minute errors in the work of the ancient Pyramid builders is clever, clever, oh! exceedingly clever. Immense advantage, therefore, can hardly but accrue to our knowledge of the Great Pyramid by what he has been doing. It is, in fact, the very outcome with time which I have been longing for ever since my own work there in 1865. And if my measures then were more numerous and detailed than those of most of my predecessors, it is exactly as it should be now, after fifteen years interval, when a smart young scientist, blessed with easy money—means, and abundance of leisure, as having no professional occupation, follows me in all my steps, even to living in a tomb on the Eastern side of the Pyramid hill; exactly, I say, as was to be expected and desired, that his measures should be far more numerous, more minute, and in some points more accurate than mine. Many of his figures, therefore, I accept at once with thanks, whether in addition to, or in place of, mine; and if there are others where I still prefer my own observations, I shall not attempt to defend them in the present place; but hasten on to say and set before the *Banner* public how the Great Pyramid's so-called sacred and scientific theory looks, when examined by the light of these latest mensurations just taken by a very, very sharp individual; and who now seems, both outwardly and inwardly, to rejoice in thoroughly disbelieving the said theory, and even considers he has killed and buried it all!

For the further discovery of the truth, this latter feature of the new authority is of inestimable advantage to others, whatever it may be ultimately to himself; and can by no means be lost sight of. Wherefore, although Mr. Flinders Petrie now bows to the community, *first*, as bearing the surname of his eminent father, Mr. Wm. Petrie, the discoverer of the grandest addition yet made to John Taylor's Hebrew-sacred, anti-Egyptian theory of the Great Pyramid—*viz.*, its reference to, and measure of, the sun's mean distance from the earth; and *second*, as the author of two treatises—one on "Inductive Metrology," and the other on "Stonehenge"—it is to be regretted that he did not also acknowledge himself to be the author of a certain 'Diagram of the Great Pyramid,' much advertised in and about 1877. For thereby *Banner* readers would have been prepared for much of the method of the present book: as they have by no means yet forgotten how they innocently purchased the said 'Diagram,' expecting from the specious terms of its announcement to find there a full demonstration of the truth and latest developments of the John Taylor Pyramid theory; but, on unrolling it, found an interior title setting forth that its object was, on the contrary, to show that "the Great Pyramid's passages are *not* chronological, or not as taught in the so-called time-passage theory."

The spirit of that commencement on the Great Pyramid subject seems to have gone on intensifying in the young author's mind with the years that followed, until in his present book one looks in vain for any trace of respect for Scripture insight into early human history, though finding extraordinary veneration for almost anything inscribed by idolatrous Egyptians; and remarkable aptitude, too, for entering into such matter and discussing it on equal terms with the highest of the modern Egyptologists themselves. Let us hasten, however, to see, first, how the *exterior* of the Great Pyramid looks by the light of this new authority.

OF THE SHAPE OF THE GREAT PYRAMID.

The first point for practical knowledge touching any regular Pyramid is its shape. That is wrapped up in the expression for the one angle of each of its sides; and there John Taylor's deduction for the Great Pyramid from Howard Vyse's measures remains untouched. For Mr. F. P. declares his own direct measures of it to give, with remarkable certainty, for the angle of rise of its sides, $51^{\circ} 52' \pm 2'$; and this includes John Taylor's π angle, while it excludes all the other principal Pyramids of Egypt so far as Mr. F. P., or any one

else, has measured and remeasured them. There is not, therefore, known a single other Pyramid throughout Egypt which has the same angle of shape as the one and only Great Pyramid; and that an angle profound in its meaning through pure mathematics and practical physics as well. Said angle was also constructed at the Great Pyramid with a degree of perfection and solidity in the "casing-stones" which cannot fail to draw the respect of all well-educated and good scientific men; for, says Mr. F. P. (fully confirming thereby the praise of Colonel Howard Vyse, long since published):—

"Several measures were taken of the thickness of the joints of the casing stones. The Eastern joint of the Northern casing stones is on the top .020, .002, .045 (of an inch only) wide, and on the face .012, .022, .013, and .040 (of an inch) wide. The next joint is on the face .011 and .014 wide. Hence the mean thickness of the joints there is .020; and, therefore, the mean variation of the cutting of the stone from a straight line and from a true square, is but .01 on a length of 75 inches up the face, an amount of accuracy equal to most modern opticians' straight edges of such a length. These joints, with an area of some 35 square feet each, were not only worked as finely as this, but cemented throughout. Though the stones were brought as close as 1-500 of an inch, or, in fact, into contact, and the mean opening of the joint was but 1-50 of an inch, yet the builders managed to fill the joint with cement, despite the great area of it, and the weight of the stone to be moved, some 16 tons. To merely place such stones in exact contact at the sides would be careful work; but to do so with cement in the joints seems almost impossible." In fact, there never were such casing stones as these, so large and so marvellously accurate, erected anywhere else, whether in Egypt or any other land, either before or since; while to contrast them, the earliest positively known examples, with the casing stones of any of the subsequent Egyptian Pyramids—miserably executed at last—must cut most poignantly to the heart all the advocates of progressive development among the rationalistic philosophers of our day.

NEXT OF THE SIZE OF THE GREAT PYRAMID.

And here Mr. F. P. has something very new; for one of the two widely diverse lengths for the base-side which he brings out, is far shorter than any that has appeared yet from the researches or measures of all other persons, being only 9069 British inches (p 39). This short length has been obtained by his being the first to refer to the surface of a certain raised pavement, a portion of which is openly visible on the north side, while similarly elevated portions on the other sides are supposed to have been sounded by sinking temporary narrow and dangerous holes down through the huge rubbish heaps lying upon these sides; and the natural consequence of measuring a Pyramid with sloping flanks on a higher level is, of course, to get a shorter base-side length than those who measured it at a lower level.

Now such a lower level is authoritatively offered at the Great Pyramid by its four corner sockets sunk into the rock; and ever since John Taylor's happy identification of the passage in Job. xxxviii. 6 (marginal translation) with the building of the Great Pyramid, the majority of explorers have been firm in maintaining that the socket-defined corners of the base are the architect's fiducial points for measure. Measuring, therefore, upon them, but always under extreme and gratuitous practical difficulties, different persons have obtained varied quantities, between 9,110 and 9,168; while Mr. F. P., measuring with greater accuracy, confirms their honesty by arriving at 9,126 British inches.

Of the two lengths, therefore, which he now gives, suppose, for the purpose of comparison with all mere mundane pyramids, we take the shorter, which is the shortest possible to be attributed by any one to the Great Pyramid—viz., the pavement-surface base of 9,069 inches. Then, as the second pyramid only claims a base-side length of 8,475 inches (p. 201), and all other known pyramids fall rapidly below that, the Great Pyramid is left the *facile princeps* of all human architectural creations of that kind.

But for grander comparisons of the Great Pyramid with nature, we can take no other

than the socket-defined base-side length; and that, according to Mr. F. P., is 9,126 inches long. How, then, does such length answer to the theory commenced by John Taylor?

That theory for the last fifteen years has claimed three illustrations—*vis*: (1) The number of days in a year, in terms of a standard of linear measure, of a length equal to one-ten-millionth of the earth's semi-axis of rotation. (2) The elder William Petrie's magnificent theorem of the Pyramid-sehwn sun-distance; and (3) The diagonal representation of the cycle of the precession of the equinoxes, at the rate of an inch for a year. Not that any person thought that one and the same exact number or length could express each and every one of these three different things perfectly, but that they all converged so closely as to lead, in conjunction with other features of the building, any properly regulated and instructed mind to believe both the triple indication to have been intended, and to have been made practically suitable to each case by small additions or subtractions to the one grand and over-all 9,126 base-side length. Now there are precisely such differences—well attested, and which no Egyptologist has yet explained—between one socket and another, in both shape and size; differences, too, quite large enough to cover all the errors which modern science might be inclined to suggest in the Pyramid numbers for each of the three presentations.

Whether such a use was really intended by the supposed divinely inspired architect, in a primeval age, it is out of our power to ascertain positively now; but the following little illustration may be picked up on page 206 of Mr. F. P.'s new book, showing the power of the sockets to effect such adaptations; for there we read that, whereas the R. Engineers in 1874 did measure the South side of the socket-base of the Great Pyramid and publish it as 9,140 inches long, he, venturing to consider that the socket mark they measured from was not the right socket mark for that purpose, subtracted 17.5 inches from their measure and republishes it as 9,122.5 inches only!

But we may readily excuse a little deficiency in these more recondite details, in reward for two, if not three, excellent things which Mr. F. P. has performed, touching far larger questions of the Great Pyramid, and most violently disputed hitherto by both Egyptologists and rationalists, touching its age and place with reference to other Egyptian monuments, and also its astronomical emplacement.

To all those who hold John Taylor's views, and have recognized in the "sudden, as well as earliest, appearance" in history of the best and mightiest building throughout Egypt a something quite different from the unassisted ordinary course of human progressive development—a severe blow and dire discouragement were administered a few years ago by M. Mariette Bey and other Egyptologists when they announced the discovery of a most ancient hieroglyphic tablet, setting forth that that biggest of idols, the Sphinx, was far older than the Great Pyramid; and that the latter building was devoted in its origin to the worship of Isis, Osiris, Khem, Bast, and all the rankest idolatry of the latter days of ancient Egypt. The disturbing tablet was accordingly set up with all honor in the Khedive's museum at Boolak, and influenced doubtless the minds of many European visitors.

But on his pp. 156-7, Mr. F. P. relates that by aid of further excavations on the pyramid hill, at the same ruined building where the first inscription was found lining the walls of an interior room, others have been met with, showing indubitably that they were all the work of King Petukhanu of the twenty-first dynasty, or 1,500 years at least after the building, completion, and sealing up of the Great Pyramid, near the beginning of the fourth dynasty; that they are of no authority for any earlier time than their own; that no trace of a Sphinx in statuary, tablets, or inscriptions is to be found in any of the genuine remains of the old empire, or on anything until the Hykses period, say of the tenth or eleventh dynasties; and that these Boolak museum inscriptions are modern concocted stories wretchedly scratched into stone, "a degradation," he says, "of the decadence of

the twentieth," for the merely mural decoration of a small temple of the usurping twenty-first dynasty.

Mr. F. P. does indeed also most frankly admit that when Cheops (Khufu or Shofu) of the fourth dynasty began his unequalled "Great Pyramid," the hill of Gizeh was bare and unoccupied by any building. He had the free choice, therefore, of that hill's top, and it was the most striking site presented for a grand monument by all the line of country for leagues and leagues on that side of Egypt. This must have been especially the case for the Northern precipitous brink of the hill, close to which Khufu laid the foundations of his monument. All the other subsequent Gizeh pyramids had therefore necessarily to be built to the southward of his, a circumstance which has led many writers to enlarge on northerly position indicating superior age amongst pyramids.

One notable exception, however, existed to this theory, in the so-called pyramid of Abu Roash, N. N. west of the Great Pyramid by a good many miles. That was a most patent fact to everybody, in so far as something like a commencement of a pyramid was certainly visible there; but if only a commencement, then, argued many persons, that mere flat pedestal could not be called either logically or mathematically a pyramid, and did not interfere with the Great Pyramid being the northernmost of all the real pyramids of Egypt. But Mr. F. P. ingeniously overturns that argument by further facts, and yet brings them to bear, and still more powerfully, towards the same end as before.

By examination of the ruins, or remnants, rather, he deduces that that Abu Roash pyramid must have been completely finished as such in figure, cased with granite, and furnished with a sarcophagus, mummy, and statue of a king, but of one who was not only *later* than Cheops of the Great (or first) Pyramid, but subsequent to King Mencheres of the third pyramid of Gizeh. He was, in fact, King Men-ra; and who, objecting to build a fourth pyramid at Gizeh, because, if in the line of the first, second, and third, it would have been off the hill southward, struck out in a new quarter, on the high land in the northwest, now called Abu Roash.

But it proved somehow to be the worst place that ever man chose to build his would-be immortalizing monument upon; for, from a very early period of Egyptian history, that unhappy building became the object of the most inveterate attack and despoil (see Mr. F. P.'s pages 140—142, 151, 152). The granite casing was stripped off, broken to pieces and carried away; the core masonry pulled to bits and removed; the carefully lined chambers, the granite sarcophagus and the diorite statue were all turned out into the open. "Everything," says Mr. F. P., "has been smashed with the greatest care. The wrought granite has been mainly burnt and powdered, and the surfaces of the statue were bruised to pieces before it was broken up, with a vehemence of destruction, and patient, hard-working vengeance" which it is difficult to account for. Through the times of the Ptolemies the wrecking went on, and is even being prosecuted still "at the rate of 300 camel loads a day during the season;" until, of an ancient pyramid more than 300 feet broad at the base, almost the entire substance has been bodily removed. And in a very few years more the Great Pyramid on its hill of Gizeh will look forth over the expanse of the delta northward, without even a shred of a rival, even of a subsequent age, to dispute its pre-eminence in that world's surface central position it fills so well, and has filled so long.

Some persons have indeed attempted to connect the Great Pyramid southward and backward with the smaller and later pyramids on the Gizeh hill by imagining a concerted scheme of exact geometry amongst them; but Mr. F. P. shows (page 125) by most careful measures that the angles and distances have no regularity or exact relations; and that "from the nature and appearance of the ground, and the irregularity of the peribolus walls, it would not seem likely that any connection had been planned."

But with respect to the astronomical emplacement a most remarkable result is brought out. I had already set forth that there is a defalcation in the latitude of the Great Pyramid, as required by theory and given by observation; and that it would imply a change in

the same direction, and not greater in amount with the time, than a certain minute alteration of a not very clearly or as yet generally acknowledged kind, that must have been going on during the last hundred years in Europe, *teste* the Royal Observatory, Greenwich. Also that there is an error of something like 5' in the orientation of the socket lines and passage planes of the Great Pyramid, which may have its explanation in the same way by a slow movement of the axis of rotation of the earth. But the idea was scouted fifteen years ago by the great mathematical physicists of our time, who had proved the fixity of the earth's axis of rotation within itself "to be equal to the stiffness of hammered steel;" while rationalistic scientists pointed with delight to the demonstration they said I had myself furnished, that the Great Pyramid hill, not being in the required latitude, divine inspiration could not have had any hand in planning and procuring the erection of that building; for God, added they very confidently, would have taken care to provide a hill in exactly the right place, and not have been content to use one which was merely the nearest to it.

Yet now Mr. Flinders Petrie remarkably confirms and extends my view, that though the hill is not in the required latitude now, nor the building correctly oriented by full 5' of angle, yet both features may have been correct at the time of the Pyramid's foundation, to at least 12" of space, or a smaller quantity than is usually reckoned visible to the unassisted eye; and he even ventures (page 127) to approximately compute the force of unbalanced ocean currents which are at work at this very moment, and finds them sufficient to produce the effect observed. Wherefore here, through means of the Great Pyramid, is brought into view a slow movement of the earth's axis of rotation, which modern science ought to have discovered of itself long ago, and will have very soon to make some remarkable confessions about.

Enough, however, at preseat of the *exterior* of this most unique building; for its still more important *interior* under the same new light illumination awaits us.

(*To be continued.*)

GENEALOGICAL STONES IN THE GREAT PYRAMID.

How far the Pyramid can be fairly accepted as an exhibit of standard weights and measures is a question that may not be settled in the present generation without a most vigorous prosecution of its study. Were the question only a problem of curious inquiry as to the degree of scientific knowledge attained by its builders, the practical spirit of our day would be slow to see wisdom or profit in the labor. But already enough has been developed to arrest, if not logically controvert, the commonly received opinion that the huge building on the border of the Lybian desert is only the mouldering head-stone of a dead king.

In the midst of theories fanciful or true, a man comes back from a two years' investigation of it who appears to have no

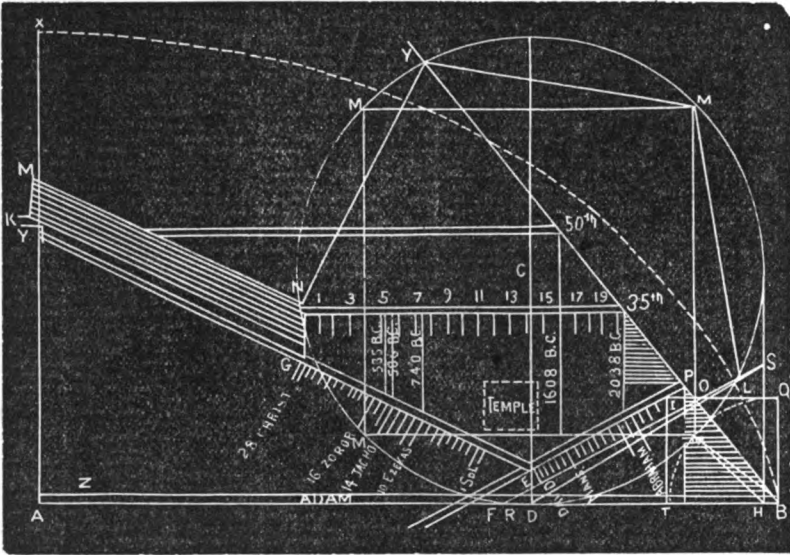
sympathy with them that think they can see evidences of religious thought and historic detail in the arrangement of its stones and structural lines. His facilities for accurate measurement exceeded those of any of his predecessors. We may therefore be quite sure that the results he gives were not gathered for the support of religious fancies. His work is purely scientific. It is not designed to exhibit the intentions or chief purpose of the architect. It simply shows what knowledge of geometry, what constructive genius and exquisite skill men had 4,000 years ago.

So far as Mr. Petrie's measures are correct, they must prove of great service in any theoretical investigation of the original purpose of the Great Pyramid. His allowance for errors of triangulation, etc., leaves abundant room for speculation. His measures confirm with mathematical exactness the opinion held by Pyramid students that the side of the base plane of the Pyramid is within a small fraction of 9140 inches; that its extreme height is very nearly 5819 inches; that the mean angle of its passages is $26^{\circ} 19' \pm 40''$ and that the mean altitude of its sides is $51^{\circ} 51' 14''$. Many other of his measurements are available in the support of theories. What theories have been constructed out of pyramid measures we need not pause to rehearse. What we desire especially here is to draw attention to the fact that the latest and most extensive measurements made of the Great Pyramid abundantly strengthen the belief that the lines, proportions and relations of the various parts of the huge structure have a meaning worthy of careful and laborious study. It has been called a "Book in stone" and it appears worthy the title.

Strong evidence has been given to show that it is an exhibit of the earth's measurement, its equatorial diameter and polar axis. Strong evidence has been given to show that it represents the size and form of the earth's orbit, and the time of its annual revolution around the sun. The date of the building appears to be recorded in the mean altitude of its passages. The question, to what extent is time represented in the details of the structure, is open. Certain coincidences of years and measures cannot be denied. They are facts, whether the coin-

cidences were designed by the architect or not. The lines and proportions are closely and unmistakably related to geometry, geology, astronomy and chronology, whether purposely or by chance.

The following scheme or system of coincidences is offered in the hope that if the Pyramid is really a book in stone, some one may be found to interpret the stones according to the facts of history.



The long curve BLX in the diagram is a cycloid. It is traced by a point in the circumference of the circle, as the circle is rolled along the base line BA. Its length equals $2AX = 5818.8$. BA equals one half the circumference of the circle $= 9139.871 \div 2 = 4569.98$. AD $= 29^\circ 58' 42''$ of the circumference of the circle multiplied by 2. I is distant from B horizontally, 670.2 inches $= HM + HB$, and vertically 652.94 inches $= BM$. $EI = (10p)^2 = 986.96$. $EG = (100p)^2 \div 8^2 = 1542.12$. $GV = 600p = 1884.9$. The angle YBA or slope of the Pyramid is $51^\circ 51' 14.3''$. The altitude of EI and EV is $26^\circ 19' 34''$ the original slope, we believe, of the passages.

The levels above the base plane, according to this diagram, are as follows, compared with Mr. Petrie's measurements :

The base plane AB is on the level of the southeast socket. The pavement line Z on the north side is 40 inches above the base plane. The present north end of the entrance passage floor is at I, 652.94 above the base plane. Mr. Petrie's station mark level near I is $611.2 \pm .1$ above the pavement line. Adding for difference in position of station mark 1.65, also for pavement thickness 40, and for southerly tilt or settlement .1, we have a total of $652.95 \pm .1$.

The intersection of the floor lines of the diagram at E is 215.22 above the base plane. Mr. Petrie's level of this point is $692.95 - 987 \times \sin 26^\circ 26' 42'' (= 173.4) + \text{pavement } 40 + \text{settlement } 1.82 = 215.22$.

The south end of ascending floor line EG is 899.12 above the base plane. Mr. Petrie's level of this point is, end of passage above pavement $852.6 \pm .3$. Deducting for difference of 4 inches in position of the points of measurement, 1.24, and adding for pavement 40, and for settlement 8.76, we have the level, $899.12 \pm .3$.

The intersection of the floor line and south wall line of gallery at V is 1735.03 above the base plane. Mr. Petrie's measure is, level of ditto above the pavement, $1689.0 \pm .5$. Adding for pavement 40, and for settlement 7.95 and deducting for difference in the total length of floor line 1.50, we have 1735.45.

The angle N of the inscribed pentagon is at the level of the top of the 35th course, 1227.15 above the base plane. Mr. Petrie's measure is, top of 35th course, 1187.4 above the pavement. Adding for pavement 40, and for settlement .4, we have 1227.8.

The floor of the king's chamber coincides with the top of the 50th course. Its level above the base plane is: intersection of floor line and south wall of gallery $1735.03 + 3.8 = 1738.83$. Mr. Petrie's measure is: chamber floor above the pavement $1692.8 \pm .6 + \text{pavement } 40 + \text{settlement } 7.95 - \text{difference in points of measurement, } 1.4 = 1739.35 \pm .6$; top of 50th course $1697.6 + \text{pavement } 40 + \text{settlement at the beginning of the course } 1.6 = 1739.2$.

The point I is inside of B 670. 2.* By Mr. Petrie, I is in-

* In the last number of the "Standard" this distance is erroneously given as 652.94.

side of the casing at the pavement 635. 1, + 31.4 for pavement; + (3. ?) for wear: total, 669.5.

The horizontal distances from the north end of the basement sheet, or I the present beginning of the entrance passage floor, are as follows: The intersection of the floor lines at E is distant horizontally 884.59. Mr. Petrie's measure is: horizontal distance between E and G 883.67, difference from settlement + .75 = 884.42

The intersection of floor line and south wall line of gallery is distant horizontally 3956.19. Mr. Petrie's measure is: E to V horizontally 3960.6 ± .9, for difference from settlement — 1.85 for difference in length of floor lines — 2.5 = 3956.25 ± .9.

It will be seen that, on the supposition of a southerly tilt of about 6' having taken place since the Pyramid was built, the agreements, at the several points indicated, are within the fraction of an inch. The differences are so small that they cannot affect the coincidences of a chronological character which we shall now point out.

Genealogical tables from Adam to Christ are given by St. Matthew 1st chapter, and St. Luke 3d chapter. The coincidences depend upon the order and position of the courses and floor stones already determined in the Pyramid, and the order and number of the generations named in the tables. The coincidences will also be found between the dates of certain epochs of Hebrew history, and corresponding distances laid off on the 35th course as a measuring line of time. The dates are according to the chronology adopted by George Smith, F. S. A., in 'Patriarchal Age,' and 'Hebrew People.' Courses of masonry above the pavement are indicated in the diagram by horizontal lines terminating in the line BY. Floor joints are shown by the short lines below the passages. The marks on the 35th course in the diagram denote centuries B. C., one British inch for a century.

If Adam be symbolized in the pavement or foundation course, the 19th course above the pavement, which marks the entrance passage, coincides with the position of Terah, the father of Abraham, he being the 19th generation after Adam. Next above the entrance are two small courses. If both these be assigned to Abraham, the 34th course will coincide with David in

the table of generations. The 35th course, which is of remarkable thickness for its position, may have its own special significance—as it coincides with the upper course of the grand gallery. Turning back now to the entrance passage, we find vertically under the beginning of the 35th course two nearly vertical joints in either wall of the passage. They are the only approximately vertical joints in the passage, and appear to mean something. The length of the 35th course inwardly to the gallery is 2038 inches. If the two floor stones of the entrance passage, which coincide vertically with the beginning of the 35th course, be assigned to Abraham—the 1st symbolizing his natural line, the 2d the beginning of the covenant line—it will be found that Naasson, or the 9th generation from Abraham, falls between Prof. Smyth's 13th and 14th floor joints, and that this is horizontally distant from the beginning of the 35th course 430 inches, and 1608 inches horizontally distant from the grand gallery. Now, Naasson was a prince of the house of Judah in the 2d year of the Exodus, which occurred, according to George Smith, 1608 B. C., and 430 years before the exodus the covenant with Abraham was confirmed.—Gal. iii. 17. Again, David is the 14th generation from Abraham. The corresponding floor stone is between joints 18 and 19. The next stone is in the angle of the entrance and ascending floor lines; it may indicate Nathan, the beginning of the priestly line of David. If these coincidences signify any thing, we might be justified in anticipating the discovery of another chamber, near this point, symbolizing the Temple of Solomon. Directed by the next floor stone to the ascending passage, the first stone above the granite plug would coincide with Solomon in the table of generations. There are 28 stones in the ascending passage, agreeing with the number of generations from David to Christ, Matt. 1. Three important epochs occur in this regal line—1st, the beginning of the captivity of Israel 740 B. C., in the time of Ezekias, of the house of Judah, the tenth generation after David; but the 10th stone is 740 inches horizontally distant from the gallery; 2d, the captivity of Judah, which took place in the time of Jechonias, 586 B. C.; but Jechonias was the 14th from David, and the 14th stone of

this passage is 586 inches horizontally distant from the gallery; 3d, the end of the captivity was 535 B. C., in the time of Zorobabel; but Zorobabel was the 16th from David, and the 16th stone of this passage is 535 inches distant horizontally from the gallery.

We may not be able to say positively that this series of coincidences was designed and planned by the Pyramid's architect, yet it may give ground to believe that such was the fact. Chronologically the period extending from the era of Abraham's entrance into Canaan to Christ, is spanned by the 35th course and the years are numbered by inches along its line. No other course will serve this purpose.

It is suggested that if the floor stones symbolize the generations from Abraham to Christ, the grand gallery may symbolize in its seven-fold structure the kingdom, or Church of Christ, the dispensation of spiritual gifts. The author of *The 'Tower of Egypt,'* appears to think that the apostles (12) and prophets (16) are symbolized by the 28 ramp stones or benches on either side of the gallery. What it all is who can tell? Either the Pyramid is a wonderful structure, or a curious bundle of coincidences not easily accounted for without reasonable purpose and design.

H. G. WOOD.

THE LOGIC OF THE PYRAMIDS.

BY CAPTAIN R. KELSO CARTER.

At the very beginning of this article we appeal to the honest mind to assume the position of an intelligent juror; that all previous opinions and prejudices may be laid aside for the sake of impartially considering the evidence to be presented. Could all men's minds be reduced to this coolly critical condition, we would have no fear for the ultimate result, for we expect confidently to show that no subject in all science, not capable of the most absolute mathematical demonstration, stands upon ground one-half so solid as the Biblical and prophetic interpretation of the Great Pyramid of Jeezeh. The argument for the inspiration of its builder is the grand argument of design. Let us apply it to the facts. In the Indian Ocean there is sometimes found a curious coral formation known as Neptune's cup. When completed it is a perfect goblet with base, slender stem and swelling bowl, and yet it is constructed by many thousands of insects, each working independently of the rest, building its own tomb and leaving its little body as a unit in the general structure. Man looks upon this marvelous production and exclaims: "There must be

an inspiring and superior intellect which has, unknown to them, directed their labors; no human agency did it, God must have controlled its growth." The ablest infidels of this, or any age, stand dumb before this silent witness, and the world acknowledges the power of divinity.

An engineer (Mr. Petrie) sits down, and, with pencil in hand, examines the diagonal vertical section of the Pyramid. This section is a triangle, and he finds that for every ten feet of the base the sloping side rises to the height of nine feet. This appeared to him to signify the raising of ten to the ninth power, and having done this he reasoned that the thing appeared to be connected or to culminate in the altitude of the Pyramid; multiplying this altitude by his former number, he expected to obtain the distance of the sun from the earth, for, said he, this altitude points towards the sun. To his chagrin the number resulting appeared too small; but a few years have changed this opinion, and the number 91,837,497 miles stands to-day as the best of all attempts to measure that important distance. The number of days in the year, the number of years in the great precessional cycle; the diameter of the earth; its mean density; its actual volume and entire weight are, with many other scientific values of the most vital importance, all indicated in the measurements of the Pyramid, and nearly always indicated in a way that directly points to the result as the ten rising to nine and connected with the altitude pointed to the sun's distance.

There is a kind of plant known to botanists which lives by catching living creatures in its sticky embrace, folding around them and deliberately digesting them. The famous theory of evolution receives from this one fact its death blow; for if that plant had evolved from a lower species there must have been a point where it passed from the character of a soil-nourished and air-nourished organism into a flesh-nourished one, and during the progress of that transition it would inevitably have starved to death. So if the builder of the Pyramid had stopped its construction at a certain point, leaving a flat top for use as an observatory, etc., the element of altitude would have been wanting and the whole theory would fall to pieces. But better, we contend, and desire the most able mathematicians to notice the claim, that the construction of any building, with its measurements so marvelously interrelated, was, is, and ever will be an impossibility for the unaided mind of man. This is a vital point, and we insist upon it fearlessly. We contend that no man could possibly have framed so complicated and involved a series of numbers into any homogeneous structure. This will be obvious to every mathematical intellect when we remember that if the builder had taken any other height than he did, the whole thing would have been thrown out of harmony; if he had taken any other base length whatever, the same confusion would have resulted. If you alter a single important line in the entire Pyramid, even a few inches, the plan is at once destroyed. Now let our juror remember that there is a legion of such lines, that every single arc is vital and that every single one had to be thought of before hand: and its necessary relations to the others duly considered. The problem is about this. We will allow that it is possible to find a set of several hundred numbers which, when duly arranged according to a definite but totally unknown plan, will give in several hundred ways a score or more of measurements applicable to the earth, sun, orbits of each, times, seasons, etc., etc. Not one of these necessary first numbers is known to the architect; he is also utterly ignorant of the plan necessary to be followed in order that the numbers, even when found, may be arranged in a way that will be significant of the operations to be performed; he only knows the bare resulting or final numbers (modern science does not even allow that the old architect knew more than a very few of these). Where are the leading mathematicians of the world? Let them step forward and accept the challenge. Suppose we reduce the conditions. Very well, there is no fear. Take the King's Chamber and the red granite coffer contained in it. We unhesitatingly defy any living mathematician to construct a chamber and coffer that shall show such wonderful and various inter-relations as these do with each other and with the

great earth numbers. It is a problem with all the quantities unknown—who will attempt it? We will even go still further and say that it is our deliberate conviction that no man can make a box like that coffer without knowing its dimensions. We mean, let a scientific genius be told to construct a box which should have the same cubical contents as the contents of its sides and bottom, and in which the measurements of every side and edge, etc., should have curious inter-relation with nearly every other—candidly, now, could he do it? Let the force of irresistible logic be felt. How under the sun would he begin? He would have to experiment, of course. At first he would have to try to see how thick the sides must be to have the same contents as the open space inside. If any one thinks that is easy to work out, just try it. Suppose he manages to obtain this, to his disgust he finds that the length of side and thickness of same will not give 3.14154, which it *must* give according to the conditions. Away goes all his former work in an instant and he begins to try other dimensions. Now, when we remember that he may take any length for his box, from half an inch to a million inches, and that only one certain length out of that number is the right one, who would not immediately shrink back appalled at the frightful chances against him? And when we add the fact that even if he gets the right length, he may select a vast number of side breadths which may fill one condition and not another, and that he cannot possibly know that a single thing is right until he has entirely completed the box and tried all the relations; who will object when we hold up the coffer alone as an absolutely impossible problem. Yet this coffer was made and it does fulfill all the manifold conditions without a single failure. Let the argument of design be heard. We ask:

Who made Neptune's cup?

Who made the carnivorous plant?

Who made the coffer of the Pyramid?

—*Heir of the World.*

(TO BE CONTINUED.)

THE RISE OF THE ANTIPODES.

BY C. PIAZZI SMYTH, F. R. A. S., ASTRONOMER-ROYAL FOR SCOTLAND.

Winter came on us rather unexpectedly three nights ago. The day had been pretty cold, but clear; so that when the 8 P. M. postman handed in his budget of letters, we were not a little surprised to find them dripping with sleet, and plastered with snow; while the poor man anxiously explained that he had been taken unawares himself; and not having his *cape* with him, had been unable to defend his paper charge from the sudden storm.

But he had another thing of the unexpected also to tell; for he had a shilling to demand on one of his letters, insufficiently stamped in Australia!

I did not know the handwriting; but there was something heartfelt and earnest about it, so I paid what was due, and then became legally possessed of the missive. Now, years ago I had discussed with a poet what a subject for his highest art would be: "The Book"—*i. e.*, the Bible—and the successive steps of human progress in proportion as the people at large made intimate acquaintance with said Book, in, and for, and by itself alone. How grand all the workings of our own country throughout the Reformation! first, in throwing off the Latin services of the Roman Catholic priests, and then in the Independents, Presbyterians, and Fifth Monarchy men, resisting the semi-Papacy of Anglicanism, and, if necessary, fleeing to America rather than endure it. But the greatest effects, I urged, are

still to come, and from the antipodes; for there large reading and thinking populations are growing up under climatic circumstances very like those of Palestine, holding fast to the Book, and free of our burden here of keeping up old Roman Catholic cathedrals in bright and expensive repair.

So I broke the seal of the drenched letter, wondering, and read as follows from a perfect stranger:—

“DEAR SIR,—I have been perusing with exceeding interest the later editions of ‘Our Inheritance in the Great Pyramid,’ and I am now going to try to steer you in the right track for calculations of sacred time.

“If the Great Pyramid is a built prophetic monument of Messianic times, it must be in perfect harmony with the written Scriptures. Now the June and December solstices never did, and never will, begin the Hebrew year; it was always either the March or September equinox. Beginning the year in January is a Gentile absurdity, and it is a Pagan idea to say of Christ that He was born in December. He was born about, or at, the September equinox (when shepherds were in the open air watching their flocks at night), began His preaching in a subsequent year in the same month, and ended three and a half years afterwards at the Spring or March equinox; and my special object in writing about this matter is, to point out that all God’s ordinances to His people Israel count from the new moons nearest the two equinoxes. And there are two of those ordinances relating to events—one past, and the other to come—more important to Christians than all the rest.

“First, that of Exodus xii., and wherein all sections of Christianity now agree that the slaying of the Paschal Lamb then enjoined was the type of the future slaying of God’s Lamb; and was observed by the House of Israel on the ordered day of the full moon nearest the March equinox in each year, for near 1,600 years, until the event itself took place.

“But at this point the Christian world has fallen into a gross error in promulgating the idea that our Lord was crucified on a Friday. His own prophecy respecting His three days and three nights in the bowels of the earth is stultified by this teaching. Now the Jewish mode of reckoning is evening and morning to make one day; hence Friday evening and Saturday morning make one day, then Saturday evening and Sunday (Easter Sunday) morning would make the second day—a day short! Therefore it is plain, if we believe Christ, that He was crucified on the Thursday.

“Then you will say, What about the Sabbath? Friday is not the Jewish Sabbath, and Christ was crucified ‘in the evening before the Sabbath!’

“But here we come on another error of the whole Christian world, in confounding the phenomenal Paschal Sabbath with the ordinary seven days’ Sabbath. This latter begins at sunset on Friday evening, and ends at sunset on Saturday evening. But in the year in which Christ was crucified, the Paschal Sabbath, or full moon at the March equinox, took place (as I believe) exactly one day before the ordinary seven days’ Sabbath, or on the Thursday evening.

“Wherefore see the truth of Luke xxiv. 21: ‘Yea, and besides all this, it is now the *third* day since these things came to pass;’ and in Matthew xxviii. 1, the word Sabbath is plural in the original.

“Now if the feasts of Israel have, as above, truly and exactly typified the (to us) past death of Christ in the slaying of the Paschal Lamb, should we not naturally expect that Christ’s future return would be typified in the same manner?

“There is not a shadow of doubt about it; and that particular feast is most easily recognized. The Feast of Trumpets is the annual type of Christ’s return, and is held on the first day of the seventh moon, or the new moon nearest the autumnal equinox. That feast was held annually on the particular day enjoined, and when the trumpet was blown the princes of Israel assembled together before the tabernacle of God. Now the New Testament informs us that Christ Himself shall descend from heaven with a shout—a

chief messenger's voice—and with the trumpet of God, and the dead in Christ shall rise first—with a gathering of the princes of Israel before God! Here is type and anti-type in such beautiful harmony that I often wonder how it is the learned cannot see it."

For me to write back that the Great Pyramid began its year of man's religious chronology with the pleiades on the meridian at midnight in the *autumnal equinox* of the year, was so far testimony in the right direction, but very unequal to the volume poured forth by the Antipodean, and of which the above quotations are but a small part.

IS THE GREAT PYRAMID A PROPHETICAL RECORD?

BY JOSEPH BAXENDELL, F. R. A. S.

In Nos. 270 and 273 of the *Banner* I gave reasons for concluding that the generally accepted A. D. reckoning is incorrect, and that the birth of Christ took place 2.09 years previous to its commencement, and that consequently the first arrival at the southern end of the grand gallery in the Great Pyramid occurred in the spring of 1880, since which time events of a most unexpected and trying character to Great Britain have taken place, which, if not wisely and resolutely dealt with, threaten to result in a dismemberment of the empire. It is, however, remarkable that although the date of the birth of Christ which I obtained has not, so far as I know, been accepted by any pyramidist or Anglo-Israelite, no one has proved that it is erroneous, or shown that any other reliable date can be derived from pyramid data. Although I have contributed several papers to the *Banner* on the mathematical and astronomical relations shown in the Pyramid, I have always felt that a large majority of its readers would be much more interested with papers on its prophetic indications, and as my slight efforts in this direction have not been favorably received, I earnestly hope that other pyramid students will take the matter up and give us the results of their investigations in the new volume of the *Banner*. If, on the other hand, it can be proved that there is nothing prophetic in the Pyramid, then how can it be shown satisfactorily that it is "an altar to the Lord in the midst of the land of Egypt, and a pillar at the border thereof to the Lord, to be for a sign and for a witness unto the Lord of hosts in the land of Egypt" (Isaiah xix. 19, 20)? Can it have been erected for no other purpose than to preserve the ancient Hebrew measures, and to reveal some of the elements of the solar system?

Whether my results are correct or not, it is somewhat remarkable that, assuming them to be correct, I had calculated that the second arrival at the southern end of the grand gallery by a line drawn from the foot of the great step to the entrance into the narrow passage leading to the ante-chamber would occur about the middle of September, 1882; but the note by the editor to my paper in No. 273, March 22d, 1882, stating that my "theories had to be proved elsewhere," prevented my sending a notice of this test result to the *Banner*, and it therefore remained to be seen whether any event of importance in connection with the responsibilities and duties of Israel would occur about the time indicated. Of course all the world now knows of the battle of Tel-el-Kebir, and the capture of the rebel chief, Arabi, which occurred respectively on the 13th and 14th of September, 1882, and which at one time made the land of the Great Pyramid, of the Pharaohs, and of the long bondage of Israel, practically a part of the British Empire. Now here we have two events agreeing in the times of their occurrence as nearly as could be reasonably expected

with the results of calculation : the first being the sudden and most unexpected adoption of a course of policy which has never before been adopted in this country, and the second the practical annexation of a land which, next to Palestine, is more interesting to Israelites and Bible students than any other on the face of the earth. Are these facts to be explained by the very convenient theory of coincidences so often called to their aid by baffled opponents in questions relating to the Pyramid, but rarely or never admitted by them to be applicable to questions of science, or other matters? Will any of these gentlemen possessing the necessary mathematical qualifications favor the readers of the *Banner* with a calculation of the probabilities against my two dates agreeing so closely with the occurrence of two events of so much importance in the history of the British people?

The Observatory, Birkdale, Southport, November 7th, 1883.

—From the *Banner of Israel*.

A FEW WORDS FROM ABBÉ MOIGNO.

In response to a circular recently sent out by Mr. Arthur Reade, who has been collecting information as to the habits of literary men in regard to stimulants, Abbé Moigno gives an interesting and characteristic record of his experiences. The letter appearing in his paper, *Cosmos Les Mondes*, states that he has published 150 volumes, small and great; that he scarcely ever leaves his work table, and never takes a walking exercise; yet he never has a trace of headache or brain-weariness, or constipation, or any form of urinary troubles, etc. He never has recourse for his work to stimulants, coffee, alcohol, tobacco, etc., a statement which the sequel shows to need qualification. Snuff-taking he has sometimes practised, but he vigorously condemns it. He has learnt twelve different languages by a method of his own, and with regard to his acquirements in philology and chronology, he says: "I was one of the most extraordinary personalities of my time, and Francois Arago sometimes laughingly threatened to have me burnt as a sorcerer." On one occasion when in Munich for a few weeks and spending his evenings with Bavarian savants, who each smoked four or five cigars and drank two or three pots of beer daily (Steinheil, the most illustrious, boasted of smoking 6,000 cigars a year), the Abbé came to smoke three or four cigars a day. He had also anew taken to snuff, so that when preparing his calculus of variations, a very difficult mathematical work, he would empty his snuff-box (which held twenty-five grammes) in a day. But one day he was surprised to find himself painfully unable to recall the meaning of foreign words, and remember dates with which he had been familiar. Thereupon he formed a heroic resolution, and since August 31st, 1863, when he smoked three cigars and took twenty-five centimes worth of snuff, he had, up to the 25th of June, 1882, touched neither. This was, for him, a complete resurrection, not only of memory, but of general health and well-being; he has had indefinite capacity of work, unconscious digestion, perfect assimilation of food (of which he can take more,) etc. He goes to bed at nine and rises at five "full of vigor." The Abbe is

—Scientific Californian.

LETTERS.

LETTER FROM L'ABBE F. MOIGNO.

My Dear Sir:—I received yesterday, at a late hour, your kind letter. Thanks.

Do not feel anxious ; I am undergoing an eclipse—but even the sun experiences that. My dear journal has been taken away from me by a *confrere*. Although I have not withdrawn my name, I am an entire stranger to *Cosmos Les Mondes*. But the moon will continue her course and the sun shine with new lustre, even sooner than I could expect. Courage! Confidence!!

Nothing will destroy my faith in the Great Pyramid. I shall soon be in a position to publish my French translation of "Our Inheritance." It will cost me much, but God will help me. I shall give to the book the title of "Splendor of Splendors." It will be my seventh and last volume of my "Splendors of the Faith," which will have cost me seventy-six thousand francs, paid by me, a poor priest. The miseries of Mr. Petrie will not frighten me no more than the reverses of Mr. Proctor, whom it is time to pass in silence.

Thanks for what you tell me of the country of Moses. Have you learned that the second canal of Suez will cross the Bitter Lake, and that M. De Lesseps has informed me that the diggings shall be made in such a way as to disclose the remains of Pharaoh's army? Now we shall not be obliged to have capital, and the Great Pyramid will see these eloquent relics grave our museum.

Yours forever,

F. MOIGNO.

LETTER FROM E. C. FRISBIE.

HARTFORD, CONN., January 19, 1884.

Dear Sir:—Yours at hand. Have sent 234 of the following circular to the drug trade of this State. Received 114 replies. With a very few exceptions they are *decidedly* unfavorable to the metric system, and while a few show themselves quite familiar with the subject, and favor it for chemical and analytical work, they do not think it practical for the drug trade as a whole.

Yours truly,

E. FRISBIE.

"HARTFORD, CONN., January 14, 1884.

Dear Sir:—Do you have need to use the Metric System when compounding prescriptions?

"Do you have a scale adjusted to the Metric Standard?

"What is your opinion of the Metric System as relates to the drug business?

"Do you often find inaccuracies in physicians' prescriptions when written by this system?

"Please mail me immediately a full and careful reply to each question.

"This is important and calls for immediate action.

"It is my purpose to bring this subject before our Association at its meeting in February, and your reply will greatly aid me in furnishing data upon which to base my argument.

"Yours very respectfully,

"EDWARD C. FRISBIE."

EXTRACT OF LETTER FROM THEO. GRIBI, ELGIN, ILLINOIS.

I was deeply interested in the conclusion of Mr. Jacob M. Clark's "Metric Analogues." There are some thoughts advanced there with respect to the interpretation and inspiration of prophecy which are very weighty. But the most important feature of the Great Pyramid for future investigation seems to me to be the "Granite leaf." I do not share the extravagant hope of finding plans and records of the Pyramid therein, nor do I think that the removing of the wainscoting of the ante-chamber would reveal any secret passages or chambers, as Mr. Thomas Holland, of London, in No. 5 of the Magazine suggests. Such a presumption as the latter is not born of a comprehensive view and appreciation of the general architecture of the structure. The ante-chamber, with all its details, whatever they signify, is evidently a *finished* room, full of meaning, full of harmony, which the removal of any of its details would seem to destroy. If any undiscovered chambers and passages exist—which I doubt very much—I think the entrance to them will be found elsewhere. It is different with the supposition that there is something treasured up between the stones of the granite leaf. Here every architectural feature of it, its very position in midroom, points toward it, and surely it is highly presumable, that the architect should have left somewhere at least, a copy of the standard or standards employed in the building, if indeed the preservation of that standard was of paramount importance to him. But records or plans of the building I scarcely think will be found even here. In my estimation the finding of any such documents would materially damage the theory of its inspired origin, nay, it would forever banish it from my mind. As, I believe, I said in a former letter, the Grand Pyramid would not appear half as divine as to its origin, purposes and intent if it were covered all over, outside and inside, with hieroglyphics extolling all its wondrous relations and commensurabilities. The inspired origin of human records has been impeached, but the records of the silent universe cannot be impeached, for its harmonies speak louder than words. As to the "Ballard theory of pyramid solution," I fear that it will go no further than to prove the fact of its (the pyramids') comprehensive geometrical design. There is not enough data to show that the pyramids have ever been used for any purposes other than as tombs; yet this does not militate against the fact that the Great Pyramid is eminently fitted and located as a central point for a grand geodetic survey and may be used as such yet. To my mind, the Great Pyramid, aside from the possible uses which it may serve in the future, is a great parable which has tested the wisdom of the world for ages, and will still continue to test it, as a touchstone, until it has exposed all the dross that is in that wisdom. Men of every belief, religious, scientific and practical, have come and rubbed their intellects and *opinions* against it, and the Pyramid has tested them; yea, many of them have been "weighed in a balance and found wanting," and it behooves every man before attempting to unlock its mysteries to make sure that he has the right key in his hand.

LETTER FROM THEO. FABER.

Dear Sir:—The receipt and perusal of your 'Appeal' inspires the writer to an effort to contribute, if possible, "a mite" of valuable suggestion in the line of the noble object of your society, which the 'American nation' will learn to appreciate more and more by closer investigation into the comparative merits of the respective two opposing systems of "geometrical measuring," namely, the "anti-metric" and the "metric" system, the latter of which, certainly in *appearance*, would *seem* to indicate material advantages which, however, utterly vanish on a closer comparison. For instance, how many 'decimals' have already been added to the orthodox infinite ratio $3.14159 + \dots$? Ask your member Mr. S. C. Gould, of Manchester, N. H. He verbally informed the writer, not long ago, that 707 decimals had thus far been added to that ratio! Imagine, now, the time and

labor required to use that number of figures for "a square root!" And then suppose that what such immense array of 'decimals' was intended to accomplish in the way of a mere *approximation* of sought for result, could be gained, with absolute perfection, in every case, by a simple *finite ratio*, in place of the *infinite*, which of the respective two methods will command final universal preference all over the world?

Of course, so long as the "grand problem," the solution of which, for all ages past, has been intensely sought after by 'science,' and especially by astronomy—remained *strangely* unsolved, none other but an infinite ratio could possibly have afforded any satisfaction at all; but the moment the final solution of the great problem looms up in an irrefutable form—such that by the use of a simple ratio, such as 9:8, the *exact area* of any circle so ever of a given diameter can instantly be found—the use of the decimal fraction, in geometrical measurements, becomes the *opposite of exact!* And, if the anti-metric system *proves its superiority* in obtaining the ends sought for, would it not imply *treason to common sense* to cast it aside in favor of the opposite system? But who can value, in all its extent, the beneficent nature of the great discovery so long searched after in vain?

What a glorious opportunity is here offered to your society to take a *manly* stand on the side of *truth* versus ancient error, which latter has been strangely propagated up to our days. *Truth* will prevail against all prejudice.

Your obedient servant,

THEO. FABER.

LETTER FROM ASAHIEL ABBOTT.

833 DEAN ST., BROOKLYN, NEW YORK, January 21, 1884.

Dear Sir:—Are our members to join in that ignorant crusade against reason and common sense, of which we have had examples years since in our city, when we treat of the Pyramid and its measures? First, we must find eras of history or prophecy marked in the interior ways; next, we must have prophecy inscribed somewhere. And so the fictitious Christian era must be our starting-point, when all who know anything of chronology know that some silly conjecturer in the dark ages has marked it several years out of its proper place. Then the grand gallery *must* signify the Christian dispensation and its inevitable break down about the awful period of the lion in Egypt, if not the French at Moscow; then the queen's chamber must stand wide open for the Jews that have repudiated Christ; and now *mirabile dictu!* it has become the hold of the Romish communion!!! Sooth! why not stow away there the Buddhists, or the Brahmins, or the negroes of the island of Madagascar, or some other rubbish, since it must be occupied with something worthless? Meanwhile, in comes some one with a whole army at his back and tries to force it in edgewise as far as it will go. Is this children's play to go on? If so, how long will our association be likely to hold together? To roll back the torrent of atheistic sciolism from our old sacred measures is no holiday task, and can scarcely be done if the very men who associate for that purpose show that they lack common sense. We need the aid of leading Catholics, like Abbe Moigno, and of all true men, Catholic or Protestant, Jew or Greek; but, above all, we need true science, and should to the utmost eschew foolish speculation in our studies. In the Pyramid are physical truths sufficiently numerous, without lugging in our tuppenny controversies concerning things that have no relation to the matter in hand. The Pyramid is a mathematical fact; and the king's chamber, with its coffer, forms a portion of what is evidently a complex and most beautiful system of just proportions—just measures and weights. Let us use it rightly and not mingle with our studies "foolish and unlearned questions" that can but "gender strife." Let our mathematical fact, then, stand upon its own basis without mingling with it a single fancy of our own, then we shall at least *deserve* the respect of our opponents, as well as *possess* our own.

Yours truly, in haste,

ASAHIEL ABBOTT.

MOBILE, Jan. 22d, 1844.

My Dear Sir:—I have finished the copy of the STANDARD for the current month; it is excellent—every article a gem.

Particularly do I value the two portraits; and if the faces presented there are not indicative of the characteristics of their originals, I am no judge of physiognomy.

In "Editorial Notes" it is stated that a gentleman, name not given, offered to be one of ten to subscribe \$10,000 each for the expenses of "The American Metrologic and Scientific Exploration of the Pyramid."

I would like to know the gentleman, for it would be a pleasure for me to congratulate as well as thank him, for it is evident that whoever furnishes to the Institute the means of "unsealing" the pyramid mystery in these days of *unsealing*, will acquire the grateful homage of his fellow men as one of a noble line of public benefactors, like George Peabody, Peter Cooper, and their kind. When I recall to mind how munificently the merchant princes of America have always responded with their wealth to calls for aid for educational and charitable and scientific objects—and how many thousands of dollars, and the valuable lives of heroic men, have been fruitlessly expended in useless searching in the frozen zone of the Arctic circle, I cannot doubt but some one will be moved to give of his or her abundance, that our knowledge of this great conservatory of wisdom may be complete, and the purposes of the great architect in designing and building this encyclopædia in stone, be laid bare for the good of all men.

It may be urged—in opposition to present activity—that there is a state of war now existing in the Upper Nile country, and that the hostilities may be soon transferred to the vicinity of Cairo and the Pyramid.

I do not so view it; on the contrary I think that the presence of an English army would be a very desirable thing and most fortunate for an exploring party, whether in peace or war. I feel assured that in the immediate future some wealthy citizen, moved by a desire to do good in some new way, will provide us the means. Lorrillard has equipped a party now at work, for Yucatan exploration, which promises to be a great success; Bennett sent out Stanley and maintained him and his little army until his object was accomplished, Vanderbilt brought the obelisk to New York—all at much greater expense than pyramid exploration would cost—prompted by a desire to do something or produce something, by means of their great wealth, in which all their fellow citizens might share. Surely so great, so paramount an object as the unfolding the mighty secrets which a divinely inspired architect sealed up forty centuries ago—against these days of men's necessities, when the need of a new revelation of God's word and work is felt as never before—cannot go much longer unnoticed. I am confident we shall soon see the necessary means forthcoming. I wish we could exhibit the model shown at Boston at our New Orleans Exposition this year; it would be an excellent opportunity; I will take the matter in hand if desired.

I shall soon be able to devote more time to this subject I expect, and then take hold to push the work all I can.

Sincerely,

W. C. COX.

CHAS. LATIMER, ESQ., Cleveland, O.

SYNOPSIS OF LETTERS RECEIVED UP TO FEBRUARY 9TH.

W. T. Alan, Greenville, Pa., has sent us some interesting notes upon the numbers 5, 7, 12 and 13, and the relations between numbers, colors and geometrical forms. We may give a paper upon these subjects in a future number.

Lucian I Bisbee, Secretary of the International Institute at Boston, writes: "The 'Model Pyramid' in the Foreign Exhibition, on which I have spent so much time and

money, was consumed with its valuable papers, books, etc., on the morning of the 5th of January. I shall begin at once to prepare new drawings for another model, same size."

J. L. Dampier, of London, Canada, says: "I am reading the last STANDARD with great delight; each one surpasses the other with increased interest and information. I would my pen were like the pen in the dream of the Elector, when I consider this wondrous revelation of God's love and forethought in thus, as it were, coming down and tabernacling amongst us. The Pyramid is a veritable Jacob's ladder, closely connecting heaven and earth. No dream now of weary traveler with stone for pillow and sky his canopy—no dream, but an actual handling of the revelation of God."

Mrs. Rebecca N. Hayard, Kirkwood, Mo., writes: "I think you deserve much credit for creating in so short a time a magazine of such great literary value, and I congratulate you heartily upon your success."

On the same subject Adjutant W. K. McAllister, St. Paul's School, Garden City, says: "The truths so long hidden in the Great Pyramid are unfolding so fast, and are so fascinating, that I would not miss reading a single number of the STANDARD for more than thrice the year's subscription."

Arthur S. C. Wurtele, C. E., Albany, New York, writes: "The INTERNATIONAL STANDARD is improving every number, and ought to have a large subscription list. When more at leisure, I may get up an article as you suggest. All our mechanics must be with you in your efforts to prevent the useless confusion that would result from a change of standards."

J. M. Durkee, Pittsfield, Mass., sends a table designed to exhibit the analogy between the days of creation and the seven dispensations. With reference to the Pyramid, he says: "This great book of God is about to be opened; the 'seals' are broken."

ADDITIONAL LETTERS.

L. Biden, Portsea, England.	F. G. Williams, Alkali, Oregon.
L. F. Haskel, San Francisco, Cal.	Rev. James Upjohn, Neenah, Wis.
John G. Godwin, London, England.	Rev. Jesse Jones, N. Abington, Mass.
S. H. Reeve, South Eliot, Me.	Sandford Fleming, C. E., Ottawa, Canada.
Charles W. Russell, Chicago, Ill.	Mrs. W. A. Plumptre, E. Retford, England.
Rev. Jos. A. Seiss, D.D., Philadelphia, Pa.	Prof. Edwin Graham, Fairville, Mo.
Carson Sake, New York.	Prof. W. A. Rogers, Cambridge, Mass.
Joseph Massey, Royalton, Mich.	Mrs. H. E. Godfrey, Grass Valley, Cal.

TRANSACTIONS OF THE OHIO AUXILIARY SOCIETY OF THE INTERNATIONAL INSTITUTE.

JANUARY 2, 1884.

Mrs. J. R. Smith, of New York, and L. W. Perry of Cleveland, were elected members.

A paper from the Abbe Moigno, of Paris, on the "Prime Meridian and the Metric System," and another on the search for relics of Pharaoh's army in the Red Sea salt marshes in building the Suez canal were postponed for two weeks. A paper was read from Samuel Beswick, C. E., criticising the new measures of F. Petrie and claiming that Petrie has only the more completely confirmed the measures of Piazzi Smyth and others, and concluding that they confirm more completely the theory of J. Ralston Skinner that the unit of the pyramid builders was undoubtedly the British measure of to-day.

A paper by Joseph Baxendell, English astronomer, showed the relation between the moon's synodic period, the equatorial and polar diameters, the diameter of the earth in latitude of the Pyramid, to the entrance passage angle of the Great Pyramid and also angle of the pole star, α draconis from the pole at lower culmination. He also showed that the area of a right section of pyramid divided by the area of the greatest inscribed circle is equal to the squares of the height of the Pyramid divided by the square of the diameter of the inscribed circle, which is true of no pyramid of any other angle than that of the Great Pyramid of Ghizeh.

Rev. H. G. Wood, of Sharon, sent a paper announcing an important discovery touching the ratio of the length and breadth of the base of the Great Pyramid. He says the south base appears to have settled about four or five inches towards the southwest corner. The north base line is very nearly level. This settling would account for the tilt of the king's chamber towards the south and west, described by Professor Smyth in "Life and Work." There is, however, no disturbance in the grand gallery or entrance passage.

Thomas F. Rowland, president of the New York Society, wrote that much interest is manifested by members in New York and New Jersey, and that the branch society gives promise of vigorous growth.

An English member, Mr. Lewis Biden, thinks there are great wonders in the Pyramid on the eve of discovery in connection with the raising of the granite leaf. He believes that this will be effected through the influence and probably in the presence of one of the sons of the Queen of England.

After interesting discussions and the reading of other papers and letters, the meeting adjourned for two weeks.

January 16, 1884.

Much enthusiasm has recently been awakened respecting the proposed American expedition to Egypt.

In connection with this subject a letter from Rev. Jesse H. Jones, with accompanying communications from Professor Piazzi Smyth, and Rev. Jevons M. Perry of Alnwick, England, were received with much interest. Rev. Mr. Perry believes that an astronomical observatory could be established on the top of the Great Pyramid, and kindly offers his services and the use of his telescope for that purpose, if the expense of transportation can be defrayed by the Society.

The Society is in receipt of a very valuable work on the Great Pyramid from John G. Godwin of London, England, librarian to Lord Bute, written by a Roman Catholic priest, Father Thomas Gabb, in 1805. Father Gabb thinks that the Pyramid was constructed by antedeluvians, and that the sands in which it is embedded were deposited there by the flood and are gradually being removed by the wind, and states that at the

time of Herodotus the sand surrounding the Great Pyramid was much deeper than at the time of Greaves, and suggests that immediately after the flood it may have been entirely buried from sight.

A report of the Buffalo Microscopical Society was read, in which was described a micrometer scale prepared and tested with great care under the personal charge of Professor Barnard of Columbia College, and J. E. Hilgard and C. S. Price of the United States Bureau of Weights and Measures. The ruling, which was done by Professor W. A. Rogers of Cambridge Observatory, is upon a platino iridium bar of one by two centimetres, and consists of 1-100 of a metre subdivided to millimetres, and one of these to tenths and hundredths.

From the report it might be inferred that both Professor Rogers and Professor Hilgard were in favor of the metre; but such is not the case as both are strongly opposed to it, and are members of the "Anti-Metric Society." This is merely an attempt of Professor Barnard and the Columbia College people to fix the metre as a standard of length on the Microscopical Society.

After the reading of other letters, Professor N. B. Wood made an interesting demonstration of his ideas of weighing decimally, in which method of weighing he would use the avoirdupois pound of 7,000 grains with decimal subdivisions down to the one-hundredth of a grain.

Mr. Wood is now making a set of weights according to his method of weighing, which he will soon have finished.

After discussing the plan at some length the meeting adjourned until January 30th.

The members elected were :

Mrs. J. B. Cummings,	Chelsea, Massachusetts.
Mrs. Hattie Hutchinson,	Chelsea, Massachusetts.
E. L. Brown,	Brockton, Massachusetts.
C. V. Kasson,	Detroit, Michigan.
C. T. Heisel,	Cleveland, Ohio.

SPECIAL MEETING.

January 23, 1884.

The paper of the evening was the communication from M. L'Abbe Moigno with reference to the prime meridian and the metric system, in which he manifested his unflinching opposition to the advocates of the metre.

In reference to the American yard, Professor W. A. Rogers of Cambridge wrote that there has never been any legislation establishing "Bronze 11" as a standard, but that it has been adopted for some twenty years as a standard by the action of the superintendent of the Bureau of Weights and Measures when this bar was received in 1856, and it was then stated to be about one ten-thousandth of an inch longer than the Imperial yard. From two independent comparisons made about 1879 the relation Bronze 11 plus .000088 inch = Imperial yard was adopted. But a comparison made during last summer gives only .000022 inch too short, so that within narrow limit there seems to be still some uncertainty. The result of his investigation goes to substantiate the latter value. The professor promises to send the Society, in a short time, a full discussion of standards, which promises to be a very valuable paper.

Mr. E. C. Frisbie, druggist of Hartford, Connecticut, wrote that he had written several hundred of the druggists of Connecticut asking their opinion of the metric system, and so far had received answers from one hundred and fourteen, the most of whom are opposed to the French system.

Other letters were read from Rev. J. A. Upjohn, Neenah, Wisconsin; Mrs. W. A. Plump-tre, England; and Rev. E. P. Ingersoll, Rosevale, Kansas.

The President read an article from the Chihuahua *Enterprise* in reference to the estab-

lishing of the metric system in Mexico, which stated that after the 1st of January, 1884, the use of the metric system in Mexico would be enforced by law.

The President stated that in a recent interview with Rev. H. G. Wood of Sharon, the latter had told him that he had just made some valuable discoveries touching the religious aspects of the Great Pyramid, endeavoring to prove that the courses of masonry represented generations from Adam, and the beginning stone of grand gallery represents the Messiah. This is independent of the same view by G. A. R. of England.

The members elected were :

James McAllister,	Sinclairville, New York.
W. P. Horton, sr.,	Cleveland, Ohio.

After an animated discussion the meeting adjourned till January 30th.

January 30th, 1884.

The members elected at this meeting were :

R. W. Burnet,	Cincinnati, Ohio.
L. Sharp,	Providence, Rhode Island.
W. C. Whittimore,	Chicago, Ill.
W. W. Andrews,	Cleveland, Ohio.
H. B. Seymour,	Cleveland, Ohio.
Arnold Hersent,	Cleveland, Ohio.

A paper from the *American Machinist* entitled "Opposition to Changes of Measurement," indicated that manufacturers are not so apathetic on this subject as they are supposed to be, and that any effort to make a compulsory change would be met by strenuous opposition.

The writer cites the trouble incurred by the Board of Trade in trying to establish a new standard sheet-iron guage for Great Britain.

A letter was read from Professor J. E. Hilgard, Superintendent United States Coast and Geodetic Survey, stating that he had forwarded the Society copies of the coast survey reports from 1870, and that all future reports would be sent the Society. In reference to American standard yard, Bronze No. 11, he wrote: It is found to be at 62° Fahrenheit less than the Imperial yard by 0.000088 inch. Therefore Bronze No. 11 is a standard yard at 62°.25 Fahrenheit. The yard of the Troughton scale at 62° Fahrenheit exceeds the Imperial yard by 0.00084 inch, and is a standard yard at 59°.62 Fahrenheit.

Favorable criticisms of the Society's magazine, THE INTERNATIONAL STANDARD, were read, showing that there is a continually growing interest in the work of the Society.

The paper on "The Chronology of the Pyramid," by Rev. H. G. Wood, of Sharon, was listened to with great interest. Mr. Wood thinks that the different courses of masonry represent different epochs, and that vertical lines drawn from the respective courses strike prominent points in the passages representing different ages of the patriarchs. For example, a line drawn from the thirty-fifth course strikes stone in the descending passage representing the time of Abraham, and a line drawn from the fiftieth course strikes stone representing the exodus, etc., and the distance between these points in inches corresponds with the years intervening.

Samuel Beswick, civil engineer, of Canada, in his criticism of William Flinders Petrie's recent work at the Pyramid, agrees with Rev. H. G. Wood in his deductions and explanation, and thinks that Petrie gives fuller points on prior measurements made by Colonel Howard Vyse and Professor Smyth, and states that the major part of his book is devoted to the second and third pyramids and other Egyptian monuments.

Letters were also read from Mrs. Rebecca N. Hazard of Kirkwood, Missouri; Theodore Gribi, Elgin, Illinois; J. L. Dampier of Canada, and others.

The President then gave a very interesting blackboard demonstration of what he calls "Lotus Flower of the Pyramid." He constructs a square with side equal to the

square of the length of the coffer in the king's chamber or 8,100, and by circumscribing circles and inscribing squares he deduces a triangle with the exact proportions of the Great Pyramid of Gizeh, and by using the other dimensions of the coffer he arrives at the lengths and dimensions of the different chambers and passages. His demonstrations were followed very closely, and all went away with an increased reverence for the science and wisdom contained in the gigantic pile of masonry.

February 13, 1884.

A communication was read from Mr. E. C. Frisbie, druggist, of Hartford, Connecticut, stating that the majority of answers to the circular sent to the druggists of the State, some time since, were in favor of our present units and opposed to the French metric system, and at the annual meeting of the Connecticut Pharmaceutical Association, held at New Haven on the 6th inst., the following resolution was adopted:

Resolved, That in the opinion of this Association, the adoption of the French metric system would be a detriment to our interests as pharmacists and as practical business men.

Much interest has been aroused throughout the country in the last few months relative to the proposed Pyramid expedition, and a number of encouraging letters have been received from prominent persons, several promising contributions and support to the extent of their ability.

Letters were also read from Dr. Seiss, of Philadelphia; Samuel Beswick, C. E., Canada; Jacob M. Clark, of New York; J. K. Kornish, of Denver, Colorado; Mr. Frank Norton, editor of the *New York Evening Telegram*; W. K. McAllister and others, in all of which the importance of the Pyramid expedition is urged, a deep interest expressed in its teachings and a continued feeling of opposition to the French metric system. One of the correspondents stated that Senator Morrill would present a bill before Congress, this session, to have the five and three-cent nickel coins withdrawn, to be replaced with five and three-cent silver coins, their size and weight being expressed in terms of the French system, and to have the one-cent copper coin replaced with one-cent nickel, thus engrafting the French system on our coinage. After the reading of a letter from the Governor of California relative to the standards of measure for that State, Dr. J. W. Redfield made a few interesting remarks, giving his idea of the meaning of Isaiah xix, 19, which speaks of their being an altar in the midst of the land of Egypt and a pillar at the border thereof. Heretofore it has been thought by pyramid students that the "pillar at the border thereof" referred to the Great Pyramid of Gizeh, but the doctor thinks that "an altar to the Lord" refers to the Pyramid, and the Sphinx is "the pillar at the border thereof." The doctor cites a number of Scriptural passages in support of his views, and thinks he has the correct interpretation of the passage.

His remarks were followed by an interesting discussion, after which the meeting adjourned for two weeks.

The members elected were:

Jacob Klein,	St. Louis.
William Ernstein,	St. Louis.
J. M. Durkee,	Pittsfield, Massachusetts.
E. Jane Copeland,	Byrantville, Massachusetts.
Frank Norton,	New York.
Theodore H. Lowe, C. E.,	Denver, Colorado.
A. C. Getchell,	Cleveland, Ohio.
George P. Burwell,	Cleveland, Ohio.

A subsequent communication from Mr. Frisbie, states that the resolution referred to was tabled and not passed.

MEETING OF THE NEW YORK AND NEW JERSEY AUXILIARY OF THE
INTERNATIONAL INSTITUTE.

Friday, January 11, 1884.

A meeting of the New York and New Jersey Auxiliary Society of the International Institute for preserving and perfecting weights and measures was held at two o'clock this afternoon at Cooper Union. A number of grocers, drygoods dealers, druggists and others to whom the question of weights and measures is of importance, attended the meeting. Mr. J. N. Wing, secretary and treasurer of the society, in speaking of the subject, said to a *Telegram* reporter to-day: "This Auxiliary Society was established on November 15. The International Institute numbers something over one hundred members in New York and New Jersey. Mr. Charles Latimer, of Cleveland, is the president of the International Union. In that city a strong organization is in existence, and it was owing mainly to their indefatigable work that a bill introduced in Congress to change the order of our present weights and measures to the French metric system was killed. Efforts are still being made to get the United States to compel the adoption of this system, as was done in Germany. Our weights and measures are good enough as they are, and if they were changed it would entail an enormous and useless expense on all persons using weights and measures." Professor Davies, of Columbia College, has said: "The French metric system is inapplicable to the ordinary affairs of humankind, being full of errors in science, and requiring innumerable patchings in practice to make it hold water at all." President Barnard, of the same college, also has said: "The authors of French metric system ought to adopt in place of their superficial earth measure the metre, the Great Pyramid axial reference of the cubit, on account of its immense superiority in science."—*New York Evening Telegram.*

EDITORIAL NOTES.

The diagrams which illustrate the paper of Samuel Beswick, C. E., in this number, are taken from "The British Mile," No. III, by Rev. H. G. Wood, in the Magazine for January.

Our thanks are due to Mrs. Emily Lewis, of Philadelphia, for her translation from the French, of the papers of M. L'Abbé Moigno, which appears in this number of the Magazine.

In addition to many other favors, Prof. C. Piazzi Smyth has sent us for a future number of the INTERNATIONAL STANDARD, a portrait and biographical sketch of the late William Osburn,

of Leeds, England, author of 'Monumental History of Egypt,' 'Religions of the World,' and other works. The portrait is the work of Mr. William Hawson, of Leeds.

We publish below the propositions enunciated by the Geodetic Conference which took place in Rome last October. It is very plain that a sop was thrown to England and America, they being the Anglo-Saxon world, in adopting the meridian of Greenwich as the prime meridian for the world, hoping thereby to secure for the pride of France the adoption of the metric system. "Our representative" is credited with having proposed an international conference touching the adoption of these propositions. The conference puts it that they accepted "the proposition of the representative from the United States," as if to show that our people are ready for the French metre. In this our French metric advocates will find themselves very much mistaken. Let them listen to one voice from France in this number, who denounces the false metre born in France in 1793.

At the congress recently held at Rome, twenty-eight States were represented, and resolutions embodying the following principles were adopted by the delegates present :

1. The unification of longitude and of time is recommended to all Governments, as forming a suitable basis for international treaties; the scientific and practical advantages resulting from such an arrangement more than compensating for any inconvenience attending its introduction. This arrangement would be carried out in all astronomical and nautical almanacs, except as regards any data in which a local meridian and local time are indispensable.

2. That information should be diffused as to the decimal subdivision of the quadrant, and that this system should be partially introduced as regards calculations, etc., although the present system can hardly be superseded with respect to navigation, etc.

3. The meridian of Greenwich being the most generally accepted, it is recommended for adoption in the proposed international arrangement.

4. It is suggested to reckon longitude only from west to east, starting from the meridian of Greenwich.

5. For purposes of railway, steamboat, post and telegraph services, the adoption of a universal time is recommended; local time being still used for ordinary purposes.

6. The foundation for this international time would be noon according to Greenwich time; the hours being reckoned from 0 to 24.

7. States which accept the new system of unification should adopt measures for its introduction as soon as possible.

8. The adoption of the English meridian will, it is hoped, urge England to take steps as to the question of uniformity of weights and measures.

9. The proposal of the United States Government for a special conference is approved ; and wishes for the holding of an international convention for the ratification of the proposed uniformity of longitude and time are also expressed.

The only important case of absence from the voting was that of the representatives of Holland, the Government of that country preferring to await the result of the congress to be held in 1884 at Washington.

OBITUARY.

We deeply regret that we have to record the death of one of our most worthy and distinguished members and workers, Commodore William B. Whiting, United States navy. The Society has suffered a great loss in his death. He was an active member of the Committee on Standard Time, and gave most valuable information, maintaining in the most emphatic manner the necessity of the adoption of the Great Pyramid as the prime meridian of the world. In this we venture to predict that he uttered words that shall have their fulfillment before many years.

REVIEW.

THE NUMBER COUNTED 666, AND THE NAME COUNTED 888. By the Rev. James Upjohn, of Neenah, Wisconsin.

The names of these books are enough to suggest a veil of obscurity; nevertheless the information of Mr. Upjohn is rather to shed light upon the scriptures. He is a follower of Dr. Mahan, in whose work called 'Palmoni and Mystic Numbers,' will be found a similar vein of thought; but the Rev. Mr. Upjohn has trodden in a new field, though in the same line. We advise all students to investigate both the thoughts of Dr. Mahan and of the Rev. Mr. Upjohn, for notwithstanding the titles are seemingly so abstruse, there is great truth concealed in the numerical values of the Hebrew scriptures. Indeed they are a perfect mine of wealth; it suggests the thought of "the tree which bare twelve

manner of fruits." We have the letter and the spirit. Mr. Skinner touches the astronomical and mathematical, Dr. Mahan the chronological, and Rev. Upjohn the numerical values of names which in the old kabbala is considered the grandest test of all inspiration, truth and divine wisdom.

INQUIRERS' CLUB.

In relation to the question of Mr. Reeve, there are several reasons why we may conclude that it is a fact that the order of Free Masons had its origin at the building of the Pyramid; the first is that the Pyramid is a symbol of mathematics and astronomy, and the masons were formerly called "matimatici" or "geometrici;" they were also called "Sons of Light," and they have been, as an order, persecuted in various epochs of the world and driven out by different sovereigns. Bunsen says that the Pyramid was called A. O. R., which means Light, and the word "light" is one of the oldest and most remarkable in existence. A structure containing the highest order of knowledge ever attained by man, and which, indeed, as those who have investigated know, reached and does reach into futurity, could never have been constructed without an order of men, who must have handed down their symbols and signs from age to age; and, although we believe that they have lost their key, yet it would seem that the masonic order, in its symbolism, does contain much of the WISDOM of the Great Pyramid, but unknown to the order as a general rule. As to the corner-stone being the northeast, I believe that the writer is correct. However, the southeast corner-stone of the Great Pyramid seems to be the controlling stone as far as is shown by Mr. Petrie's measures.—A. O. R.

In answer to "Veri Surrexit" there is more in this thought of the granite coffer representing the Resurrection than at first thought might be supposed. It seems to me certain that the coffer in the king's chamber represents the new birth, and the new birth is certainly complete in the Resurrection.

The coffer is a pyramidal lotus flower ever blooming; of which more hereafter.—
Natzir.

In relation to the question of S. F. G. about the position of the Pyramid east of Greenwich, we have to say that the longitude of the Pyramid is not precisely known, but as near as we have it, its location is two hours and five minutes east of Greenwich.—L.

I have enjoyed the article by J. W. Redfield on "The Altar and Pillar of Jehovah," and I cannot but stop and think on the curious fact he has brought out that a pyramid of stones—arranged as he says the Israelites were commanded to build their altars—contains the same relation between the number of stones in each successive layer and their differences as the spaces traveled over by a falling body in vacuo, *i. e.*, the number of stones in each successive layer is as the square of the number of layers from the top, and the difference between each successive layer as the spaces traveled over during each second of a falling body; and I asked myself the question: would a pyramid constructed in that way of balls of equal sizes be in the same proportion with respect to height, and length of base, and subtend the same angle by its sides as the Great Pyramid of Jeezeh? *i. e.*, would it be π proportioned? This may be a matter well worth examining. T. G.

ERRATA.

Page 472—11th line from top, for eternal ear, *read* internal.

Page 526—8th line from bottom, for 180 A, *read* 180².

Page 528—The editor stated that there were only two cubits, he omitted the third—the sacred cubit of 25 inches.

Page 15, Vol. II., 3d line from top, in place of “most” *read* midst.



The Rev. Sir HENRY BOURGHIER WREY, M.A., Baronet,
OF TAWSTOCK DEVONSHIRE

THE
INTERNATIONAL
STANDARD

A MAGAZINE

DEVOTED TO THE DISCUSSION AND DISSEMINATION OF THE WISDOM CONTAINED
IN THE

GREAT PYRAMID OF JEEZEH IN EGYPT

MAY, 1884.

ISSUED BIMONTHLY. PRICE 35 CENTS

TERMS OF SUBSCRIPTION AND MEMBERSHIP, \$3.00 PER ANNUM IN ADVANCE

The International Institute as a body is not responsible for the facts or the opinions put forth by any of the writers for this Magazine.

All in favor of advancing truths most absolute, as portrayed in the revelations of the Great Pyramid of Egypt, and of the success of the Society in preserving inviolate the Anglo-Saxon weights and measures, will kindly communicate with the President, by whom also subscriptions, donations and communications will be gratefully received.

THE INTERNATIONAL INSTITUTE

FOR PRESERVING AND PERFECTING THE ANGLO-SAXON WEIGHTS AND MEASURES

CLEVELAND: 30 EUCLID AVENUE
BOSTON: 345 TREMONT STREET

INTERNATIONAL INSTITUTE FOR PRESERVING AND PERFECTING WEIGHTS AND MEASURES.

FOUNDED NOVEMBER 8, 1879.

CHARLES LATIMER, President, Cleveland, Ohio.
J. S. F. HUDDLESTON, Vice President, Boston, Mass.
LUCIAN I. BISBEE, Secretary, Boston, Mass.
G. R. HARDY, Treasurer, Springfield, Mass.

OHIO AUXILIARY SOCIETY.

CHARLES LATIMER, President. Wm. H. McCURDY, Treasurer.
A. M. SEARLES, Vice President. G. W. CROSSETTE, Cor. Secretary.
MARY B. SANFORD, Recording Secretary.

PUBLISHING COMMITTEE.

CHARLES LATIMER, C. E. } Editors. J. H. DOW. J. W. REDFIELD, M. D.
H. C. THOMPSON, } W. W. WILLIAMS. J. A. BIDWELL.
MRS. A. M. SEARLES. MARY B. SANFORD.

COMMITTEE ON STANDARD TIME.

REV. H. G. WOOD, Chairman of Committee, Sharon, Pennsylvania.
PROF. PIAZZI SMYTH, Astronomer Royal for Scotland, F. R. A. S., F. R. S. E., etc.,
Edinburgh.
M. L'ABBE F. MOIGNO, Canon of St. Denis, Paris, France, editor of *Cosmos Les Mondes*,
and author of "The Splendors of the Faith."
SANDFORD FLEMING, C. M. G., M. Inst. C. E., F. G. S., F. R. G. S., Ottawa, Canada.
WILLIAM H. SEARLES, C. E., Elyria, O.
JACOB M. CLARK, M. Am. Soc. C. E., New York.
PROF. STOCKWELL, Astronomer, Cleveland, Ohio.
CHARLES LATIMER, C. E., Cleveland, Ohio.

WILLIAM W. WILLIAMS, PRINTER,
245 and 247 St. Clair Street, Cleveland, Ohio.

THE INTERNATIONAL STANDARD.

MAY, 1884.

THE UNVEILING OF ISIS.

IV.

We have thus briefly glanced at the lives and deeds of these three great characters of history, and shall now pass on to a general view of the historical side of this sublime question.

One grand and remarkable fact in the peopling of our country is that each colony was formed as a church, and each leader called to his work as with the inspiration of heaven. In the words of our great historian, "Every enterprise of the Pilgrims began from God."

"On the voyage they constantly served God, morning and evening, by reading and expounding the Scriptures, by singing and prayer. On the Sabbath day they added preaching twice and catechising; twice they faithfully kept solemn fasts. The passage was pious and Christian-like, for even the ship's company set their twelve and eight o'clock watches with singing a psalm and prayer."

On the ship, as it sped over the ocean toward the west, like an eagle, a branch of the church was formed.

"The worke we have in hand is by mutual consent, through a

special overruling Providence and a more than ordinary approbation of the churches of Christ, to seeke out a place of habitation and consortship under a due form of government, both civil and ecclesiastical. For this we are entered into covenant with God; for this we must be knit together as one man, always having before our eyes our commission as members of the same body, soe shall we keepe the unities of the spirit in the bond of peace. The Lord will be our God and delight to dwell among us as his own people; we shall see much more of his wisdom, power, goodness and truthe than formerly we have been acquainted with. He shall make us a prayer and glory that men shall say of succeeding plantations: 'The Lord make it like that of New England.'"

The early history of America affords many an incident, many a scene that might well be wrought into an effective tableau. One such was the landing of Columbus on San Salvador: the conqueror of a new world, kissing the sands of his conquest, while the color-bearer raises up the banner of Spain, and the wondering savages stand in the background—all this furnishes the material for a heroic spectacle. Another was the landing of the Pilgrims. Hudson's "Great Bird of the Sea," as the poor Indians thought it, majestically sailing up the Hudson, would command the admiration of those of greater knowledge than the untutored savage.

Whence are those mournful Pilgrims, whose story of praise is always like the plaintive notes of the mourning dove—they are the remnants escaped from St. Bartholemew—the Huguenots, landed safe, far out of the reach of persecution. No words of execration or of condemnation escaped from them, but their language was worthy of followers of their Master: "And thou, dreadful prince, whom we once honored as our king, and whom we yet respect as a scourge in the hand of Almighty God, thou also shalt have a part in our good wishes. These provinces which thou threatenest, but which the arm of the Lord protects; this country, which thou fillest with refugees, but fugitives animated with love; those walls which contain a thousand martyrs of thy making, but whom religion renders victorious—all these yet resound bene-

dictions in thy favor. God grant the fatal bandage that hides the truth from thine eyes may fall off! May God forget the rivers of blood with which thou hast deluged the earth, and which thy reign has caused to be shed! May God blot out of his book the injuries which thou hast done us; and while he rewards the sufferers, may he pardon those who exposed us to suffer! O, may God who hath made thee, to us and to the whole church, a minister of his judgments, make thee a dispenser of his favors—an administrator of his mercy!"

At a later day, on a more southern river, we see another grand picture of history. We behold a vessel filled with wondering and awe-struck Friends, a peaceful and charitable community of brave hearts, glide up the Delaware. William Penn is among them. The historian will choose the moment of his landing for the great tableau of this drama. From his manly port and the resolution which his countenance displays, you would take him to be a warrior, if the mild philanthropy which beams from his eyes did not reveal the nature of his professions still more than the simplicity of his garb.

Foremost among the great and good whom the providence of God raised up as instruments for the building of this nation, was this good man, of whom the historian has said: "If any fault can be found with his conduct, it is that his charity was a little too universal—a little too indiscriminate." He was a striking exemplar of Joseph in his purity, in his sufferings, in his portions, for he had two—Pennsylvania and Delaware—two in one, and above all, in that spirit which breathed forth in the words of Joseph: "Now, therefore, be not grieved nor angry with yourselves that ye sold me hither, for God did send me before you to preserve life. He sent me before you to preserve a posterity in the earth and to save your lives by a great deliverance." His whole soul was filled with charity. He felt as Joseph did, that God was with him and that he was an instrument in his hands to do well. His colony established, he sailed for England, but before his departure uttered these remarkable words: "My love and life to you and with you, and no water can quench it nor distance wear it out or bring it to an end. I have been with you, cared over you, and served you with un-

feigned love, and you are beloved of me and near to me beyond all utterance. And thou Philadelphia, the virgin settlement of this province, named before thou wert born, what love, what care, what service and what travail has there been to bring thee forth! O, that thou mayest be kept from the evil that would overwhelm thee, that faithful to the God of thy mercies, in the life of righteousness, thou mayest be faithful to the end. My soul prays to God for thee, that thou mayest stand in the day of trial, that thy children may be blessed by the Lord and thy people saved by his power."

The meeting of the first Congress has been described as awfully solemn. The most eminent men of the various colonies were now, for the first time, brought together; they were known to each other by fame, but were personally strangers. The object which had called them together was of incalculable magnitude. The liberties of no less than three millions of people, with that of all their posterity, were staked on the wisdom and energy of their counsels. "It was such an assembly," says John Adams, who was present, "as never before came together on a sudden errand, in any part of the world. Here are fortunes, abilities, learning, eloquence and acuteness equal to any I ever met in my life. Here is diversity of religious education, manners, interests, such as it would seem impossible to unite in one plan of conduct. The Congress was opened with prayer. The psalter, the 35th psalm for the day, was read the 7th of September, 1774. *Plead my cause, O Lord, with them that strive with me; fight against them that fight against me. Take hold of shield and buckler and stand up for my help. Draw out also the spear and stop the way of them that persecute me. Say unto my soul, 'I am thy salvation.'*" The inspiring words of this psalm spoke the fullness of all hearts present.

"I never saw," continues Mr. Adams, "a greater effect upon an audience. It seemed as if heaven had ordained that psalm to be read that morning. Then Mr. Duché, the minister, struck out into an extemporaneous prayer, which filled the bosom of every man present. Never was a prayer heard with such fervor, such ardor, such earnestness and pathos, and in language so eloquent and sublime—for America, for the Con-

gress, for the province of Massachusetts Bay, and for Boston especially." George Washington was especially devout on this occasion, kneeling while others stood.

The papers of this Congress were pronounced master-pieces of practical talent and political wisdom. Lord Chatham said: "For myself, I must declare and avow that, in the master States of the world, I know not the people or Senate who, in such a complication of difficult circumstances, can stand in preference to the delegates assembled in General Congress at Philadelphia."

Of the long struggle of the colonies that succeeded this first meeting of this Congress, of daring acts in the field and in the cabinet, of the bold Declaration of Independence, and of its electrical effect upon the colonies, we shall not speak now, but pass on to the ever memorable 14th of June, 1777, when Congress resolved "That the flag of the United States be thirteen stripes, alternate red and white; that the Union be thirteen stars, white in a blue field, representing a new constellation."

No more noteworthy instance of retributive justice, under a Divine Providence, can be found than that of the fashioning of our flag by the hands of Elizabeth Griscom, and afterwards by her daughter, Clarissa Claypole, a descendant of Oliver Cromwell. Three messengers—like the three angels who came to Abraham's tent to announce to him that his seed should be as the stars of heaven—three messengers, George Washington and two of his officers, appeared before Elizabeth Griscom, mother of this noble woman, and, authorized by Congress, confided to her skilled hands the making of all the flags—the setting of those stars typifying the seed of Israel restored, which should lead the hosts of the new Israel to victory and to freedom.

**"THOU HAST GIVEN A BANNER TO THEM THAT
FEAR THEE, THAT IT MAY BE DISPLAYED
BECAUSE OF THE TRUTH."**

Is it not a striking coincidence, that upon the shield or coat of arms handed down from century to century to George Washington, and borne to the fight with Saracen by his ances-

tors for the possession of the Holy Land, are to be found the colors of this flag, with a wonderful trinity of stars or cadences, placed there perchance in those early ages, prophetically as symbols of those God-like men to whom, under Almighty guidance, our country owes its existence—Columbus, Luther, Washington?

The Dove. The Swan. The Eagle.
 The Cross. The Trumpet. The Sword.
 The Pilot. The Prophet. The Prince.

The blue blanket of the Covenanters, raised for Christ, Crown and Covenant at that memorable epoch—the downfall of kingcraft in England—was the emblem of heaven, in which a church appeared—the woman clothed with the sun.

Those bright stars which spangled this heaven were the crown of the woman—the twelve united colonies of America brought forth from a church in travail—twelve because two of the colonies counted as one, as did two of the tribes of Israel, and as thirteen apostles were reckoned as twelve.

Those gorgeous stripes came from the streakings of the morning light of the glowing sun, which burst forth at the birth, surrounding and clothing the woman, our freed church: The blue of the fold symbolizing Heaven, Truth, Constancy; the white, Purity, Joy, Light; the red, The Holy Spirit, Creative Power, Heat.

Time and space would fail me to follow the cause of our sacred banner, that

*“Imperial ensign that full high advanced,
 Shone like a meteor, streaming to the wind,”*

through the seven dark days of peril—through its evil hours and its triumphs—to Lexington, to Bunker Hill, to Lake Champlain, to Brandywine, to the glorious field where Burgoyne, “the boaster,” was routed to the tune of “Yankee Doodle”—the same air and words, with little variation, as were flung as a lampoon at Cromwell and his yeomanry in military uniform, with hat and feather, as they marched into London; played in derision by the British at Lexington, and returned by our men with interest, when Burgoyne’s soldiers stacked their arms. Again to Germantown, to Princetown, to Valley Forge, with

its bloody footprints, the Gethsemane of the Revolution, to the great sea fight of the famous John Paul Jones on his Ironsides, to Stony Point, to the gloomy hour of betrayal by one of the twelve, and to the final victory at Yorktown, when the combined forces of HEAVEN AND OF EARTH crowned the Nation's emancipation from tyranny.

Then the great war drama closes, with the remarkable spectacle of a whole army, with its leader, assembling on the field and kneeling in prayer of thanks to Almighty God for this surprising interposition in its favor.

In Philadelphia another striking scene presents itself,—the Congress of the Nation marching in solemn procession to the Dutch Lutheran church to offer up thanks to God for the mighty deliverance of the people.

Later, at the invitation of the French embassy, upon the occasion of the glorious success of the allied armies, Congress, the assembly of Pennsylvania, and principal persons of various orders, assembled in the Catholic church in Philadelphia, where a most remarkable address was delivered by Abbé Bandole, solemn prayers offered and a Te Deum sung.

Thanks, noble France, who, though you gave us those scourges of Almighty God—Charles IX and Louis XIV—gave us a Calvin, a Fenelon, a Lafayette, a Rochambeau, a Louis XVI, born to repair the breach, yet to expiate on the scaffold the sins of his fathers. Thanks for your thinkers—thanks for your statesmen—thanks for your lofty men of arms, for without these WE WOULD NOT HAVE BEEN.

And among the gathering of the nations, thanks, blessed little Holland, the refuge and protector of the persecuted! Thanks, brave, oppressed Poland, for a Kosciusko! Thanks, favored Germany, for a Huss, a Luther, a Copernicus, a De Kalb, a Steuben! Thanks, glorious Italy, for a Christopher Columbus, a Galileo, a Michael Angelo, a Dante. Thanks for your pilot, your poet, your philosopher! Thanks, proud Spain, for a Torquemada, a Charles V, an Isabella! Thanks, old England—our good mother—for a Wickliffe, a Cranmer, a Knox, a Charles I, a Cromwell, a Milton, a Pitt, a Burke! Thanks, prophets! Thanks, persecutors! Thanks, martyrs!

Thanks again to you, good mother, that you cast us out in our adversity; and, above all, thanks to God who saved us from your bondage, when you would have claimed us in our prosperity.

Let us never hereafter speak lightly of our noble forefathers, to whose greatness of soul, undaunted heroism and undoubted piety, we owe the temple of LIBERTY which shields us to-day.

If, in a frivolous moment, the word Puritan or Quaker should be spoken in derision, let us ask ourselves: "Are we able to be baptized with the baptism with which they were baptized?"

Take to heart these words of Alexander Everett, a truly representative American, whom I knew and honored as a boy:

"Scion of a mighty stock,
Hands of iron, hearts of oak,
Follow, with unflinching tread,
Where the noble fathers led.

Craft and subtle treachery,
Gallant youth! are not for thee;
Follow thou, in words and deeds,
Where the God within thee leads!

Honesty, with steady eye,
Truth and pure simplicity,
Love that gently winneth hearts,—
These shall be thy only arts.

Prudent in the council train,
Dauntless on the battle plain,
Ready, at the country's need,
For her glorious cause to bleed.

Where the dews of night distil
Upon Vernon's holy hill;
Where, above it, gleaming far,
Freedom lights her guiding star;

Thither turn the steady eye,
Flashing with a purpose high!
Thither with devotion meet,
Often turn the Pilgrim feet!

Let the noble motto be,—
God—the Country—Liberty!
Planted on religion's rock,
Thou shalt stand in every shock.

Laugh at danger far or near !
Spurn at baseness, spurn at fear !
Still, with persevering might,
Speak the truth and do the right !

So shall peace, a charming guest,
Dove-like in thy bosom rest ;
So shall honor's steady blaze
Beam upon thy closing days.

Happy if celestial favor
Smile upon the high endeavor ;
Happy if it be thy call
In the holy cause to fall.

Thus we have traced our God-given ensign through the ages. We have read of it in the pages of prophecy and the stars of the heavens. Man, in all his weary march across the sands of time's desert, in the long, toilsome journey of the race through the black night of the middle ages, burdened by error, bigotry, persecution and oppression; in his toilsome march through the forests of Gaul and Germany, on his perilous expeditions in the wild North sea, in his voyage of fear and terror across the wide Atlantic, yea, even into the confines of a new world, amid danger, death and desolation, such as to make the on-looker despair of the race, adown the pages of history may we read that this glorious prophecy has been followed. Our glorious banner comes from the stars to plead with man "be free." Monuments may consecrate, arches of triumph may perpetuate, man's love for LIBERTY, but in the folds of the American banner is she herself an ever constant spirit, in the stars and stripes—a *goddess* revealed. Oh, America, ever and forever cherish, defend, adore thy heaven-born banner, for the prophecy of its coming fell from Jehovah's lips.

CHARLES LATIMER.

THE ALTAR AND PILLAR TO JEHOVAH.

IV.

The builder of such "an altar to Jehovah" as the Great Pyramid must have known the name of the Being to whom he built it, and his inscription on its pure white surface could not have been, "To the Unknown God," but is most likely to have been the original of the subsequently familiar Hebrew inscription, "Sacred to Jehovah." This is said to be a more literal translation of the original than "Holiness to Jehovah." Moreover, whoever looks upon the Great Pyramid as built "for a witness to Jehovah of hosts in the land of Egypt," ought to look upon it as built by a patriarch subsequent to Jacob; for God said to Moses, "I appeared unto Abraham, unto Isaac, and unto Jacob, by the name of God Almighty,^g but by my name JEHOVAH was I not known to them."—(Ex vi. 3.) We must, therefore, either give up our idea that the Great Pyramid was built expressly as "an altar to Jehovah," or else admit that it was built by Joseph, the first heaven-inspired man who could have dedicated it to Jehovah by name, as well as the only one of whom the Bible records both the opportunity and the wisdom to have built it. Confirmatory to this conclusion is the remarkable fact that Jacob, the last inspired man before Joseph, named his last altar "EL-BETH-EL" (*God of the House of God*), and that Moses, the first inspired man after Joseph, named his first altar "JEHOVAH-NISSI" (*Jehovah my banner*). If ever an altar before this bore the name of Jehovah, it must have been the "altar to Jehovah in the midst of the land of Egypt." Moses was Joseph's standard-bearer (figuratively speaking, of course), and bore on his banner the name in which Israel was to vanquish the foes of righteousness and truth.

In view of the military significance of this first altar of Moses, and in view of the fact that the Great Pyramid's stair-like form of construction was either "battlement-wise" or "altar-wise,"

whichever one might choose to call it, it will hardly be said that I have abandoned the advocacy of the Great Pyramid as "an altar to Jehovah" in my endeavor to show that it is referred to in the Bible under the name of "Migdol," the Great Tower. When the purport of the further mention of Migdol in the sacred Scriptures shall have been considered, it will be convenient to show clearly, both rationally and inspirationally, that the Great Pyramid's character as a tower and its character as an altar are perfectly consistent with each other. That Migdol still exists, being identical with the Great Pyramid and identified with the adjacent region round about it, has been pretty well proven, I think; but the Bible's mention of the place a second, a third and even a fourth time, will be sufficient to either overthrow or confirm my previous conclusion, by locating the Great Tower on the Gizeh rock, or else by showing it to have been situated elsewhere. Truth alone can give unanimity to several independent witnesses; therefore, "Out of the mouth (not mouths) of two or three witnesses every word shall be established."

Migdol is commonly supposed to have been a fortress, with a garrison, somewhere on the Isthmus of Suez; and "between Migdol and the sea" is commonly supposed to have been between this fortress and the head of the Gulf of Suez, which was crossed by the Israelites through the parting of its waters, from Egypt to the Sinaitic Peninsula, although, by their supposed crooked route out of Egypt, they could have reached Mount Sinai much more conveniently without crossing the sea at all. Against this roundabout way to the western shore of the Gulf of Suez, let me here add this fatal objection: that the "six hundred thousand men on foot," with their still larger number of women and children, and with their flocks and herds, could not possibly have traveled it in three days. By the straight route from Ra-Meses to the sea, each day of the "three days' journey" was a little over twenty-five miles—as far as such a pedestrian caravan could travel in that length of time, however great its haste to escape from rapacious pursuit. "Succoth" and "Etham," in Egypt, were mere names of the first and second days' encampments. That the exodus was due

east, on the latitude parallel of the middle of the three great pyramids, is in admirable harmony with Mr. Robert Ballard's "Geodesic Theory" of the Pyramid of Egypt, which rests, like the military theory which Lieutenant Totten ought to propose, on the impregnable foundation of necessity. (See INTERNATIONAL STANDARD, Vol. II, p. 31.)

And now in regard to the supposed situation of Migdol on the Isthmus of Suez. This "wide gate" of the "broad road" from Canaan down into Egypt was, and still is, a desert waste, including a few spots fertilized by irrigation, without a rock for a tower to stand upon; and if the Great Tower was anywhere in that region of sandy foundations, it would not have been mentioned by Jeremiah as existing in his time, one thousand years after the mention of it by Moses. Indeed, from Egypt's deserted border land on the east to its populous interior, not a rock greeted the traveler until he came to the rock of Gizeh, in the very *midst* of Egypt; and on this rock the prototypal shepherd of Israel planted his Great Tower of the Flock so firmly that it "remaineth until this day," and is likely to remain till the last jot and tittle of its prophetic teaching shall have been fulfilled.

After the mention of Migdol in the description of the exodus, the next mention of it is in the forty-fourth chapter of Jeremiah, which begins with an address to Jews dwelling "in the land of Egypt at Migdol, and at Tahpanhes, and at Noph, and in the country of Pathros," threatening them with the judgments of heaven for "burning incense to other gods in the land of Egypt." The depth of the offence must have lain in the region where the gods of Egypt were chiefly worshiped, beginning with Migdol, in the *midst* of Egypt, and including the capital city, Noph, or Memphis, on the south, and the royal city a little to the north of the Gizeh pyramids, *i. e.*, Tahpanhes, of which "the decayed and filthy village of Gizeh, once adorned with magnificent palaces," appears to be the ruin, and including Pathros, the nativity of the Pathrusimite branch of the Mizraimites, whose chief city was Beth-Shemesh, or Heliopolis, the city of the sun. In this catalogue of idolatrous places, the one in the absolute *midst* of the land of Egypt,

whether the Great Sphinx was what Professor Smyth thinks it, "the biggest idol in the world," or not, should naturally be the one first mentioned. According to this, Migdol was not a solitary spot on the Isthmus of Suez, but was the whereabouts of the Great Pyramid of Gizeh, and took its name from this altar to Jehovah in its original character of the Great Tower.

Jeremiah's address to the idolatrous Jews in Egypt was in person, he being there with them though against his will; and the story of his doings there identifies Tahpanhes with Gizeh, and Pathros with the country of which the chief city was Beth-Shemesh, the Egyptian Baal-beck, where Baal and Astarte were worshiped under the names of Isis and Osiris. As to Noph, no one denies that it was identical with Memphis. Thus the entire region occupied by "the remnant of Judah" in Egypt, who were brought down there by Johanan to save them from being added to the captivity in Babylon, did not exceed twenty miles square, with Migdol in the midst. The objective point of the immigration was Tahpanhes, and thence it spread to the neighboring cities. The record of Jeremiah, the prophet, by the hand of Baruch the scribe, is this: "Thus came they to Tahpanhes. Then came the word of Jehovah unto Jeremiah in Tahpanhes, saying: Take great stones in thine hand, and hide them in the clay in the brick-kiln, which is at the entry of Pharaoh's house in Tahpanhes, in the sight of the men of Judah; and say unto them, Thus saith Jehovah of hosts, the God of Israel: Behold I will send and take Nebuchadnezzar, the king of Babylon, my servant, and will set his throne upon these stones that I have hid: and he shall spread his royal pavilion over them. And when he cometh, he shall smite the land of Egypt, and deliver such as are for death to death, and such as are for captivity to captivity, and such as are for the sword to the sword."—(Jer. lxiii. 7-11.) I suppose that the "great stones" were three, to represent the tribes of the house of Judah—Judah, Levi and Benjamin. I suppose, too, that they were "whole stones," like those by which Joshua and Elijah represented the thirteen tribes of Israel in their altars to Jehovah in the land of Canaan. That the stones hidden by Jeremiah near the palace of Pharaoh-Hophra, in Tahpanhes,

represented the Jews in a royal city not far from the capital city of Egypt, to which Nebuchadnezzar was to carry his conquest, is very evident; and if Tahpanhes was not far from Noph, it must have been very near to the situation of the Great Pyramid, which I take Migdol to have been. Thus Tahpanhes is identified with the once palatial city of Gizeh, which less than twenty years ago was not so "decayed and filthy" but that the Khedive of Egypt had a palace there. That Pathros can be as clearly identified with the country in which Heliopolis was situated I cannot say, but it seems probable from this: "Then all the men which knew that their wives had burned incense unto other gods, and all the women that stood by, even all the people that dwelt in Pathros, in the land of Egypt, answered Jeremiah, saying: As for the word which thou hast spoken unto us in the name of Jehovah, we will not hearken unto thee; but we will certainly do whatsoever thing goeth forth out of our own mouth, to burn incense unto the queen of heaven, and to pour out drink offerings unto her, as we have done, we, and our fathers, our kings, and our princes, in the cities of Judah, and in the streets of Jerusalem."—(Jer. xlv. 15-17.) In Egypt the "queen of heaven," Isis, the wife of Osiris and the mother Horus, was the supreme divinity, the "one and all things, past, present, and to come;" and the principal temple and image-worship of this Egyptian trinity was in Beth-Shemesh. Therefore, "when the women burned incense and made cakes, and poured out drink offerings to the queen of heaven, it was not without their men;" and therefore Jehovah by the mouth of Jeremiah, speaking of Nebuchadnezzar, said to them and to their subordinates in this idolatrous worship: "He shall break also the images of Beth-Shemesh in the land of Egypt; and the houses of the gods of the Egyptians shall he burn with fire." All this throws light on the whereabouts of Migdol, pointing to near midway between the capital city of Egypt and the city of the sun.

The next mention of Migdol is in the forty-sixth chapter of Jeremiah: "Declare ye in Egypt, and publish in Migdol, and publish in Noph, and in Tahpanhes: say ye, Stand fast, and prepare thee; for the sword shall devour round about thee."

Here again Migdol is placed first, and in the same relation to Noph and Tahpanhes, seeming to indicate its position between the two, with Noph, which was undoubtedly Memphis, to the south of it, and with Tahpanhes, if this was Gizeh, to the north of it. On this theory the proclamation of the war declared against Egypt comes to the right places in the right order, *i. e.*, 1st, to the place of the Great Tower, of the treasury strongholds, the military headquarters; 2d, to the capital city, where the Pharaoh sat in state and administered the laws; and 3d, to the city where he held his court and his royal entertainments, and where he might have enjoyed domestic life to his heart's content but for his ambitions and the enmity of rival princes. May not the name Tahpanhes have been bestowed upon this royal city by the Pharaoh of Solomon's day, in honor of his motherly queen, Tahpenes, whose sister he gave in marriage to that enemy of the house of David, Hadad the Edomite? I incline to think so, because the name does not occur as that of a place until after the story of the queen who bore it, which we find in the eleventh chapter of 1st Kings. In the French national library is a book on good morals and manners by Ptah-Hotep, an old Egyptian courtier of the fifth dynasty. I therefore incline to think that the name of the Egyptian queen, and of her royal residence, Tahpenes or Tahpanhes, might be more properly written Ptah-Penes, showing an etymological relationship to Ptah, the oldest of the Egyptian gods, and Menes or Manes, the first king of the first dynasty, who instituted the worship of Ptah, and built him a magnificent temple in Memphis. If there is any truth in this idea, Migdol, between two cities so intimately connected as Noph and Ptah-Panhes, is not hard to find.

It is mentioned once more, and in a way, I think, to identify it no less plainly with the situation of the Great Pyramid. In the sixth verse of the thirtieth chapter of Ezekiel we read concerning Egypt and the Egyptians: "From Migdol to Syene shall they fall in it by the sword, saith the Lord Jehovah." This is according to the marginal reading, but the *A. V.* is quite as good if we substitute "to" for "of," to make sense, giving us "From the tower *to* Syene," instead of "From the tower

of Syene shall they fall in it by the sword." The prophet evidently intended the reader to understand that the Egyptians were to fall, like corn before the reapers, from one end of the fat valley to the other, beginning with the Great Tower at the apex of the delta, and ending with Syene, in the region of the cataracts, whence they brought the granite called "Syenite," so conspicuous in their obelisks and in the images in their temples of the gods. It is as if one were to prophesy the destruction of the inhabitants of the valley of the Mississippi, from the Crescent City to Cairo. He would mean, not from some obscure cross-roads in Alabama to Cairo, but from New Orleans, on a bend in the river near the head of the delta, to Cairo. So, when Ezekiel prophesied the destruction of the inhabitants of the valley of the Nile, "from the Great Tower to Syene," he meant, not from some obscure out-post on the uninhabited Isthmus of Suez to Syene, but from the Great Citadel, in the midst of the populous cities at the head of the Delta, to Syene.

My idea of the primary object of the pyramids of Egypt is this: That each one was built for the special purposes of a citadel, and that these were two: 1st, that of a stronghold for the perpetual security of the royal treasures, and for the safety of the royal family in times of emergency; and 2d, that of a military vantage-ground, from whose top to watch the approach of enemies, and from whose battlemented sides to hurl at them the weapons of warfare. As to the most natural reason for so many of them, I take it to be this: That on the death of the Pharaoh for whom the Pyramid was built, it was converted from a tower into a tomb, by the religio-military order of which he had been the head, his embalmed body being placed in a granite sarcophagus, and therein slid down the descending passage into the subterranean chamber, with the stately and solemn services becoming the occasion, after which the top and battlemented sides of the tower were builded upwards and outwards, from the proportions of the altar of whole stones into the more exalted π proportions of a pyramid proper, and finished with the capstone and casing stones, all without the sound of a hammer. This transformation from a tower to a

tomb necessitated the building of another tower for the treasury and defensive purposes of the dead king's successor; and when this other tower had in like manner been converted into a shrine sacred to the memory of the heroic virtues and achievements of the deceased, it gave occasion for still another. In this way the multiplication of pyramids only ceased with the complete subjection of Egypt to her foreign invaders.

The construction "in steps, battlementwise," in which, no doubt, all the pyramids of Egypt were like the Great Pyramid, does not satisfy our idea of the safe and commodious ground on which the warriors needed to stand in actual warfare. Great terraces, like those of Birs Nimrud, as described by Herodotus, approach much nearer to our idea of what should be, and satisfy us altogether if we are allowed to defend the standing-ground of each with a rampart. That such larger terraces, consisting of flat-roofed blocks of houses, were built upon the smaller terraces, as upon the sides of a trap-rock mountain, and that their interiors served for barracks, while their belligerent tops were reached by the smaller terraces on which they were built, will be shown by abundant evidences hereafter. On the tops of these great terraces were arranged the munitions of war, including, I suppose, pyramidal heaps of round stones, like those of cannon balls beside the hurling implements of modern warfare. Such pyramidal mounds of round stones seem referred to in the words, "Cast a mount against Jerusalem," which in the margin are made to read, "pour out the engine of shot" against Jerusalem.—Jer. vi. 6.) Also in the words, "He shall make a fort against thee, and cast a mount against thee," where for the last part of the passage the margin substitutes "pour out the engines of shot" against thee.—(Ezekiel xxvi. 8.) If I am right in this comparison, the little pyramidal mounds of iron balls in our forts and arsenals, and on board our ships of war, are lineal descendants of a very venerable ancestry, and may be taken as symbols of the commonwealth they are intended to defend, answering, in a manner, to the pyramid on the reverse seal of the United States.

Such was evidently the significance of the altar built by Moses, probably of whole stones, after the battle with the as-

sailant Amalekites, when God said, "I will utterly put out the remembrance of Amalek from under heaven." The statement is this: "And Moses built an altar, and called the name of it JEHOVAH-NISSI" (*i. e.*, *Jehovah my banner*); "for he said, Because the hand of Amalek is against the throne of Jehovah, therefore Jehovah will have war with Amalek from generation to generation."—(Ex. xvii. 15, 16.) I even think that the singular means by which the victory over Amelek was accomplished bore a sort of representative relationship to the three great pyramids of Gizeh—Moses, on his stone, answering to the middle pyramid, "A-Mosis"; Aaron, staying up the hand of Moses "on the one side," answering to the right hand pyramid, "In-Aron"; and Hur, staying up the hand of Moses "on the other side," answering to the left hand pyramid, "Ur," or "Aramæus." In view of these reminiscences of Migdol, and in view of the attribute of Jehovah as "a man of war" (Ex. xv. 3), saying that the character of the Great Pyramid as "an altar to Jehovah" is consistent with the idea of its having been originally known as the Great Tower, and with its having continued to bear that name in the days of Moses and the prophets, is both scriptural and reasonable. Indeed, the Great Pyramid, as newly revealed, is to a goodly number of modern Israelites what "Jehovah-nissi" was to Israel of old; for now, "when the enemy cometh in like a flood, the spirit of Jehovah lifteth up a standard against him," and on its banner we see inscribed a figure of the "altar to Jehovah in the midst of the land of Egypt," signed with the sign of the cross, with the motto, "*In hoc signo vinces.*" "The treasures of Egypt," in which the Pharaohs trusted, but which Moses, in view of "the recompense of reward," esteemed of less value than "the reproach of Christ," made Egypt an object of intense cupidity to "the kings of the East." It was, therefore, a military necessity with the Egyptians to locate their capital city and their strongholds, their last resort for the safety of their kingdom, on the west bank of the Nile, placing the river between them and their most powerful enemies, and keeping their transports moored on the same side with their defences. Moreover, through all time, battle-grounds have been burial-

grounds, and therewith they have been places for monuments to immortalize dead heroes. Gradually the great battle-ground of Egypt became a vast necropolis, and the strong towers, on whose battlemented sides the warriors bled and died for the preservation and glory of their country, became monuments of the representative heroes that slept beneath them. In ancient Egypt, as in all other countries and times, the greatest hero was the rightful king; and kingship, by the law of heredity as well as by acquisition, represented the heroism of the people. To Jacob God said: "Thy name shall no more be called Jacob, but Israel; for as a prince hast thou power with God and with men, and hast prevailed." To such an Israelite as the inheritor of the birthright, the translation of the battling tower into the monumental tomb could easily signify conversion of the altar of sacrifice on which the Christ was to lay down his life for the salvation of his kingdom into an altar of witness, "a memorial forever" of his heroic deed. In this case, the altar of sacrifice was the kingdom of David, consisting of the thirteen tribes of Israel, represented by the altar of whole stones: and the altar of witness into which it is being converted is the kingdom of the Christ, the inheritance of the Son of David, consisting of the twelve tribes of mankind, represented by the twelve foundations of the Holy City, inscribed with the names of the twelve apostles of the Lamb, and constituting the Great Pyramid of the world.

A so-called Philistian, a worshiper of Jehovah, so influenced Cheops and Cephren as to be the actual ruler of Egypt, in their stead, for eighty years, even to the extent of keeping closed the temples of the Egyptian gods, in opposition to the powerful influence of the Egyptian priests during that time, and for forty-two years after. Is it too much to believe that such a man was inspired with an insight into the life of man on this planet, from the beginning to the end of it, including the world of truth involved therein? If not, it is not too much to believe that he was endowed with the ability to embody it in the parts and proportions of the Great Pyramid, making its situation "in the midst of the land of Egypt" commemorative of "the tree of life in the midst of the garden;" making the

excavation of its subterranean chamber, under the baleful influence of the constellation of the dragon, symbolic of the fall of man and his loss of Paradise, through the subtlety of "that old serpent, the devil;" making the Sakkara stage of its development representative of the altar of their people and their God, on which the Christ and his disciples were to bleed and die in mortal conflict with the powers of darkness; making the conversion of the tower into a monumental tomb, at the death and expected apotheosis of the Pharaoh for whom it was ostensibly built, significant of the "altar under which are the souls of them that were slain for the word of God and for the testimony which they held;" and making its state of finish and perfection, in which it looked like a snow-white tent "let down from heaven by the four corners," prophetic of the descent of the Holy City, New Jerusalem, "prepared as a bride adorned for her husband," offering "to him that overcometh" the long-lost "right to the tree of life, in the midst of the Paradise of God," by entering in "through the gates into the city." Moreover, if the Great Pyramid represented the history of man on the globe, from the fall to the restoration, from infernal to angelic, or at least from savage to saintly, it represented the *microcosm* in the generic and also in the individual sense of the word, from its entrance into this world to its translation into the next; and it must needs have represented the *macrocosm*, in the sense of the world on which we live, from its igneous beginning to its paradisaical ending, and in the sense of the material universe, from its nebulous and chaotic condition to that order and harmony which make the stellar heavens a symbol of the angelic and divine.

This complex individuality of the Great Pyramid freely admits of every intention claimed for it, not excepting, in times of peace, that of an astrological observatory, in the character of a watch-tower devoted to the observation of the stars, like that of the wise men who came from the East to Jerusalem, and even to the manger in Bethlehem, guided by the star of "Him who was born King of the Jews." But that so many prodigious pyramids were built, each for casting the horoscope of a particular king, when it was sufficient to have served such a

purpose for a whole dynasty of kings, and when the horoscope could have been as well cast without any pyramid at all, I can no more believe than that each was built for the tomb of a particular king, to the exclusion of the legitimate inheritors of his throne, and in defiance of all artistic and poetic ideas of beauty and significance in the architecture of a mausoleum. Military necessity, first and last, occasioned by the possession of vast wealth in precious stones and metals, by danger to the royal person and family in the straitness of a siege, by the convenience of a vantage ground immediately outside the priceless objects to be defended, and by conversion of the strong tower into a grand monument in honor of one but temporarily vanquished in a conflict with death, seems to me the only rational explanation of such a long line of prodigious pyramids, extending, as they do, from the northernmost limit of a solid base to stand upon, southward, against Theban and Ethiopian invasion, and confronting the Assyrian and Babylonian contestants for the dominion of the world on the east. In a truly scientific and philosophical view of the matter, the Great Pyramid is to be regarded as one of the pyramids of Egypt, explainable in the same way with the rest, but as one of them in the same sense that the Christ, the Son of David, is one of the multitude of mankind, to be revealed as "the Christ, the Son of the living God," when the Israelite indeed "shall see heaven open, and the angels of God ascending and descending on the Son of Man."

J. W. REDFIELD.

THE HISTORY OF REDEMPTION.

The special object of this article is to show that the history of redemption, as typified by the feasts of the Lord in the Jewish year, according to the law of Moses as recorded in the twenty-third chapter of Leviticus, is symbolized by and in the Pyramid. If this can be shown, we then indeed have Job's wish: "Oh, that my words were now written! Oh, that they were printed in a book! that they were graven with an iron pen and lead [cement?] in the rock forever! for I know that my Redeemer liveth, and that he shall stand, at the latter day, upon the earth" (xix. 23-25). We have both—the printed and the stone book; and both record just what Job had engraven, as it were, upon his soul, to keep him in his hour of extremity—the final and complete salvation from sin and life to enjoy it forever.

"The circular theory," as it has been called, as related to the Pyramid, was suggested to the writer by the diagram in *The Approaching End of the Age*, at page 458, while reading that able work. This theory shows the complete history of the redemption of Israel, even to the specified days as recorded in the chapter referred to, by the aid of additional light given the writer on the passage-chronology, and is the antitypical year of Leviticus xxiii, as has been shown by Mr. Guinness. This able writer, however, has only shown the analogy between the months of millenaries in one scale, and the months of the Jewish feasts in the other, without any attempt to particularize on the likeness of the days of one scale to the same days in the other; and whatever appears in this article on the correspondence of the particular days mentioned in the type, is entirely original with me.

Now, it seems very evident that, if we have the antitypical year, the antitypical days must be there; for those days are especially what marked the seventh month of the year, and this month, as the liberating and harvest month, is the goal of the hope of Israel. That those days are there, I think I can show.

Mr. Guinness has shown that the most probable duration of our Lord's life on the earth was thirty-three years, seven months and seven days, elsewhere (*Our Rest*, November and December, 1880) shown to be 33.6 years. Mr. Guinness has also shown that, if we construct a year on the scale of 33.6 years for a day, a millenary corresponds very nearly to a month in the type, 1008 years being just a month of 30 days. This great year is what, it is claimed, is built in the Pyramid by its symbols.

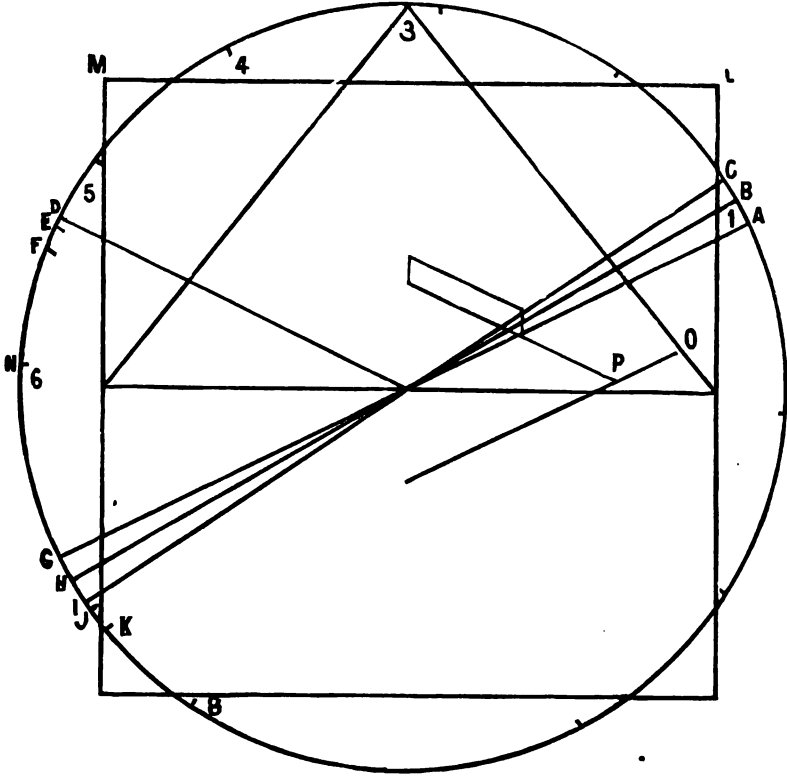
The passover in the type has not its chronological likeness in the history of redemption, but chronologically reverts to the exodus of the children of Israel from Egypt, and is so stated in the Scriptures. But the antitypical passover has its proper place in the redemptive history, occurring in the first part of the fifth month. And how fitting this is when compared with seed-time and harvest; for there was the sowing—creation, then in the fifth month, the first ripe fruit—our passover, fifty-six days thereafter the first ripe fruits, and then the harvest, near the middle of the seventh month. Redemptive history, then, is analogous to the sowing and harvest year.

The first chronological feature in the type relating to the history of redemption is the fiftieth day after the first Sabbath after the passover, then the memorial of blowing of trumpets in the first of the seventh month, and then the tenth and fifteenth days of the seventh month. It is designed to show that all of these features in redemptive history are built in the Pyramid as surely as symbols can show them, though not in the order here given; for in the antitype the memorial of blowing of trumpets comes first after the passover, and then that memorable fiftieth day. Time will tell the truthfulness or erroneousness of the symbols.

This theory has been called very questionable because of the indefiniteness of the angles of the passages, but I think it can be demonstrated that the angles any one may use (within the limits of Prof. Smyth's trials) will not in the least effect its truthfulness. In doing this it will be necessary to make use of the following diagram:

The reader will at once recognize B, at an altitude of thirty degrees, as the angle of the celestial pole, and A and C as the

lower and upper culmination of the pole star in its course around that celestial centre. G, H and I are A, B and C extended as diameters of the circle, suggested by the continua-



tion of the descending passage through the base of the Pyramid. A rises on the same angle as the entrance passage. D is a line drawn from the centre of the base to the circumference of the circle, suggested by the ascending passages, and rises on the same angle as the first ascending passage.

To demonstrate this question in the way proposed, we will imagine the circle of the diagram subdivided into 360 degrees or days; then we will assume that A rises at an angle of $26^{\circ} 44'$ (Mr. Muir's computation), and D at $26^{\circ} 18' 10''$; between these two points are $126^{\circ} 57' 50''$; or, in other words, D would point to the 127th day from A. A points to the creation of

Adam, and his first day in this circle was a Sabbath. "And on the seventh day God ended his work which he had made; and he rested on the seventh day from all his work which he had made. And God blessed the seventh day, and sanctified it, because that in it he had rested from all his work which God created and made."—(Gen. ii. 2, 3). Then, by subtracting one from 127 and dividing by 7, we ascertain that D is a Sabbath in this antitypical year. This is the day of our Lord's birth, for as the first ascending passage leads to it in the Pyramid, the angle of that passage leads to it in the circle. Now, add one (for this was the exact length of his life on the earth), and we have for our passover the first day after a Sabbath, as indicated by E. The next feast, after all the service connected with the passover, occurred on the fiftieth day after the first Sabbath after the passover. In the scale we are considering, the first Sabbath after the passover, which occurred at F, was six days later than the passover, which occurred at E; counting, then, fifty degrees or days from F, we are brought to the day marked by H. Let me prove this. From A to G are just 180 days, and as H marks the fourth day ($3^{\circ} 16'$) from G, so H is the 184th day from A; then, as there are 128 days from A to E, and yet six days from E to F, we have 134 from A to F; now the fifty days from F to H make 184, the number from A to H. But this is only one side.

We next assume that the rise of A is $26^{\circ} 18' 10''$, and that of D is $25^{\circ} 49' 15''$ (Mr. Muir's computation again), the two extremes the other way, and then the distance between the two is $127^{\circ} 52' 35''$, or D marks the 128th day from A. We have already seen there are 134 days from A to F; then, as there are 128 days from A to D, from A to E would be 129, leaving five days intervening from E to the end of the next Sabbath at F. Counting fifty days from F, we reach the day marked by H; for 134, the number from A to F, and fifty, the number from F to H, are 184, the number of days we before ascertained there were from A to H.

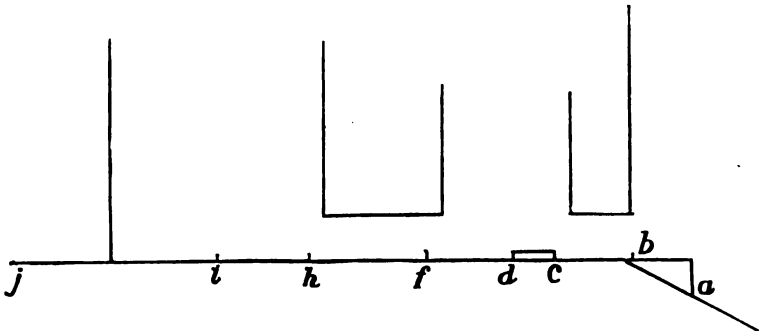
I am very sure of one thing, if it was a mathematical problem, and the demonstration was as explicit as the foregoing,

every member of the Institute would hail it with joy. But I do not expect this in regard to a proposition of this kind.

G marks the close of the sixth and the beginning of the seventh month in this antitypical year. Of the type, we read: "Speak unto the children of Israel, saying, in the [seventh month, in the first of the month, shall ye have a Sabbath, a memorial of blowing of trumpets, an holy convocation. Ye shall do no servile work therein, but ye shall offer an offering made by fire unto the Lord." And we see the antitype of this in the growth of Britain and the rise of this nation before and at the time of the Revolution. Not full liberty, but "a memorial of blowing of trumpets," and the memorial has been on the increase.

H is the day in which the two antitypical wave loaves, the first fruits unto the Lord from among men, are to be offered. This day closes in 1917 A. D., if we use 26° 44' for A and 26° 18' 10" for D; but if we use 26° 18' 10" for A and 25° 49' 15" for D, it closes in 1886 A. D. Any intermediate points for A and D would vary the close in proportion to the change made. No more important day than this occurs to the church, which is the body of Christ, the antitypical first fruits; but there are two more days in this seventh month that are of great importance to Israel, which we will now consider.

Before continuing the demonstration, we will have to turn to the grand gallery, the ante-chamber, the king's chamber, and their connecting low passages, and in our investigation will make use of the diagram below, to make clear my meaning.



It is chronicled of the ante-chamber's north wall: "It is

rough with pick-marks," and it is believed it is for chronological purposes by showing a displacement. The amount of displacement is shown by the position of the raised granite, cd, in the floor of this chamber. The north wall, then, for chronological purposes only, would stand at c, the north edge of the raised granite, and the south wall at f, thus placing the chamber 13.22 inches south; and this is its true chronological position. This places the north wall of the king's chamber at h. The ante-chamber is displaced for two purposes,—one to show a mathematical problem, and the other to show a Biblical statement in connection with chronology. The latter is the statement that "those days should be shortened." The fact that 13.22 inches of this floor is limestone, and the succeeding granite one is raised, shows it does not properly belong to this chamber, but that the chamber has been set over it by displacement. But if the north wall of this chamber belongs at c, why did not the raised granite extend to f? This surely would have been the case if a continuous chronology through this chamber and onward had been intended, or had been the only object. The reason it did not extend to f was to show the true chronological length of the low passage to the king's chamber, which is from f to i, 168.96 inches. We accordingly, therefore, place the south wall of the ante-chamber at d, and then, by expansion, as it were, we lengthen the raised granite to its true chronological length of 116.26 inches, which places the south edge at f where the south wall chronologically belongs. In doing this we place the king's chamber in its true chronological position, with its north wall at i, and the south wall at j, 68.96 inches farther south, 82.18 inches of displacement in all, for this chamber.

I think one thing will be admitted. Had the architect designed to show this displacement of chambers and passages, a more clear and simple plan could not have been devised. It is decidedly unique.

We are now ready to see how this is related to the circle, and to show that we are not necessarily confined to one set of angles, although I believe there is one set intended, and that it lies between those we are at present using.

From the beginning of the grand gallery to f, measured over the step, is 2091.98 inches, or years. From D to J is 2084.41 years; for assuming that our radius line at D is at an angle of $26^{\circ} 18' 10''$, and G at $26^{\circ} 44'$, we have $53^{\circ} 2' 10''$ from D to G, then add 9 degrees and there are $62^{\circ} 2' 10''$ from D to J, the close of the ninth day of the seventh month of this great year, and this multiplied by 33.6 produces 2084.41. Now, as we have already seen that from the beginning of the grand gallery to the south wall of the ante-chamber, rightly located chronologically at f, is 2091.98, and as 2084.41 is the close of the ninth day, f is in the tenth day, thereby marking it in a very definite and pyramidal manner.

But suppose D is at $25^{\circ} 49' 15''$ and G at $26^{\circ} 18' 10''$, their sum would be $52^{\circ} 7' 25''$; then add 9 degrees to bring us to J, and we have $61^{\circ} 7' 25''$; this multiplied by 33.6 gives us 2053.75 years to the close of the ninth day. From the beginning of the grand gallery to f, measured through the step, is 2063.58, or, if the hypotenuse be reckoned from a to b, about 2066; so that, as 2053.75 is the close of the ninth day, f would be in the tenth day, and marking it in as definite a manner as before.

It may be said by some that the beginning of the ante-chamber, rather than its close, would mark the tenth day, it being the day of atonement; but I wish to show this is not the case; that the position of the south wall, in relation to the raised granite, speaks, symbolically, the language of the Scriptures concerning this day. In Leviticus, in the chapter before referred to, they were told to afflict their souls and offer an offering made by fire, and that the soul that would not be afflicted should be cut off from his people. Now, if the south wall marks the tenth day, what does the low passage to the king's chamber say? Be afflicted. This is self-imposed; for as the Christ was made perfect through suffering, so Israel must be in like manner. As the symbol shows the low passage was shortened or cut off, so it says: "Be afflicted or be cut off;" and it will be a cutting off indeed, for this is the reality of which theirs was only the type.

The fifteenth day of this seventh month is as definitely

marked by the north wall of the king's chamber, rightly located chronologically at i, as we saw the tenth day was at f by the south wall of the ante-chamber; for from the close of the ninth day to the close of the fourteenth is five days, which, multiplied by 33.6, gives 168 years, and from f to i is 168.96, so that, as there are five days from J to K, there are the same number from f to i.

This great year is not essentially affected by the theory advanced by some, that the beginning of the grand gallery marks the crucifixion, instead of our Lord's birth; for in that case D would be the passover instead of E, as I have here used, F still being the first Sabbath after the passover, and our reckoning from that onward would be the same.

When it was first presented to my mind that the year of solar cycles was symbolized by the Pyramid, the question that was then impressed upon me was: How much time had elapsed from A to D, and did it correspond with the rest of the Pyramid and the Bible by any consistent mode of interpretation. I did not then have any length for the entrance passage, but I soon had James Simpson's π length, as given in the *Banner of Israel*, vol. ii, page 90, which was 1089.6 from the outer surface of the casing-stone at O to the junction with the first ascending passage at P. Upon reading this I immediately added thereto the length of the first ascending passage, 1542, and the 1656, to the flood in our Bibles, and obtained the sum of 4287.6; and this without any attempt at fractional exactness. I had not then tried to ascertain the distance from A to D, but now, with these figures, I could test the probability, at least, of my theory. With the mean of Prof. Smyth's trials, $26^{\circ} 27'$ for the entrance passage, and $26^{\circ} 6'$ for the first ascending passage, we have intervening between A and D $127^{\circ} 27'$, and with 33.6 to a degree, we obtain 4282.32. This was sufficiently close to establish strong probability, for it wanted but ten minutes of a degree to be almost exact. But if D was the birth of Jesus, where was the second advent and the first fruits, which many were advocating were at hand? With D at $26^{\circ} 6'$ and H at 30° , I had $56^{\circ} 6'$. Now 56 times 33.6 are just 1881.6. Supposing that H marked the exact time (which I do not in this article,

but that it only points to the day), it would allow me six minutes of the ten wanted from A to D. Was it strange I should feel my theory quite well established? and should undertake to modify the angles somewhat? I think not; neither will any candid reader of the STANDARD. But this theory did not depend upon 1881.6 for support; and to-day I have stronger confirmations and am more grounded in my belief, for the day marked by H is not ended yet, nor can it be absolutely proved to be so until after 1893, and perhaps 1916, unless the angles of A and D can be absolutely determined within a minute or so. The stronger confirmations are the tenth and fifteenth days of the seventh month, for I had not then been presented with this additional light. But, although I think the theory is established on stronger and better grounds, yet those former confirmations are confirmations still.

But I have something to say in regard to the angles I have been using. I do not think they are quite so indefinite, but have used them thus in order to anticipate, as it were, any objections that might be raised in this way. I believe in a complete passage-chronology from the creation down, and that it corresponds exactly with the circular theory; that one corroborates the other, and that in this way we can decide, not absolutely, but with strong probability, very nearly the angle of the first ascending passage. I believe Mr. Thomas Wilson, in *Our Rest* for November, 1880, very conclusively showed the correct angle for A was $26^{\circ} 24'$; this being true, I think the angle of D can be shown to be less than 26° , about $25^{\circ} 56'$. Mr. Wilson has shown also, in *Our Rest* for January, 1880, the missing Pyramid-link at the beginning of the passage-chronology, from the creation to the flood. I unite this missing link with its successor in a little different and more definite way than I have ever seen it stated elsewhere. I do it in this way: When the step is reversed and enlarged, the joint in the low passage to the ante-chamber coincides with the first joint in the floor of the entrance passage above P. By ascertaining the hypotenuse of the step to said joint, and increasing its length by the same process as we increase the size of the step, and adding thereto the distance from the first joint above P to P, we have

the exact length of the entrance passage and the first and missing link in our passage-chronology; this gives about 2746.6. This number is the 1656 years to the flood, and the year of the flood, in our Bibles, making 1657; the 101.6 from the flood to the dispersion, of our Bibles, (Gen. xi. 10-16) and the measured distance from that dispersion to the exodus at P, 988, making 1089.6. Any one will at once recognize the 101.6 as the thickness of the casing-stone, or the distance from the beginning of the entrance passage to O, the outer surface, so that the flood is marked by this latter point. Then, if to 2746.6 we add 1542.6 (the correct number according to measuring rod, *Our Inheritance*, page 661) we obtain 4289.2; and with A at $26^{\circ} 24'$ and D at $25^{\circ} 56'$, we have $127^{\circ} 40'$ from A to D, which gives 4289.6. The very fact of so close a correspondence with the Bible and of these two theories of the Pyramid with each other, gives strong support to their correctness; for there seems to be no broken links in the Bible down to the time of Terah, but one continuous chain, link by link. However, the Bible numbers are given in whole numbers, and when the exact hypotenuse of the step to the joint is given, they may vary some.

But I have somewhat to say on the measured angles of the passages. About all that I have ever seen written concerning these have been attempts to give the true theoretical angle, and in this way to show they were all intended to be the same. I do not attempt to show there is not a theoretical angle, but I claim the measured angles were not intended to be the same. We know, according to Prof. Smyth's trials, the angle of the first ascending passage is less than the others, and yet I have never seen any reason suggested for this; but this circular theory gives us just the reason, and in a very decided manner. This theory also gives the reason why angles close to 26 degrees were chosen in preference to all others; why it was greater than the theoretical angle in the entrance passage, and less in the first ascending one. It was because of the position of these lines to each other and their position to the other lines in the diagram, and the relation of them all to the history of redemption.

Now, with some definiteness to our angles, we see that the tenth and fifteenth days of the seventh month are marked by measuring either through or over the step. 2060.8 from D brings us to J, the close of the ninth day; and, measured through the step, f makes 2064.33, and is, therefore, in the tenth day; but if measured over the step, f is at 2091.73; and then, if we add to 2060.8 the tenth day, 33.6, we have 2094.4 as the close of the tenth day, so that f would then be in it, though at its close. The fifteenth day is marked by i in the same way. For myself, at present, at least, I prefer to measure through the step to b, which makes the grand gallery's length about 1884.

Let us notice some other chronological points. The diagonal L points to 624.96, or the 19th day, in which the birth of Enoch took place, at 6:22 A. M. The flood transpired in the 50th or first jubilee day, and on a Sabbath. The apex marks the day in which the fine lines in the entrance passage occur. The death of Abraham, at the age of 175 years, probably took place in this day also, about fifteen years after the fine lines, he being born when his father was eighty years old. This is the most probable view, for Terah was seventy before either son mentioned was born, and it is more than probable that Haran was the oldest. That Terah was not too old is evident, because Jacob was ninety years old when Joseph was born. This being true of Abraham, we not only have the fine lines as the date of the building, but of Jacob's birth—the birth of Israel and his (their) altar to the Lord! No two events were more likely to be made to synchronize than these, and they are just what we would expect to be synchronous at this time.

The southern air channel, or the diagonal at M, at a rise of 45 degrees, would mark the accession of Josiah, the boy king of Judah, in 641 B. C., a notable event, as any one will see by turning to II Kings, xxii. and xxiii., and reading his biography. N is at 871.36 A. D., and Alfred the Great ascended the throne in this day in 871. The importance of this event needs no explanation, I trust, to any reader of the STANDARD. G marks the close of the sixth and the beginning of the seventh month. The change occurred in 1758.4 A. D., about the first of the

year 1759. This year was the turning point in favor of the English in the French and Indian wars for the supremacy in this country, and was the year in which the war closed in this country. Before the close of this day the independence of the United States was fully established. September 9-11 has been stated as a very important date, and has been thought to be marked in a very decided manner, if it was only searched out. I know not what will satisfy the mind in this case, but it seems to be pointed to in a peculiar way, although not by any direct line that I have yet been able to discover. It is in this way:—September 9-11, 1774, brings us to the close of that year when we consider that Jesus was born early in the autumn, perhaps in September; and the close of 1774 brings us within two and one-fourth minutes of a degree of a line drawn through the centre of this day. The appointment of Washington as commander-in-chief, on June 14th, 1775, occurred within less than a minute of the central line of this day, in the first half, and the Declaration of Independence very nearly the same distance from that line in the last half. There is a monthly feature to this year that is very significant, which I must notice before closing, the beginning of each month being marked by an event that was lasting in its result.

First month. The first day of this month was Adam's first day; by him was the earth to be peopled.

Second month. The second day of this month was the birth of Noah, from whom the earth was peopled after the flood.

Third month. The fourth day of this month witnessed the fine lines—the beginning of Israel and their “altar to the Lord in the midst of the land of Egypt.”

Fourth month. The beginning of Israel's monarchy and the cementing together of the tribes into a brotherhood, which was never completely broken, began in the very first of the sixth day or last of the fifth, very near the turning point between the two. This is, probably, near the close or southern end of the granite in the first ascending passage.

Fifth month. In the eighth day, the beginning of the Christian era.

Mark the day of the month of each event, up to this month,

a methodical increase in the time of beginning each event. I think this is to show the month is more than one thousand years long, for immediately this increase is omitted, and the event begins near the first of the month.

Sixth month. Alfred the Great began his reign in the fourth day, and became the sovereign of all England by recognition. His reign was marked with wonderful success and prosperity to the nation. But the importance of this event can not even be approximated here. In the tenth day occurred the Norman conquest, which needs no explanation to a believer in our Israelitish origin.

Seventh month. The beginning of what? A theocracy that is to culminate in what? We are living in the fourth day! What is at hand? Will the first fruits be offered soon? Will Jesus gather, out of his kingdom, all things that offend at the time of the harvest? and will the harvest of Israel be completed by the fifteenth?

Eighth month. Will the resurrection of the rest of the dead, the Gentiles, begin in the first of this month, at the close of the one thousand years' reign?

If I am not mistaken, the blind passage at the southern end of the subterranean or Gentile chamber leads us into the eighth month.

S. H. REEVE.

South Eliot, Me.

A CRITICISM OF MR. N. B. WOOD'S SYSTEM OF WEIGHTS AND MEASURES.

My sympathies go out to the Institute strongly and fervently. The metric system, priding itself on its scientific origin, on its beauty, symmetry and convenience, yet conceived in sin and born in iniquity, deformed, severe rather than symmetrical, rigid, inflexible, rather than convenient—this system is abhorrent to my Saxon soul. When I learned that there is in this country a society of scientific and influential men pledged to “preserve and protect Anglo-Saxon weights and measures,” my delight was unbounded. The perusal of the STANDARD gives me much pleasure. Like Mr. Skinner, I should like to be one of two hundred to contribute \$10 per year to its support until it becomes self-sustaining. *I think this scheme should be pressed.*

I have read the report of Mr. Wood, of the Committee on Weights and Measures. Supposing it to be subject to discussion and criticism, I must say that it is objectionable. He says: “We must have a decimal system or we will be compelled to adopt the metric system.” Why so? It is not apparent that any considerable number of persons are clamoring for decimal weights and measures except the avowed atheistic enemies of the English system, a few importing merchants on the seaboard, a few closet philosophers who seldom use weights and measures, but who would gladly undertake to prepare textbooks in conformity with the metric system, and a few book publishers who would like to do the printing, and thus increase the amount which their unconscionable extortion has already wrung from a helpless public. The *people* find no inconvenience and express no complaint. The wheat of all this region was weighed by the pound. No other unit was found necessary, and any farmer's boy ten years old can convert the sum total into bushels. “Sixteen ounces make one pound; 2000 pounds

equal one ton," is table enough for weight. It is sufficiently simple and comprehensive. If the pound be taken as the unit, it is difficult to see what good result would accrue from a decimal division of the pound. Farmers do not use ounces in weighing crops, and the grocer would certainly prefer a scale that permits the division of the unit into halves, fourths, eighths and sixteenths. For the uses of scientific men, special scales might be provided as at present. I have never heard a complaint as to our present weights and measures from common people.

The decimal system, notwithstanding the claim of its advocates, is not a "natural" but a highly artificial system. Nature does not use the decimal scale of variation. The distances and dimensions of the planets do not increase from Vulcan and Mercury outward in multiples of 10. In her laboratory, Nature does not use decimal proportions in combining her elements. Why then should we exhaust patience seeking for a cosmic—natural—unit only to engraft on it a system of variation that nature never uses? *The 10 is the fatal defect in the metric system.* This may seem to some a rash assertion, but I make it with a full knowledge of my responsibility. I am fully persuaded that all the inconvenience attending the use of that system springs from the very property on which its friends base its claims to popular favor. A cast-iron system with a *fixed unit* and an *inflexible ratio* must be productive of much inconvenience, and will not be accepted by the people. For scientific purposes, the scientific man, if willing to accept an arbitrary unit, can do no better than take the metric system; but the Institute is "preserving and protecting" weights and measures *for the people*. It must preserve first, protect afterward. Does Mr. Wood keep this in view? On looking at the tables, I can see but two words which I recognize as belonging to weights and measures—the pound and the inch. Depend upon it the people would demand the restoration of all of which these tables would rob them. Nor do I think they would accept such substitutes as podes, decapodes, hectopodes and kilopodes. These names have less of euphony, and are in no sense an improvement on metric nomenclature. These tables are metric

tables in disguise; and their adoption by the Institute would in my opinion be equivalent to an unconditional surrender. We lose the mile, the pint, the ounce, the acre—all the short, sharp, crisp Saxon words which are a part of our every-day speech, dear to us as a legacy from remote ancestors, and old perhaps as the Pyramid itself.

Again, Mr. Wood says: "A measure suitable for a board or a piece of cloth is suitable for the earth's surface." This principle carried into practice will ruin any system as it has ruined the French. How would it be possible to comprehend the diameter of a spider's web expressed in decimals of a mile? or the capacity of the Pacific in fluid ounces or minims? These illustrations are extreme, but they will answer my purpose. Astronomical distances are incomprehensible in terms of any unit, but they would be utterly bewildering expressed in inches or twelfths of an inch. The fact is we must have different units for different purposes. If we must accept the tables as presented, or adopt the metric system, I should not hesitate to embrace the latter, odious as it is. If our Saxon weights and measures are to be disguised, maimed and deformed, it will matter little whether the unit is retained or not. Time is happily beyond the power of men to tamper with. In this, the most irregular of our tables, the people experience no difficulty and express no complaint. The days and the years will continue to measure out their line as in the past, and the record of the ages will remain unchanged while the present order of the universe exists.

I have written candidly and kindly. It is well perhaps we cannot all see alike. In a multitude of counsel there is wisdom. My object is to give my voice against committing the Institute to any system of weights and measures different from those now in use, until the most careful thought, searching investigation and extensive experiment shall have proven it beyond dispute rigidly accurate, convenient, comprehensible by the people and acceptable to them. The work of the Institute will have to stand their verdict. Let us not forget for whom we are working.

Our present tables have thus far held their own against the

metric system. Nor would the French system have made such progress had it been generally recognized that there was a "battle of the standards." The metre has conquered the German and the Latin States, but we have the Anglo-Saxon world. We have England, Australia and Russia. We have *Egypt*,* too, with its Pyramid, and India with its teeming millions waiting for English civilization, English law and English measures. And we have America, whose English civilization will some day supplant the mongrel civilization of Spain and Portugal, and give uniformity of laws, language, manners, customs and measures to all the western world. The inch is mightier than the metre.

EDWIN R. GRAHAM.

THE PYRAMID BASE.

STRATHROY, ONTARIO, February 27, 1884.

CHARLES LATIMER, ESQ.:

My Dear Sir:—I have now arrived at a definite conception of the Great Pyramid, and have no fear of the work done by Petrie. On the contrary, we are very much indebted to him; his work has developed the *strong* and *weak* points, and has shown us where to work intelligently and with a certainty of obtaining positive results in perfect accordance with Prof. Smyth, and the formulæ of our Institute as given by Messrs. Dow and Skinner, the diagram of squares, circles and enclosed triangle of Mr. Latimer, and the astronomical theory I have recently put forth in the articles sent you, involving the two standard years of 365 and 365.2422 days. The work of Petrie has also furnished me with demonstrative evidence of a new order of my theory, that the passages are designed to represent sections of the zodiac, each inch representing one minute of arc in the zodiac or ecliptic. *But for the present, all our force should be spent on the base and external structure.* And, if an expedition is sent out, a special system of tests should be adopted in the triangulation to definitely settle leading points now known to the members of the Institute, and not known to Mr. Petrie, nor Prof. Piazzi Smyth, nor any one who has hitherto worked on the Pyramid. *It is impossible now for an expedition to do otherwise than succeed.*

I have drawn out or plotted a working plan of the Pyramid base and structure raised thereon, with a system of triangulations worked thereon, from data furnished by Mr. Petrie's book, and I am sure that an expedition sent out by the Institute will come home triumphant with honors. I am *also positive* that the measurements or lengths of base given by Petrie are not *actual* measurements, but theoretical lengths only; and that the Institute, by adopting actual measurements, will come home with results that must take precedence of anything furnished by Mr. Petrie, and be regarded as more reliable, safe and *actual*.

In his working plan of the base I have laid down a simple system of measurements,

* I am aware that the Egyptian Government has adopted the metric system, but England has her hand on Egypt. It will never relax its grasp.

capable of popular expression and publication, that leaves no doubt as to the working method adopted by the architect in laying out the base. But lest I should write out an essay, I will stop just here, and send what I have written for your own private use.

Let me know when you get the book, and let me also warn you of its cheap and miserable binding.

Yours truly,

S. BESWICK.

The theory set forth in this article is based on the fundamental conception that the architect first laid out on the ground a theoretically perfect square base, whose four sides were each equal to 9139.87125 British inches in length, in agreement with the formula first constructed by Mr. J. H. Dow, of Cleveland, and with reference to the use of the British inch, as first discovered by Mr. J. R. Skinner, of Cincinnati.

The architect placed this standard, theoretical base due N. E. S. W., and made its orientation perfect by actual survey and plotting upon the bare rock itself: laying out its sides and angles as upon a table. Having fixed upon and determined his standard stations and limits, he placed upon the same spot the present pyramid, giving its northern axis a westerly variation of 5' 12.66" from the true north of his standard base line, and giving its eastern axis a variation of 4' 23.6" from the true east of his standard base. His theoretical square base was, therefore, perfectly oriented and plotted out upon the bare rock as a guide for the builders of the Great Pyramid during its erection, with the variations above named, and for reasons set forth in this article.

In my former article I gave reasons for believing that the base of the Great Pyramid was constructed with special reference to a square base of 9139.8712 British inches to each side, but that the sockets had been prepared with special reference to a base whose north and east sides were each 9131.05 British inches in length, and whose south and west sides were each 9125 British inches in length. The first gives a year of 365.59 days; the second gives a year of 365.2422 days, equal to the equinoctial or true year, and the last gives the ancient sacred year of the Egyptians of 365 days. I now propose to illustrate this conception.

The Great Pyramid, as a geometrical figure, is evidently an acute quadratic octohedron, and consists fundamentally of a

rhombic form of the east zone, and an equal and similar rhombic form of the north zone, whilst the two south and west zones are equal and similar rhombic forms to each other, but are different in size from those opposite thereto on the north and east face. Let two rhombic prisms cross one another at the level of the equator, with their longer diagonals parallel with the vertical axis of the Great Pyramid; let the line of their direction be closer to the axis running east and west than to the axis north and south, and let the deviation from true north be 5' west of north, so as to produce angles of $51^{\circ} 51' 14.3''$ at the equator, and $76^{\circ} 17' 31.4''$ at the terminal apex; the result will be the production of just such a geometrical figure as I have described above.

Let me illustrate the result, and test it by the admirable measurements of Prof. Piazzì Smyth in 1865, and those made recently by W. M. Flinders Petrie in 1881. What would be the deviation, from true northwestward, required to alter the base side from 9139.8712 British inches, the side length of a perfect square base, to 9131.055 British inches, the representative of a true standard tropical and equinoctial year of 365.2422 days? $\frac{9139.8712}{2} : 45^{\circ} = 162,000'' :: \frac{17.632}{2} : 5' 12.66''$.

In other words, a difference of 8.82 British inches in the difference of length = $9139.8712 - 9131.0550 = 8.8162$ inches, would necessitate that everything at the Great Pyramid should trend *at its north end towards the west*, and the socket-sides of the base should deviate 5' 12.66'' from the true north. This is exactly what it does do—what actual measurements prove that it does do, and what theory requires and expects it to do. Prof. Smyth says:

“Everything trended at its north end, towards the west; the socket-sides of the base by 5 minutes.”—Our Inheritance, p. 349.

“The mean azimuth is 5' 16'' to the true north.”—‘Petrie's Pyramids,’ pp. 38-41.

Or, by reversing the case, allowing 5' 16'' for a mean deviation westward from the true north, the statement of Mr. Petrie would absolutely require that the side of a square base = 9139.8712 would have to be changed into a side length equal to

9131.05 British inches. On page 125 Mr. Petrie gives the same deviation with probable error = $5' 16'' \pm 10''$. Now, the actual deviation, which this change of 8.8212 British inches requires, to make the length express the exact length of the standard year of 365.2422 days, would be exactly $5' 12.66''$ of arc. This is a very close result with that which both Prof. Smyth and Petrie give, being only a difference = .009 of a British inch. And yet Mr. Petrie allows a marginal error of $\pm 10''$, our difference being only $3.34''$, or one-third of the error allowed.

This deviation of $5' 12.66''$ west of the true north was part of the plan and design of the architect, and the special purpose he had in view was this, that he might convert the side of a perfectly square base into one that should express, in British inches, the exact length of a standard equinoctial year of 365.2422 days, with the fractional part of a year included; and that whilst the north and east sides of the base give a year of this length, the south and west sides of the base give the ancient sacred Egyptian year of 365 days only, by which their calendar was regulated.

Let us now take the southern side of the base and consider it in relation to the sacred year of the Egyptians, consisting of 365 days only, with a base on the south and west sides of 9125 British inches. And in order to test our standard square base, being equal to a square with sides equal to 9139.8712 British inches, we will take Mr. Petrie's own value of the deviation from a true east on the south side, with a line of 9123.9 British inches from socket to socket. The deviation given by Mr. Petrie is $4' 53''$ from the east. What would be the effect upon a side length of the base by a deviation equal to $4' 53''$? It would diminish the length of the base by 16.813 British inches, and reduce it from 9139.8712—16.813 = 9123.058 inches. In other words, it would make the length what Mr. Petrie found it to be by actual measurement, with a difference of .842 of an inch and a probable error of $10''$. But if the true length of side be regarded as being 9125 inches (and this is very nearly Mr. Petrie's mean length, 9125.9 inches), the actual deviation ought to be

4' 23.6", instead of 4' 53". But some little should be allowed for warping.

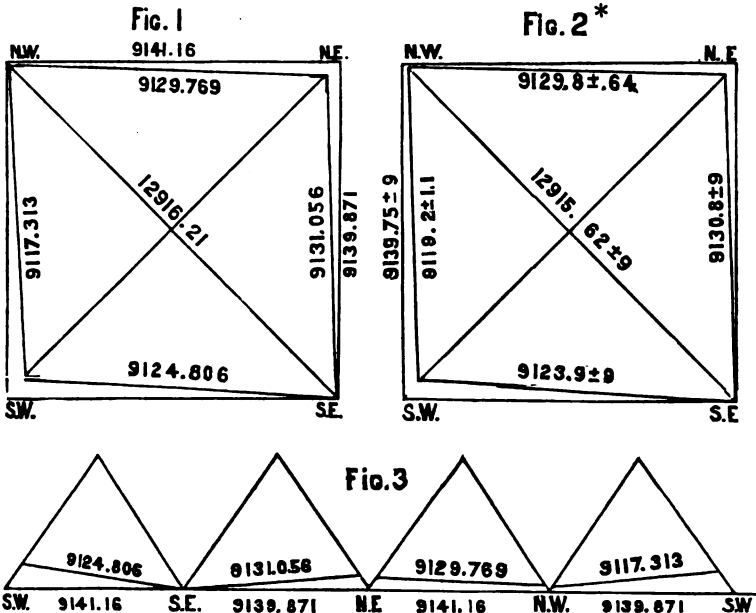
These remarkable coincidences in results prove clearly that the architect designed the Great Pyramid to represent a building *perfectly oriented*, with its horizontal axes due north and south, east and west, and took this ideal building as his foundation plan. He then determined that his future building should have a base so oriented as to represent the two standard years then in active operation, or became so afterwards—the sacred calendar year of 365 days and the standard actual year of 365.2422 days, whilst the north and east sides should represent and express, in actual British inches, the standard astronomical year of 365.2422 days. And to do this, the horizontal axis on the north side was made to deviate 5' 12.66" from the true north, westward, and thereby reduce the N. and E. sides to a length = 9139.055 inches. whilst the horizontal axis on the west deviated 4' 23.6" from the true east, thereby reducing the S. and W. sides to a length of 9125 inches.

But the principal effect of the warping is manifest in the western base side, where the shortest length is found. Mr. Petrie admits considerable warping in the S. W. angle of the masonry, and Prof. Piazzi Smyth gives a mean warping, trending or tilting of 6' 6" in the east and west walls, towards the south, in the king's chamber. But the base has a similar tilt or deviation in the southwest to the amount of 1' 43.3", making a total deviation of 6' 6", as seen in its effect upon the western base. For instance, Mr. Petrie makes the western base length to be 9119.2 inches from socket to socket. What would be the effect of giving the building a western base of this length, and how much variation would be required? The answer is easily given, and should be satisfactory. Assuming the standard square base to be 9139.8712 inches in length to each side, the deviation from a true east and west would be 6' 6.38". Such a deviation would require the western base to be exactly 9119.2 inches in length—the length given by Mr. Petrie in his published work. The true length should be 9125 inches, with a variation of 4' 23.6". Anything beyond these values is in excess of the original de-

sign, and a deviation from the true structure of this geometrical and architectural wonder of the ancient and modern world.

This discovery of the Pyramid's base, and its symbolic structure and design, will form a working hypothesis such as we have never had before, based on well established and duly authenticated measurements, and enable us to proceed with our researches to a more complete and advanced conception of the refined and mysterious knowledge possessed by the age which produced this ancient pile of masonry so full of mystery.

We may now take another step forward in our exposition of this remarkable discovery of the true form of the base. And in our critical examination of Mr. Petrie's very elaborate and excellent work, now under review, we will consider the reason why the architect has placed the sockets at different heights, and at different distances from the centre, the highest socket being nearest the centre. At the same time we now propose to submit our own discovery of the true theoretical form of the base to actual test and numerical proof.



* In Fig. 2 the decimal in each case after the plus or minus sign should be .65.

Why were the sockets placed at different heights? We will go round all the four sides of the base and test the measurements and heights of the sockets, thus putting our theoretical discovery and Mr. Petrie's measurements to the severest critical test. We will begin with the S. E. corner of the base.

(1.) EAST SIDE WITH ITS S. E. AND N. E. SOCKETS.

The architect has given the northern axis a westerly trend of $5' 12.525''$ from the true north. This would diminish the eastern base 8.8162 inches, and make it $9139.8712 - 8.8162 = 9131.0550$ inches in length. I have already proven this fact. But the architect would double this factor, and thus raise the height of the N. E. socket so that it would have a horizontal plane of only 9122.2388 inches, or $9139.8712 - 17.6324 = 9122.2388$ inches. Because the line forming the Pyramid's base must be a diagonal or mean length between the horizontal plane of the S. E. socket and the horizontal plane of the N. E. socket. And the exact height which this theory demands is 11.2456 inches of elevation. Mr. Petrie gives 11.4 inches for height and 9130.8 for length of base. Our estimate, although within the .9 of admitted error, is more theoretically correct than Mr. Petrie's estimate. The eastern base of the Great Pyramid is, therefore, a representative of the standard equinoctial or tropical year of 365.2422 days.

(2.) NORTH SIDE, WITH ITS N. E. AND N. W. SOCKETS.

The standard length of the northern base, like the eastern base, is also 9131.055 inches. But the architect made this the most horizontal of all the four sides, with but little difference in the height of the two sockets. So, taking 9131.055 as the length of the lower base, he raises the N. W. socket 7.1 inches, and thus gives it a truly horizontal plane, whose length is 9128.6666 inches. The diagonal or mean plane would be 9129.8608 inches, and this would be the builder's length. Mr. Petrie gives 9129.9 inches, without any closer fraction. Here, again, our theory is more accurate than Mr. Petrie's excellent measurements. The theoretical base in the architect's mind is

evidently 9131.055 inches, which represents the standard year of 365.2422 days.

(3.) WEST SIDE, WITH ITS N. W. AND S. W. SOCKETS.

This brings us to a consideration of the western face of the Pyramid. And here the standard theoretical value of the base changes from 9131.055 to 9125 inches. The latter is a representation of the ancient sacred year of 365 days. To make this change the S. W. socket is raised more than double the height of the N. W. socket. The latter, as we have seen, is 7.1 inches above the S. E. socket, and the former, or S. W. socket, is 16.813 inches high. At this height the horizontal plane would be 9113.6 inches in length, and the standard base plane 9125 inches. Between these two planes the architect has placed the diagonal mean line 9119.3 inches in length, joining the N. W. with the S. W. socket. Mr. Petrie gives the height 16.9 inches for height of socket, and 9119.2 for length of base, there being little or no difference between us. But the factor 9131.055 has now been changed to 9125 inches, as the representative of the ancient sacred year.

(4.) SOUTH SIDE, WITH ITS S. W. AND S. E. SOCKETS.

We now come to the south face of the Pyramid. We have shown, in a former article, that the core pyramid trends from the true east $4' 23.525''$, which diminishes the southern base side and makes it 9125 inches exactly. But the case is the same with the southern face as with the eastern. The socket has been placed at the S. W., so as to lift the S. W. end of the southern base to the height of a horizontal plane, equal in length to 9122.2388 inches, although the standard length is 9125 inches. The diagonal or mean line between these two planes is 9123.619 inches. Mr. Petrie gives $9123.9 \pm .9$ inches. He also gives 9122.5 for the value of the Royal Engineer's survey.

(5.) THE STANDARD SQUARE BASE NOT BUILT.

Something may now be said in relation to this standard theoretical base, which was evidently plotted on the spot whereon

the Pyramid was to be built and laid out as to its principal corners, and perfectly oriented, with stations fixed by which the builders could be guided in building the stone edifice, which had to be erected within the site of this standard theoretical base.

The south side was evidently run out to the full length and width of this standard theoretical base, to a station distant from the S. E. corner 9139.8712 inches, or double the distance of the difference between 9139.8712 and 9131.055, equal to $8.8162 \times 2 = 17.6324$ inches, or the difference between the actual length of the south base 9122.2388 and 9139.8712 inches. Mr. Petrie says, p. 206, "This is stated (Royal Engineer's survey) as 9140. Now, the outer edge of the socket-block at the S. W. is 17.5 inches *beyond the drawn line which defines the socket*, and is therefore about 9140 *from the S. E. corner.*" This is the outer theoretical standard base, which will be found to be perfectly oriented, being due N. S. E. W. The trend towards the west affects the southern end of the axis by exactly double the amount as stated above, to the extent of 17.6324 inches. Mr. Petrie makes it 17.5 roughly, and the length roughly at "about 9140 from the S. E. corner," instead of 9139.8712 inches.

So again, with the north end of the east base. The trend of $5' 12.525''$ diminishes the length of the east base, as we have seen, by 8.8162 inches, or from 9139.8712 to 9131.055 inches. The constant complaint of Mr. Petrie arises out of this fact. He says the foot of the casing, on all sides, was within the lines of the sockets. Exactly what our theory leads us to expect; for the outer lines form the standard theoretical square, whose sides are equal, and 9139.8712 inches in length, and perfectly oriented, its northern axis being exactly in the meridian without any variation.

In conclusion, we have been highly pleased with the tests to which we have submitted this work, and we cannot speak too highly of its real intrinsic merits, for its careful and extremely accurate measurements, and the evident effort which pervades the entire book to make the results attain a high order of excellence, and worthy of being regarded as one of the most complete—if not the most complete—expositions of the Pyramids

of Egypt that has ever been published. It ranks high as a standard work for numerical detail and data, and grouping of leading theories and facts, and will be extensively used as a work of reference, for its varied and elaborate measurements, and the reliability of its data, for some time to come.

S. BESWICK.

THE PILLAR OF WITNESS.

In these days there is heard among us an oft-repeated question: what *Scriptural evidence* can be produced to show that the Great Pyramid is the '*Pillar of Witness*,' as recorded in Isaiah, chapter xix, verses 19 and 20, which reads: "In that day shall there be an *altar to the Lord* in the midst of the land of Egypt, and a *pillar* at the border thereof, *to the Lord*, and it shall be *for a sign* and *for a witness* unto the LORD of hosts in the land of Egypt." An *altar* is a mount, or elevated place. A *pillar* is a pile, or heap—a monument to commemorate any remarkable transaction. That the Great Pyramid of Jeezeh is such an altar and pillar is too well attested for any one to deny; and that it stands *in the midst* of the land of Egypt, and also at the *border* thereof, was fully demonstrated by Mr. Henry Mitchell, chief hydrographer of the United States Survey. Now that we have found this great pillar standing in the specified place, the question is, *how* can it be *for a sign* and *for a witness* unto the LORD of hosts?

A *sign* is something by which *something else is shown*. And to be *a witness* unto any one is to furnish evidence or proof on his behalf.

It has been found (by very careful and thorough examination) to be built of rock of different kinds, arranged in such a way as to manifest great wisdom and design; and to have within the depths of its solid masonry, apartments with passages leading to them of exquisite workmanship, and in measures of such wonderful proportions and harmony of perfection as to manifest a knowledge superior to that possessed by man. Its speech,

though silent, is not unlike that of the stars in the arch of night. Surely it is a *sign* pointing to the handiwork of God. It is seen that some of its passages are descending, and some are ascending, and are in sections or divisions whose measures have such an agreement with the Bible history of man through past ages, even to the present time, as to prove it was designed by an infinite mind.

If in the Scriptures we read the number of years that elapsed from Adam to Noah, to the flood, to Abraham, to Isaac, to Jacob, the exodus, and to Christ, and find the same expressed in measures in the Great Pyramid and signally marked, we have reason to believe the same one who gave us his word in the Scriptures, has given us the corresponding evidence that we find in the Great Pyramid. If in this building we find the standards for weighing the earth and measuring the waters, the distance to the sun and the number of years occupied in the precession of the equinoxes, and very many other measures beyond the power of finite man to conceive, all in harmonious and perfect proportions, we must know it came from God. We read in his word by the prophet Isaiah, (xl, 12)—“He has measured the *waters* in his *hand*, and meted out heaven with the span, and comprehended the dust of the earth in a measure, and weighed the mountains in scales, and the hills in a balance.” In Proverbs we read, (xvi. 11) “A *just weight* and *balance* are the LORD’S. *All the weights of the bag are his work.*” And to Israel he said (Deut. xxv. 15), “Thou shalt have a perfect and just weight, a perfect and just measure shalt thou have; that thy days may be lengthened in the land which the LORD thy God giveth thee.” We have also the measures distinctly specified in the dimensions of the tabernacle and in the ark of the covenant, which we are told are the shadow of heavenly things. We read, Moses was admonished of God (when he was about to make the tabernacle), (Heb. viii.) “See, saith He, that thou make *all things* according to the pattern showed to thee in the mount.”

Now if we find these measures are the same as in the Pyramid, is it not most convincing proof that the LORD was the author of them both? Who shall rise up and deny it? or at-

tempt to substitute another system of weights and measures in its stead? Let us not be deceived by the fascinating sound of "decimal system," while those who advocate the system admit it is imperfect in its adopted unit for standard. The LORD speaks by the prophet Micah (Micah, vi. 11), "Shall I count them pure with the wicked balances, and with the bag of deceitful weights?" And in Proverbs it is said (xi. 1), "A false balance is abomination to the LORD; but a just weight is his delight." This great Pillar of Witness stands in Egypt, having in it but one piece of furniture, and that one piece a box, or coffer, of unsurpassed workmanship, cut out of one solid piece of enduring rock, and having the same dimensions as the ark of the covenant. Truly the Great Pyramid *is* a witness to the LORD of hosts. Well may we take up the song of Moses (Deut. xxxii. 3), Ascribe ye *greatness* unto our God. *He* is the ROCK, his work is perfect, for *all his ways* are judgment, a God of truth and without iniquity—*just* and *right* is he."

"*Every good gift and every perfect gift* is from above, and cometh down from the Father of lights, with whom is no variableness, neither shadow of turning." In the light of this word, let us consider how much money, labor and time have been expended by men of science for many years in efforts to obtain a perfect measure of the distance to the sun from the earth. Now, after all is done, only one man of the many has been able to come to a decision that is satisfactory, and that one agrees with that found at the Great Pyramid. We might ask: What relation have the *Pleiades* to our earth? Something surely—that God should talk with Job concerning them; and that by the mouth of the prophet Amos he should invite Israel in these words: "Thus saith the Lord, seek ye me and *ye shall live*. Seek *him* that maketh the *seven stars* and Orion, and turneth the shadow of death into the morning."

In the measures of the Pyramid is found the length of time in which the sun makes his circuit around *these same seven stars*, or the years of the precession of the equinoxes. The same great truth is uttered by the Psalmist: "The *heavens* declare the glory of God and the firmament sheweth his handiwork. Day *unto day* uttereth speech, and night *unto night* sheweth

knowledge. There is *no speech nor language* where THEIR voice is not heard. Their line (or procession) is gone out through all the earth, and *their* words to the end of the world. *In them* hath he set a tabernacle for the *Sun*, which is as a bridegroom coming out of his chamber, and rejoiceth as a strong man to run a race. His *going forth* is *from the end* of the *heaven*, and his *circuit* unto the ends of it." Who could have marked the measure of his circuit in the Pyramid but the LORD himself? Therefore it is a witness to the LORD. The one passage in the Pyramid called the 'grand gallery' on account of its great height, is seen to represent the Christian Dispensation. In Luke we have a wonderful announcement: "There were in the same country *shepherds* abiding in the fields, keeping watch over their flocks by night, and lo, the angel of the LORD came upon them, and the glory of the LORD shone round about them, and they were sore afraid; and the angel said unto them, '*Fear not*, for behold I bring you *good tidings* of *great joy*, which SHALL BE to *all people*; for unto YOU is born this day, in the city of David, a *Saviour*, which is *Christ the Lord*.'" This event is marked in the Pyramid by the commencement of the glorious, grand gallery.

His resurrection is also marked by a bursting forth of the rock at the measure of his years, and the length of this gallery measures the years to our present time—all recorded in this stone pillar so long ago. Is it not a witness to our God that *he* is God, "who hath declared the end from the beginning, and from *ancient times* the things not *yet done*?"

Other passages and chambers continue onward still further, whose interpretation is yet unknown, and which cannot yet be fully understood by man. When Moses desired to look into the future, God said to him (as one translator has it): "Thou shalt see what is behind me, but that which is before me shall not be seen." Hence, as these things were written so long ago in the Great Pyramid, it witnesses to the *Lord of hosts* that he is God.

In these days of infidelity, when men are saying the Bible was written by men without inspiration from God, that it is a *fable*, a drama, here rises up this pillar of witness, and says: I

was built and sealed up long before the Bible was written, but here is written the same things recorded in the Bible, witnessing to the LORD of hosts that *he is God*, who says: "Is there a God beside ME? I know not any;" and again, "Remember the former things of old, for *I am God*, and there is *none* else. *I am God*, and there is none like me, declaring the end from the beginning, and from ancient times the things that are not yet done, saying, my counsel *shall stand* and I will do *all my pleasure*." Ascribe ye greatness unto our God; *he is* the rock, his work is perfect.

ANGIE DAMON.

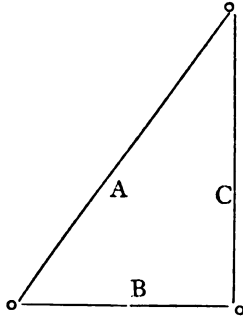
PYRAMID NOTES FROM THE ANTIPODES.

Your letter of the 10th of December at hand, also five numbers of the INTERNATIONAL STANDARD, viz: March to November inclusive, for which I hasten to thank you. I find much that is interesting and suggestive to me in this publication and shall be glad to become a subscriber to it, and if you like, an occasional contributor, although, perhaps, in respectful and healthy antagonism. Please continue to send me the work, and I will forward the sum of four dollars to cover the cost of the numbers already received and the subscription for the year 1884.

I shall look forward with interest to the critique upon my book by Mr. Jacob M. Clark, and to Lieut. Totten's paper upon the pentalpha.

Your offer to me to become a member is, I regret to say, beyond my power to accept. I differ with your Society in some things. I am not, for instance, prepared to nail my colors to any standard, such as that the π ratio is the leading principle of the principal pyramid of the Gizeh group.

You are wrong in your calculation of the angle of the Pyramid Cheops, according to the pentalpha; it is not $51^{\circ} 49'$, but $51^{\circ} 49' 49''$, it is thus:



Let A = apothem.

B = base half of

C = altitude.

$$(A + B) : A :: A : B$$

i. e. A and B are in mean and extreme ratio; and

$$A : C :: C : B$$

i. e. The altitude is a mean proportional between apothem and half base.

Arithmetically, $A = 2$

$$B = \sqrt{5-1}$$

$$C = \sqrt{A \times (A+B)},$$

$$\text{also } A + B = \sqrt{5+1}$$

whence may be got the figures representing the lines.

$$A = 618034$$

$$B = 381966$$

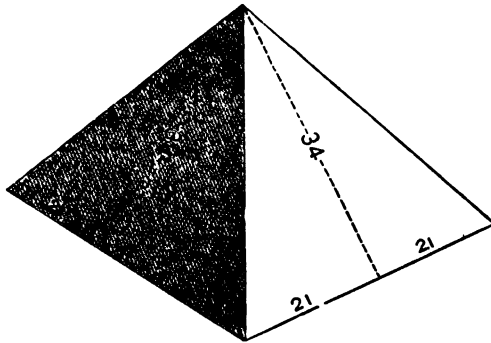
$$C = 485868$$

whence \angle at base = $51^\circ 49' 49''$

A pyramid on these proportions with the base of 761.65 feet assumed by Piazzi Smyth, would be 484.41 feet high, or exactly six inches lower than the height assumed for the Pyramid by Piazzi Smyth, viz: 484.91 feet.

But I never claimed that the above was the building ratio of the Pyramid Cheops. Refer to my Pyramid 'Solution,' page 21, figure 6. There you find the following diagram given as the building ratio, viz: apothem 34 to half base 21. Here the angle is $51^\circ 51' 20''$ (pretty close to your π , being a result of 3.1414 for twice the base divided by the alti-

tude) and if you make the base of the above pyramid 761.65 feet, its height will be exactly 484.91 feet, agreeing ex-

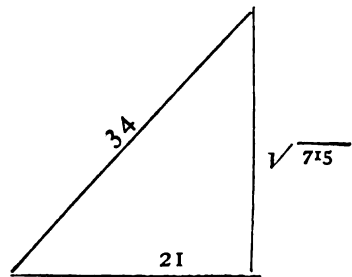


actly to the height and base accorded to Cheops by Piazza Smyth as a π pyramid.

Now, since the ratio of this Pyramid as built, is proved undoubtedly by Vyse's casing stone, and other proofs (all of which you claim for π), to be 34 apothem to 21 half base, I fail to see why it should be called a π pyramid; or an approximate to a pentalpha pyramid.

My calculations for my last quoted results, are as follows:

$$\begin{aligned} \text{Apothem} &= 34 \\ \text{Half base} &= 21 \\ \therefore \text{Altitude} &= \sqrt{715} \end{aligned}$$



$$\therefore (21 \times 2) : \sqrt{715} :: 761.65 : 484.91$$

However, since the ratio of 34 apothem to 21 half base is within $3''$ + of the angle that your Society claims for the Pyra-

mid, I, as a practical builder, have no cause to complain, we agree quite near enough in the shape of this pyramid for you to graciously acknowledge the truth of the builder's ratio which I have ascribed to it.

Mr. Petrie, I see, supports my ratios too, as well as Mr. Smyth by his figures; for, in his book on the 'Pyramids and Temples of Gizeh,' he gives the following angles for the 1st, 2d, and 3d Pyramids respectively, viz:

1st, $51^{\circ} 52' 0''$
 2d, $53^{\circ} 10' 0''$
 3d, $51^{\circ} 10' 0''$

My ratios of apothem to half base for three pyramids being (see 'Solution,' p. 23)

1st, 34 to 21
 2d, 33 to 20
 3d, 32 to 20

My angles are, therefore,

$51^{\circ} 51' 20''$
 $52^{\circ} 41' 41''$
 $51^{\circ} 19' 4''$

Looking at the utter impossibility of getting at the angles on the ground now the casings are destroyed, I consider Mr. Petrie's measures a near approximation to my angles theoretically obtained.

I have refrained in my book from entering upon the consideration of the inner chambers of the Pyramid, but I am glad to find that your Society is proving the truth of my prophecy at page 80 of my 'Solution,' "That the very accurately and beautifully worked stones in the walls of the king's chamber of Cheops, may be found *to indicate* the ratios of the rectangles formed by the bases and perpendiculars of the triangulations used by the old surveyors—that on these walls may be found, in fact, corroboration of the theory that I have set forth."

The interesting paper of Mr. W. Searles, in the March num-

ber of the STANDARD, called "The proportions of the king's chamber," goes a long way to prove the above.

The king's chamber in the Pyramid Cheops is a solid, practical demonstration of the formula for constructing primary (or whole sided) triangles, generally described by me in my 'Solution' pages 65 to 73, and of which the simple arithmetical formula is given on page 72.

In this chamber let

$$\begin{aligned} A &= \text{--- width} = 2 \\ B &= \text{--- end diagonal} = 3 \\ C &= \text{--- length ---} = 4 \\ D &= \text{--- solid diagonal} = 5 \\ E &= \text{--- height} = \sqrt{5} \\ F &= \text{--- floor diagonal} = \sqrt{20} \\ G &= \text{--- wall diagonal} = \sqrt{21} \end{aligned}$$

The original primary 3, 4, 5, is here found in B C D and its satellite 2 — 1 in C and A.

The 20, 21, 29 triangle is indicated by F and G. Now the satellite 5, 2, of the 20, 21, 29 triangle, is found represented by D and A, for the solid diagonal and end width of the paralleloipedon answer in the solid, to the sine and versed sine in the flat, of the primary formed by sine, cosine and radius.

Therefore, by formula p. 72, of my 'Solution,'

$$\begin{aligned} D^2 + A^2 &= 5^2 + 2^2 = 29 \\ D^2 - A^2 &= 5^2 - 2^2 = 21 \\ D \times 2A &= 5 \times 2 \times 2 = 20 \end{aligned}$$

The beauty of this solid demonstration is not more than the flat working, but it is more striking; either way the corresponding triangles are equally well indicated.

Chambers of the same class may be constructed from any primary or whole-sided triangle, and beautiful sets produced for insertion in sets of tables and showing the connection of these wonderful trigonometrical aids. Thus, taking the same letters that I have placed opposite the dimensions of the king's cham-

NOTE.—No doubt by comparing end diagonal, solid diagonal, and length of other chambers in the pyramids, you may find other primary triangles.

ber, we can evolve, by prosecuting the theory triangles, and chambers, as follows:

	King's Chamber.	Another—The Theoretical.	Another—The Theoretical.
A	2	9	400
B	3	21	760
C	4	20	522
D	5	29	922
E	$\sqrt{5}$	$\sqrt{319}$	$\sqrt{112484}$
F	$\sqrt{20}$	$\sqrt{522}$	$\sqrt{737600}$
G	$\sqrt{21}$	$\sqrt{760}$	$\sqrt{690084}$

Thus, as the 3, 4, 5, *indicates* the 21, 20, 29, so does the 21, 20, 29, *indicate* the 760, 522, 922, and that in its turn *indicates* the 690084, 737600, 1010084 whole sided triangle.

In the same way, suppose the pyramid builders had wished to display the 3, 4, 5 triangle in a chamber of another form, they would have done it as follows, viz :

$$\left. \begin{array}{l}
 A = 1 \\
 B = 4 \\
 C = 3 \\
 D = 5 \\
 E = \sqrt{15} \\
 F = \sqrt{10} \\
 G = \sqrt{24}
 \end{array} \right\} \text{ indicating the 10, 24, 26 triangle.}$$

In this you will observe that C and A = 3, 1 = the satellite to the 3, 4, 5 triangle, with 3 as a base, as in the king's chamber. 4, 2 (2 - 1) was the satellite to the 3, 4, 5 triangle, with 4 for a base; and from these a series can be evolved, viz : the 10, 24, 26 triangle, and the 52, 675, 677, &c., &c.

The above is a very pretty geometry, and in pursuing it all sorts of beautiful combinations arise, throwing light on the foundation of primary triangulation, or right-angled, whole-sided trigonometry.

You ought to be well satisfied, after Mr. Searles' paper on the proportions of the king's chamber, and after pursuing it further, that my hypothesis is correct, that the 3, 4, 5, and the 20, 21, 29 triangle were the main angles of the Gizeh Pyramid builders, the more especially as in the inclination of the galler-

ies may be found the angles of various primary satellites = $\frac{1}{2}$ < of primary.

I think you are very "rough" on Mr. Petrie—I never read a less *prejudiced* book—the prejudices appear to me to lie with *nous autres*, whom he calls the "theorists," and very properly too, we are pure theorists, but I hope that some of our theories are correct.

I note your remarks about the need for exposing the secret love of the Freemasons—perhaps it is time, perhaps not. I have given a few broad hints in my book, but, the fact is, that there are no masons who are not deeply versed in geometry who have any idea to what glorious mysteries their ceremonials point. I am a mason of the 30th degree and have studied the craft deeply, in so far as it is connected with geometry and numbers.

I may admit, without in any way committing a breach of masonic confidence, that our mysteries *distinctly point* to the preservation of the pentalpha as *the most sacred of symbols*, and to the fact that, in the erection of all great and superb edifices it was the custom to take particular care to deposit the working plans every night securely in a place of safety; whence you may be perfectly justified in the assumption, that the working plans of the Great Pyramid itself may yet be found upon intelligent search, securely deposited within the Pyramid.

R. BALLARD.

MATHEMATICAL ACCURACY.

In some of the communications sent for publication in this Magazine, distinction between pure and mixed mathematics does not appear to be carefully recognized. Statements are made about the mathematical accuracy of measures and lines, where the term instrumental accuracy should be used. Exactness is affirmed where only approximation is possible. Pure mathematics, or the science of numbers, the formulæ and processes of algebra, the axioms and demonstrations of geometry, deal with mere ideas or conceptions of the mind. A line in pure mathematics has no existence. It is the mind's conception of length or distance without breadth or thickness; it is only a thought, an idea, and, in fact, unmakeable. The circumference of a circle is the mind's conception of a line equally distant from one point, in one place. A circle is unmakeable; it can be found neither in art nor in nature. Approximations can be made to a line or a circle; but the finest line in photography has breadth; it does not answer the mind's conception of pure lines.

Now, in the discussion of pyramid planes and lines, the most that can be said of them is that they are approximations to the ideal—very close, no doubt—perhaps with an error of only a hundredth of an inch, but the error is there.

Mixed mathematics is an application of mathematical conceptions to physical objects. It determines what the physical forms and proportions would be if they coincided with the mathematical conceptions. But, in the very highest art, the coincidences are nothing but approximations. The coincidences may be so close and so numerous, and so related to one another, that they will really exhibit the intention of the construction. In common speech, an ellipse, is quite different from a circle; yet the ellipse approximates the circle as its two diameters approach equality till the difference is not instrumentally

measurable. A circle circumscribed about an ellipse has but two points coinciding with the ellipse. The moment a third point of coincidence occurs, the ellipse becomes coincident with the entire circumference of the circle. Hence where the number of instrumental coincidences increases between the different lines of the same structure, we can read the intention of the architect with as much certainty as we do the purpose of an author in the relationship we discover between the several chapters of his book. Beyond all doubt, multitudes of instrumental coincidences exist in the Pyramid. Their value rests wholly upon the question, were these coincidences designed or undesigned. Do they mean anything? They may be only the result of geometrical relations. If so, they exhibit the architect's knowledge of geometry and skill in workmanship. But if the coincidences go beyond geometry and touch the physical world and astronomical facts and relations and historical records, there is an *a priori* probability that such coincidences and series of coincidences were designed; and consequently the proof that they were not designed is a burden that rests upon him who says they were not designed.

There is almost no end of the curious and interesting results of geometrical relations discoverable in the Pyramid within the limits of instrumental error. It is a geometrical structure. It is a grave problem to undertake to interpret its geometry and apply it to the solution of the problems—the physical world. Some men rush into it with amazing boldness. The very joints of its masonry ought to be enough to warn thoughtful men that this is no ordinary building. They would not enter the great cathedrals in that fashion, yet there is no workmanship in the cathedrals equal to that of the Pyramid. But the cathedrals are rich in historical associations, and therefore are worthy of reverence. And shall we have little respect for the Pyramid because we are ignorant of its living associations? It is a witness of long standing. The perfection of its workmanship, if nothing else, should stimulate us to investigate its meaning. Whoever may happen to pick up a fragment of the truth, very unwisely claims to have found the whole truth and nothing but the truth. Many authors have written history, but how much is chaff?

Criticism will yet sift Pyramid theories even as doubt sifts written history, to bring to light truth and truth only. It would be well if all Pyramid students, who believe or even think it possible that the Egyptian monument is a product divine or semi-divine, would be less bold in their assumptions, more content to be pupils, and less ambitious to be professors.

H. G. WOOD.

“PROVE ALL THINGS.”

Many Pyramid students have been led into error by accepting on trust the assertion, too often found in our publications, that the arris lines of the Great Pyramid (its sloping edges from corners of its square base to its apex) approach the axis of the Pyramid ten feet for every nine feet of rise. This ratio is only approximate, and the discrepancy between this and the height : perimeter :: radius : circumference proportion of the Pyramid is so great that the combination of both in a single geometrical figure was surely not the intention of the architect. For if the two propositions harmonize, and are embodied in the Pyramid, we shall then have the general proposition : The perimeter of the base of a π pyramid equals the circumference of a circle whose radius is 9-10 of the half diagonal of the base. But this proposition cannot be true, for if it were correct—Let s = side of square base, then $\sqrt{2(\frac{s}{2})^2} \times 9-10 \times \pi = 2s$. Reducing this gives $\pi = \frac{20\sqrt{2}}{9} = 3.142 +$, which is inadmissible. Hence let us write in large letters so that every one may take notice :

THE SO-CALLED 10 TO 9 SLOPE OF THE CORNERS OF THE GREAT PYRAMID IS A FALSITY.

J. H. Dow.

MANUFACTURE AND PROPORTIONING OF
WEIGHTS AND MEASURES.

TO ALL WHOM IT MAY CONCERN :

Be it known that I, Charles A. L. Totten, of the Army of the United States, have discovered and invented a new and useful improvement in the mode of making and proportioning Weights and Measures ; and I do hereby declare the following to be a full, clear, and exact description of the same :

This invention is particularly concerned in the discovery of the proper aliquot parts by means of which a system of weights and measures, similar to those known as "troy," "apothecary," "avoirdupois," "wine-measure," "dry measure," "imperial," and, in fact, all Anglo-Saxon weights and measures, may be improved, perfected, and mutually connected with each other, for the purpose of better reduction and facility in passing from one system to another. The adoption of my system will change all the values now involved and known as "grains," "drams," "ounces," "pounds," "gills," "pints," "quarts," &c., (more or less,) in such a way as to render them new amounts. The changes, however, are of very small quantities from the practical standpoint of every day life, and while not calculated to involve inconvenience, if ever adopted, are still such as to be radical from a scientific standpoint, in that they look toward unifying, under certain new and essential formulæ, things which now are not so.

I will now describe my discovery, after which I will be able to point out more clearly how much and how little I differ from the present systems.

The basis of my system of weights and measures is a cubic inch of material, whose density shall be 5.7 times that of pure water at mean earth temperature and pressure. For the purposes of correlating the various systems now in use, I have discovered that such a quantity of material—(1 inch)³ at 5.7 pure water at earth's mean temperature and barometric pressure should be subdivided into exactly 1,536 elements, which I shall denominate "grains." These elements correspond very closely with what have hitherto been termed "grains" in Anglo-Saxon and other weights and measures ; but they differ from them essentially, in that they are a shade less, in the ratio of about, (in cubic inches of pure water, &c.): my grains equal .0037109375. (exactly); present grains equal .00395735 $\frac{1}{2}$. I furthermore propose to subdivide my "unit cube" into certain other ultimates of still less dimensions, such that there shall be exactly 2,000 thereof contained therein, and which have no counterpart in the present Anglo-Saxon measures of weight. I shall call these "ultimates," because I can conceive of no smaller denomination for purposes of weights ever being necessary as a thing of special "name." I will again emphasize the fact that in my unit cube there shall be (at mean temperature, taken for the present at 68° Fahrenheit, and pressure taken at 30" barometer) exactly 1,536 grains and 2,000 ultimates.

I will now define and fix absolutely what I mean by a "grain" and an "ultimate."

My ultimate shall exactly equal .00285 cubic inch of pure water at mean temperature (68° Fahrenheit) and 30" barometer, or be 1-2000 of such a cube as I have above described.

My grain shall equal exactly 125-96 of an ultimate, equal .0037109375 (exact) cubic inch of pure water at mean earth temperature and pressure.

I now declare that what I shall employ and denominate as the "unit ounce weight" shall consist of 480 of my grains or of 625 of my ultimates, or, in other words, shall equal

in weight exactly 1.78125 cubic inch of pure water at mean temperature and pressure. When I say "exactly," I mean it literally. There are, for instance, no more figures after the 5 in the number (1.78125) just employed. The foregoing values being fixed and constant, I intend to rectify Anglo-Saxon weight and capacity measures thereby. For instance, my avoirdupois pound is to consist of 16 of the above unit ounces, my troy and apothecary pounds of 12 such ounces; and I intend to introduce one other system of weights, which I shall designate as "standard weight," in which the pound shall be 10 such ounces. These various weight-measures, as rectified by the above constants, will therefore stand as follows, in which it will be noticed that while I preserve, as I of course intended in rectifying the system, the terms now in use, I have necessarily altered all their values, and added the ultimate as a still lower subdivision. Since I claim this as an entirely new system, it must be constantly borne in mind that as my ultimate, grain and ounce are different by a shade from the present grain and ounce, my whole scheme of weights and the capacity measures, hereinafter to be shown as resulting from them, must correspondingly vary, and must therefore be new, whatever may be its essential value for future use among men.

Now, my tables are as follows :

TROY WEIGHT.

24 grains—1 pennyweight= $31\frac{1}{4}$ ultimates.
 20 dwt.—1 ounce=480 grains=625 ults.
 12 oz.—1 pound=240 dwt.=5,760 grs.=7,500 ults.

Upon its surface the above table, save in the use of the additional ultimates, does not appear to differ from troy weight as given in any book of tables. This is because I preserve all the terms and the form of the old system. This is one of the chief merits in the value of my discovery, that, while by my system the weights now in use become absolutely perfected, no confusion can result in their adoption.

APOTHECARY WEIGHT.

20 grains—1 scruple=26 1-24 ults.
 3 scruples—1 dram=60 grs.= $78\frac{1}{4}$ ults.
 8 drams—1 ounce=24 scruples=480 grs.=625 ults.
 12 ounces—1 pound=96 drs.=288 scru.=5,760 grs.=7,500 ults.

Similar remarks are in order relative to the above table.

AVOIRDUPOIS WEIGHT.

30 grains—1 dram=39 1-16 ults.
 16 drams—1 ounce=480 grains=625 ults.
 16 ounces—1 pound=256 drs.=7,680 grs.=10,000 ults.
 28 pounds—1 quarter=448 oz.=7,168 drs.=215,040 grs.=280,000 ults.
 4 quarters—1 cwt.=112 lbs.=1,792 oz.=28,672 drs.=860,160 grs.=1,120,000 ults.
 20 cwt.—1 ton=80 qrs.=2,240 lbs.=35,840 oz.=573,440 drs.=17,203,200 grs.=22,400,000 ults.

In the avoirdupois table the present form and skeleton are preserved, save that the effect of my discovery is to rectify the form in one particular—namely, 30 of my grains equal 1 dram, while in the present statute tables 27.34375 of the old Anglo-Saxon grains go to form the dram. My system thus clears the most important or commercial weight of its awkward fractional commencement, besides making its ounce, grain, and ultimate of the constant or unit value of all the other tables.

STANDARD WEIGHT.

10 standard grains—1 standard scruple=13 1-48 ults.
 4 standard scruples—1 standard dram=40 grs.= $52\frac{1}{4}$ ults.
 12 standard drams—1 standard ounce=48 scr.=480 grs.=625 ults.

10 standard ounces—1 standard pound=120 drs.=480 scr.=4,800 grs.=6,250 ults.
 (4 pounds—1 quart. wt.)=480 drs.
 (2½ qt. wt.—1 stone)=10 lbs.=&c.
 10 standard pounds—1 standard stone=100 oz.=1,200 drs.
 (4 stone—1 sack wt.)=40 lbs.=400 oz.=4,800 drs.
 (2½ sk. wt.—1 quintal)=100 lbs.=&c.
 10 standard stone—1 standard quintal=100 lbs.=1,000 oz.=12,000 drs.
 (4 quint.—1 wey)=40 st.=400 lbs.=4,000 oz.=48,000 drs.
 (2½ weys—1 thous. wt.)=100 stone=&c.
 10 standard quint.—1 standard thous. wt.=100 stone=1,000 lbs.=10,000 oz.=120,000
 drams.
 (4 thous. wts.—1 ton)=40 quint.=400 stone=4,000 lbs.=40,000 oz.=&c.
 (2½ tons—1 bin)=10 thous. wt.=100 quint.=&c.
 10 standard thous. wts.—1 standard bin=100 quint.=1,000 stone=10,000 lbs.=100,000
 ozs.=&c.
 4 bins—1 standard=10 tons=40 thous. wts.=100 weys=&c.

In the above table, which is a new one, but in which, for facility of introduction, old and well known Anglo-Saxon terms are employed, the most noticeable feature is its decimal system. Commencing at the unit ounce, it may be read decimally as follows :

10 ounces	make one pound.
10 pounds	“ “ stone.
10 stone	“ “ quintal.
10 quintals	“ “ thousand weight.
10 thous wts.	“ “ bin.
4 bins	“ “ standard.

But it is doubly decimal, since there is an alternate system running through it, as follows :

4 pounds	make one quart. weight.
10 quart. wts.	“ “ sack weight.
10 sack wts.	“ “ wey.
10 weys	“ “ ton.
10 tons	“ “ standard.

Moreover, a careful study of the table will show the facility with which any and all of its various terms may be halved, quartered, and multifariously subdivided into common fractional parts. Thus, 1 pound equals ¼ of a quart ; 5 ounces equal ¼ a pound ; ¼ of a sack equals 1 stone, &c. The completeness with which this common fractional subdivision, so necessary in the daily use even of a decimal system, may be effected, will be best understood from the following : Since there are 4,800 grains in a standard pound, and since $4,800=2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 3 \times 1$, it follows that the pound may be divided into halves, thirds, fourths, fifths, sixths, eighths, tenths, twelfths, fifteenths, sixteenths, twentieths, twenty-fourths, twenty-fifths, thirtieths, thirty-seconds, fortieths, forty-eighths, fiftieths, sixtieths, sixty-fourths, seventy-fifths, eightieths, ninety-sixths, one hundredths, one hundred and twentieths, one hundred and fortieths, &c., and hence that every term in the table may likewise be so subdivided without fractional remainders, &c.; hence, if a decimal table of weights and measures be actually necessary at the present state of science and commerce, we have one in the system now discovered whose introduction will involve no change of terms in Anglo-Saxondom, whose unit (the ounce) is that of troy, apothecary and avoirdupois weights, and one, too, in which the decimal system is not only double, but which offers extraordinary facilities for the still more necessary employment of common fractions, &c.

From the foregoing tables the following facts result :

1. Since in my system the ultimate and grain are each perfect aliquots of a cubic inch

of my standard material, (5.7 water)—to wit, 1-2000 and 1-1536, respectively—and since all of my subdivisions throughout the tables, as rectified, contain whole numbers of grains, it necessarily follows that there are no subdivisions in the entire series of the tables which are not likewise exact aliquots or multiples of such a cubic inch—*i. e.*, there are none of whose cubic contents in exact mathematical terms we may not say it shall and does contain so or so many cubic inches. Take, for example, any one, as a dram apothecary; then by my system it must contain 60-1536 of such a cubic inch as I have defined, and any irregular number of drams—as, for instance, 7½ will contain (7½) 60-1536=23-3. 60-1536=460-1536 parts of such a cubic inch.

II. For similar reasons every subdivision in my series of tables is exactly expressible in terms of a cubic inch of pure water at mean temperature and pressure. For as an ultimate equals .00285 (exact) cubic inch of water, and as a grain equals $\frac{125}{96}$ ultimates, it follows that any chosen subdivision, as a dram apothecary, will contain or balance .00285 \times $\frac{125}{96} \times 60$ exact parts of a cubic inch of water at mean temperature and pressure. Performing the above-indicated multiplications, the fact results that one dram apothecary (by my system) must contain $a = \frac{534375}{2400000}$ of a cubic inch of water, &c.; and 7½ such drams, equal $\frac{23}{3}$ drams, will contain $\frac{23}{3} a = \frac{11290625}{7200000}$ of a cubic inch of water at mean temperature and pressure. Now, it is true that the above quantities are large fractions; but they are finite and exact. This is their advantage for scientific purposes, and I declare that no possible question of the above nature can be asked of my system which the tables will not answer without error in a finite form, while I know that the present Anglo-Saxon system—*i. e.*, as per statute to-day—and that the metric system of France, or any other system now known, cannot and do not dream of attempting such a gigantic problem.

III. As a remarkable sequence of the above facts, the following one results, to wit: That since water is taken as the unity material of all specific gravity, and since a cubic inch of it is expressible by my system in a determinate number of aliquot parts (*i. e.*, 5.7 cubic inches water at mean temperature and pressure equal 1,536 grains weight), and since any and all of the Anglo-Saxon subdivisions thence come out without error in parts of such a cubic inch, hence, and to that degree of accuracy with which science can, has, or shall determine the specific gravity of any substance whatever in terms of water, then to that same degree of accuracy, no more and no less, will my tables and moduli say what is and what must be the value of a cubic inch of such material in grains and ultimates. Thus, let x equal specific gravity of any substance whatever; then, a cubic inch of 5.7 material weighing 1,536 grains, it follows that $(1,536 \div 5.7) \times x$ equals the number of grains in a cubic inch of the new substance x —*i. e.*, there are $\left(\frac{15360}{57}\right)x$ grains in such a cubic inch. Take iron, for instance, with a specific gravity of 7.125; then in a cubic inch thereof there are $\left(\frac{15360}{57}\right) 7.125$ grains. Expressed decimally the number $\left(\frac{15360}{57}\right)$ is a repetend, and equals $\overline{269.47368421052631578947368} + \&c.$; hence though finite in either form it is of course more simple in the common form. Similar remarks are in order relative to the value of cubic inches of all materials in terms of the ultimate. Thus $\left(\frac{20000}{57}\right)x$ equals number of ultimates in a cubic inch of a material whose specific gravity is x at mean temperature and pressure. The common fraction $\left(\frac{20000}{57}\right)$ is also, when expressed decimally, a repetend, to wit: equals $\overline{350.877192982456140350} + \&c.$ Such possibilities as are here enjoyed are not possessed by any other system of weights and measures upon the earth.

Having now established my unit cube [$(1'')^3$ of 5.7 density of water at Fahrenheit 68°, barometer 30",] and defined its aliquot parts in ultimates and grains, and also what my

unit ounce shall be, it is manifest that my unit cube will contain $\frac{1536}{480}$ ounces, or 3 1-5 ounces. I am now ready to explain my standard cube for heavy weights. It will be noticed that in my system of weights the one which I denominate "standard weight" ends with a term called a "standard." It is from this fact that I derive its name. Now, since this weight contains 400,000 ounces, each of which contains 480 grains, it follows that it will contain 192,000,000 grains; and since each of my unit cubes contain 1,536 grains, this standard will contain $192,000,000 \div 1,536 = 125,000$ such unit cubes, each of which is of 5.7 density of water at mean temperature and pressure; but the number 125,000 is itself a perfect cube—i. e., it equals $50 \times 50 \times 50$; hence the grand standard weight with which my system of rectified Anglo-Saxon weights culminates is a cube of 50 inches on an edge of that material whose specific gravity or density shall be 5.7 times water at mean temperature and pressure. By means of this cube I intend to extend my system upward, so as to comprehend the most extravagant demands that can be made upon it by a world at peace and engaged in universal intercourse and international commerce. A scheme for such extended use is given below, and since a standard equals ten tons, an average car-load, we have—

10 tons	$\left\{ \begin{array}{l} 2\frac{1}{2} \text{ tons} = 1 \text{ bin} \\ 4 \text{ bins} = 1 \text{ standard} \end{array} \right.$	$\left. \begin{array}{l} \\ \end{array} \right\} = 1 \text{ standard or car-load.}$
10 car-loads	$\left\{ \begin{array}{l} 2\frac{1}{2} \text{ car-loads} = 1 \text{ lighter} \\ 4 \text{ lighters} = 1 \text{ barge} \end{array} \right.$	$\left. \begin{array}{l} \\ \end{array} \right\} = 1 \text{ barge.}$
10 barges	$\left\{ \begin{array}{l} 2\frac{1}{2} \text{ barges} = 1 \text{ ship-load} \\ 4 \text{ ship-loads} = 1 \text{ elevator} \end{array} \right.$	$\left. \begin{array}{l} \\ \end{array} \right\} = 1 \text{ elevator.}$
10 elevators	$\left\{ \begin{array}{l} 2\frac{1}{2} \text{ elevators} = 1 \text{ wharf} \\ 4 \text{ wharves} = 1 \text{ district} \end{array} \right.$	$\left. \begin{array}{l} \\ \end{array} \right\} = 1 \text{ district.}$
10 districts	$\left\{ \begin{array}{l} 2\frac{1}{2} \text{ districts} = 1 \text{ section} \\ 4 \text{ sections} = 1 \text{ ark} \end{array} \right.$	$\left. \begin{array}{l} \\ \end{array} \right\} = 1 \text{ ark or harbor.}$

In the above table there runs the following subordinate decimal system :

- 2½ tons make 1 bin
- 10 bins make one lighter.
- 10 lighters make one ship-load.
- 10 ship-loads make 1 wharf.
- 10 wharves make 1 section.
- 10 sections make 1 ark or harbor.

Now, it has been already shown how from the standard cube I descend (unifying as I go the grandest system of weights—the Anglo-Saxon—that the world now possesses) to the very ultimates of troy, apothecary, avoirdupois, and standard weights. Let me, however, add, before dropping this explanation, that it is evident, that though I consider the ultimate = (0.00285 exact cubic inch pure water at mean temperature and pressure) a small enough subdivision to denominate here by a special name, nevertheless, shall science find it necessary to decimate the ultimate, or grain, or the ounce, it can do so to the very limit of numerical capacity by simply removing the decimal point one place farther to the left at every division by 10. In this case, if a name be necessary, I should denominate (following our now well-known monetary phraseology of dimes, cents and mills) .000285 = 1-10 of an ultimate a "dimultimate," .0000285 = 1-100 of an ultimate a "centultimate," and .00000285 = 1-1000 of an ultimate a "milleultimate," &c. In a similar way we can have dimegrains, centgrains and millegrains, and dimeounces, centiounces and milleounces, &c.

One can hardly imagine even that the remotest science will ever be able to appreciate so small a quantity as a millionth of an ultimate. Nevertheless, as mathematics may write and employ in calculation a millionth even of a millionth (.0000000001) of an ultimate (.00285) this system admits of it in an exact number = .000000000000285, since the figure 5 in 285 is always final.

For making standard weights of comparison in each of the several branches of the system as rectified, I can of course employ any suitable material as heretofore; but I intend

to employ particularly, and for several special purposes, certain specified substances now to be noted, and which I have discovered are pre-eminently suited for the purpose, to wit: I shall probably employ an alloy so proportioned as to have a specific gravity of 5.7 water, &c. It is the density 5.7 that I care for more than for any particular kind of metal or alloy; hence I shall simply call it an alloy or substance whose specific gravity shall be 5.7 water. This substance I intend to use for the manufacture of "weights of comparison" particularly. As an example, I will note that an alloy of copper and aluminum will be the probable basis of this class of weights. It may be here noted that: $\frac{1}{2}$ [1 part copper (specific gravity $8.8 \pm$) + 1 part aluminum (specific gravity $2.6 \mp$)] = $\frac{1}{2}$ ($8.8 \pm$) + $2.6 \mp$) = 5.7. This alloy will afford me a very beautiful and durable standard material. Zinc, $\frac{1}{2}$, and copper, 1, would also form a good basis. The ordinary pure lead, specific gravity 11.4, equal to $(5.7) \times 2$, will also afford me a good pure metal to work upon for more compact weights. Thus lead hardened with zinc and antimony, and then again alloyed with a heavier metal to bring it back to specific gravity 2, (5.7) will give me nature's own substance for ordinary and hasty weights of commerce. Iron, however, fits my system very beautifully as a substance out of which to manufacture weights suitable to my scheme of subdivision, and for this reason: Since my standard cube of 125,000 cubic inches of 5.7 density material will exactly balance an amount of water (pure and at mean temperature and pressure) equal to 125,000 cubic inches \times 5.7 = 712,500 cubic inches water, and since I can easily obtain an iron whose specific gravity is exactly 7.125 pure water, &c., it follows that $712,500$ cubic inches \div 7.125 = 100,000 cubic inches of such iron will exactly balance my standard cube. Now, my tables show that a standard cube actually weighs 25,000 rectified avoirdupois pounds; hence 100,000 cubic inches iron equal 25,000 rectified avoirdupois pounds. Therefore, 4 cubic inches iron at 7.125 specific gravity equal 1 pound avoirdupois rectified, and 1 cubic inch equals 4 ounces, and $\frac{1}{4}$ cubic inch equals 1 ounce, &c.; and since my unit ounce is common to all the branches of the system, it likewise follows that 3 cubic inches iron at 7.125 water equal 1 pound troy and apothecary rectified, 4 cubic inches equal 1 pound avoirdupois rectified, and $2\frac{1}{2}$ cubic inches equal 1 pound standard rectified.

The beauty with which my system not only rectifies the Anglo-Saxon weights, but draws upon nature herself to furnish man with standard weights of comparison, (5.7 material), hasty weights, (lead, 11.4), and commercial weights, (7.125 material), &c., is just as apparent as the idea is new. The fact is, weight, capacity and dimension are laws of nature—(man cannot originate an arbitrary one, as the French have attempted to do in their metric system, and have it survive the test of practical experience)—and I verily believe that I have discovered those fundamental principles, moduli, units, and specific gravities by means of which these things harmoniously exist.

So much for the weight measures of my system. It will be noticed that with the unit-ounce weight we can form pounds of any desired size—*e. g.*, 20-ounce pounds, $16\frac{1}{2}$ -ounce pounds, $18\frac{3}{4}$ -ounce pounds, &c., and rectify thereby and by the grain and ultimate all Anglo-Saxon weights whatsoever.

I will now turn to capacity-measures, which are intimately connected with those of weight.

Since an ounce weight of pure water at mean temperature and pressure equal 1.78125 cubic inch was the unit by means of which I have already shown Anglo-Saxon weight-measures may be unified, so I have also discovered that its cubic space (*i. e.*, that occupied by one of my rectified ounces of water equal 1.78125 cubic inches, exact) shall and must be the unit ounce of capacity. For example, a United States liquid-measure pint equals 4 gills, but a gill equals 4 ounces; therefore a pint equals 16 ounces, or at the capacity of my unit of capacity equals $1.78125 \times 4 = 28.5$ (exact) cubic inches—that is, it is $28\frac{1}{2}$ cubic inches, neither more nor less, and therefore it has the same capacity of 10,000 ultimates or of 7,680 grains, as already fixed in my foregoing discussion. The unit

being as above, I will now show the Anglo-Saxon capacity-measures, both liquid and dry, under its unifying influence.

UNITED STATES LIQUID MEASURE RECTIFIED.

4 oz.=1 gill	=7.125 (exact) cu. in.		
4 gills=1 pint	28.5	"	"
2 pints=1 quart	57.	"	"
4 quarts=1 gallon	228.	"	"
62½ gallons=1 hogshead	14,250.	"	"
2 hogsheads=1 pipe or butt	28,500.	"	" =1,000 pts.
2 pipes=1 tun	57,000.	"	" =1,000 qts.

I believe that the hogshead should be 62½ gallons instead of 63, as by my present statute. The cubic capacity of a hogshead would then equal 14,250 cubic inches, that of a pipe 28,500 cubic inches, and of a tun equal 57,000 cubic inches, and the beauty of the decimal sequence be very apparent, as well as the utility to be derived from the cubic capacities 7.125, 57 and their multiples. It will be noticed that these are the specific gravity numbers of iron and of my standard material; hence a cubic inch of iron at 7.125 placed upon a scale or balance opposite any empty capacity-measure whatsoever, and the latter filled with pure water at mean temperature and pressure until they balance, the water-line marks off 1 gill. So, 10 cubic inches of 5.7 material, balanced by water under standard circumstances, will show by the surface water-line in any capacity-measure its quart-mark, &c.

UNITED STATES DRY MEASURE RECTIFIED.

[The basis of the present measure (by United States statutes) is the "old Winchester struck bushel of 2,150.42 cubic inches." Now, I claim that this is an error, and that the true basis of the "old" struck bushel was 350 gills struck to 300—*i. e.*, 7.125 cubic inches \times 300=2,137.5 (exact) cubic inches. At this latter quantity I shall take it, since I am working upon and after truth and unification, and so long as this table of capacity-measure shall be deemed desirable, I claim and shall maintain that it is the true basis. Taking it at this value, it will be seen to have the capacity of 100 pounds troy (rectified) of pure water. The above being premised, I will now give what is the correct table, merely calling attention to the fact that like as the rectified liquid-measure pint corresponds in capacity to a 16-ounce weight of water—*i. e.*, to a rectified avoirdupois pound—so the capacity of a rectified pint of United States dry measure corresponds to a pound made up of 18½ ounces.]

TABLE.

	U. S. D. M	Cu. In.
1 pint =		33.3984375 (exact.)
2 pints = 1 quart	"	66.796875 "
4 quarts = 1 gallon	"	267.1875 "
2 gallons = 1 peck	"	534.375 "
6 pecks = 1 struck bushel	"	2137.5 "

THE BRITISH IMPERIAL MEASURE, (BOTH LIQUID AND DRY).

[Trautwine says the "basis is ten pounds avoirdupois of pure water at 62° Fahrenheit and 30" barometer." Hence as 1 pound avoirdupois equals 28.5=1.78125 \times 16, the true basis upon the rectified system is 285 cubic inches of pure water at 68° Fahrenheit and 30" barometer, or ten pounds equal one gallon. Hence the measures will stand as follows:]

TABLE.

	Avoir. lbs.	Cu. In.
1 gill =	.3125	8.90625 = 8 gills.
4 gills = 1 pint	1.25	35.625 = 8 gills.
2 pints = 1 quart	2.5	71.25 = 4 pints=16 gills.

	Avoir lbs.	Cu. In.	
2 quarts = 1 pottle	5.	142.5	= 4 quarts=8 pints=32 gills.
2 pottles = 1 gallon	10.	285.0	= 4 pottles=8 quarts=16 pints=64 gills
2 gallons = 1 peck	20.	} Dry Measure 570. 2280. 9120. 18204.	= 8 gallons.
4 pecks = 1 bushel	80.		= 32 gallons=16 pecks.
4 bushels= 1 coomb	320.		= 64 gallons=32 pecks=8 bushels.
2 coombs= 1 quarter	640.		

To the above systems I intend to add a new table, similar in its terms and subdivisions to that denominated "standard weight," and which I shall probably call "standard capacity-measure." It is needless, therefore, to repeat it here, for I intend to employ the same unit ounce of measure or capacity, (to wit, 1.78125 cubic inch), &c., that I have already established as the constant unit of rectified Anglo-Saxon measures.

Having now described my discovery, I will briefly reiterate that the principle I have developed, and upon which I work, is as follows: I shall take a cube of 50 linear units on an edge, and fill it with a material whose mean density is 5.7 at mean temperature and pressure. Then, since it contains 125,000 cubic units (inches) of such material, it must balance 712,500 cubic inches (units) of pure water under similar circumstances, and I declare that such a weight shall consist of 192,000,000 grains, or 250,000,000 ultimates. Now, if the linear unit shall vary so as to make our present authorized inch, either $\frac{1}{4}$ or $-\frac{1}{4}$ to any small degree, it shall not alter the arithmetical fact that I will still use 50 of such new units as the edge of my standard cube. I shall maintain that specific gravity 5.7 is the proper standard density in terms of pure water at whatever may be mean temperature and pressure of the earth, (I now believe them to be 60° Fahrenheit and 30" barometer), and I shall have the same number of grains and ultimates in the standard and unit cubes as I have above set forth. I will also say that it is manifest that to use any multiple of my discovered moduli is to encroach upon my formulæ. Having thus fixed my standard cube, and taken as my unit cube one of 1,536 such grains, or $\frac{1}{125,000}$ of the standard, I then establish the fact that as my ultimate will occupy .00285 cubic inches of pure water at standard temperature and pressure, and as my ounce shall contain 625 ultimates, therefore my unit-ounce weight shall balance 1.78125 cubic inch of pure water at standard temperature and pressure, or .3125 cubic inch of 5.7 material under same circumstances; and by this unit-ounce weight I intend to rectify all Anglo-Saxon weights whatsoever. I also declare that the space occupied by this unit-ounce weight, when in pure water at standard conditions—to wit, 1.78125 cubic inch—shall be, and is, the unit ounce of measure or capacity.

By and with these weights and capacities, and their multiples, ranging upward and downward over the whole field of weight and capacity, and which values I believe myself to have first discovered, I intend to rectify present measures, and to use the same in manufacture of weights and measures. I claim, therefore, the undoubted and sole right. Should, however, a standard density of more or less than 5.7 (exact) be desirable, as, for instance, one of $\frac{180}{10\pi} = \frac{180}{31.4159} = 5.729 \pm$ &c.—then the relations of the system to the standard cube of 50" on an edge will result in proportional figures. Thus, $125,000 \times \frac{180}{10\pi}$ will equal 716.187. \pm cubic inches of pure water at standard circumstances, and all the figures throughout would correspondingly vary. For obvious reasons, however, I am of the opinion that the standard density 5.7, without further fractional termination, and because of its simple relation to the cubic volume 712,500 through the cube of 50"=125,000, is the proper one to employ. The new principles upon which I have based the present system cover, however, a density of $\frac{180}{10\pi}$ as well as of 5.7 exact, whether I desire to employ it or not, and this is because I have been the first one to found a system of metrology upon a standard density such that it shall have particular relations to, first, geometric vol-

umes—for instance, cubes (50ⁿ)₃, &c.; second, specific gravities, (5.7, &c.=standard, 11.4=lead; 7.125=iron, &c.)

What I therefore claim as new, and desire to secure by letters patent, is—

1. Weights, for use upon scales, balances, &c., based upon the aliquot subdivision of a cubic inch of 5.7 density material, at mean temperature and pressure, into 1,536 grains and 2,000 ultimates, as and for the purposes specified.

2. Weights for similar use based upon suitable multiples of my standard density—to wit, 5.7 specific gravity—as and for the purposes specified.

3. Weights, for similar use, made of an iron or other substance whose density shall be 7.125 water, at mean temperature and pressure, or suitable multiples thereof, as and for the purposes specified.

4. Measures of capacity, liquid and dry, based upon the fact that the standard ounce or unit of capacity-measure shall have the same volume or occupy the same space (to wit, 1.78125 cubic inch) as is occupied by a unit-ounce weight, expressed in pure water under standard circumstances, as above described.

5. The combined system of weights and capacity-measures, unified as above by my formulæ and moduli, and with or without reference to any particular standard temperature and pressure, as and for the purposes specified.

6. Cubes (standard, unit, &c.) of material 5.7 times the density of water, at mean or standard circumstances, marked, stamped, or otherwise designated to show their value in aliquot parts, and their several relations to the foregoing system, as and for the purposes specified.

7. Cubes and other geometrical solids suitable for reference, and of specific materials, metals, alloys, &c., duly stamped, engraved, or otherwise marked, so as to show their relations to the foregoing rectified system of measures, for use as standards of reference, &c., as and for the purposes specified.

Witnesses:

H. A. SPRINGETT,
A. B. DYER.

C. A. L. TOTTEK.

NEW MEASURES OF THE GREAT PYRAMID BY A NEW MEASURER.

DESCRIBED BY C. PIAZZI SMYTH, ASTRONOMER-ROYAL FOR SCOTLAND.

PART II.—THE INTERIOR.

On changing from our late topic of the exterior to the new one of the interior of the Great Pyramid, much praise is due to Mr. Flinders Petrie for his grand handling of the measures made, and his apparently accurate connection of the ancient outside restored with the existing inside of the building produced so as to meet it; bearing in mind, however, that he is tacitly assuming the upper surface of the pavement, and not the socket corners of the base, as the level to be always referred to. The matter, however, immediately to be discussed, will not be sensibly influenced thereby.

First, for instance, comes that most strange fact, so subversive of Professor Lepsius and other Egyptologists' favorite "law of pyramid building," viz, that in place of the *subterranean* chamber being, as everywhere else with the subsequent and perfectly Egyptian structures of that kind, the first thing completed at the building of a pyramid, and

the object for which the whole edifice was to be afterwards erected by slow additions above ground, year after year—said subterranean chamber was never even approximately finished at the Great Pyramid. The vast size, moreover, of that unique monument is shown by Mr. Flinders Petrie to have been planned and laid out for that full size from the first, and by no means to have been a result of slow "accretion" dependent on the accidental duration of life of a single individual, according to the so-called "law" of a few modern doctrinaires.

But the sloping passage, leading down to that only commenced subterranean room, was beautifully built at its upper end; furnished, too, at the very top with a closely-fitting stone door hung on horizontal stone pivots, and cut off from all the rest of the interior by solid-looking masonry, which told no secrets to any man or nation until three thousand years had passed away. For then, in the hearing of Caliph Al Mamoun's workmen, who were rudely breaking a way for themselves through the limestone core, a prism-shaped stone fell out of the roof of the descending entrance passage (which was much closer to them at that moment than they had been aware of) and disclosed that another passage *ascended* into the interior from that point, but had its lower end plugged with, to them, immovable blocks of granite.

All this, however, is the old, old story of John Taylor's Great Pyramid theory, except the neat supplying of the door in the casing by Mr. Flinders Petrie; and which is not only likely enough, but is probably—from its having fitted close and got jammed after the days of the Romans—the very reason why the Mohammedans, under the eastern Caliph, did not attempt to enter the Pyramid in the right way by the "door," but broke in through the solid masonry below, and on one side, like the thieves and robbers they were. Breaking their violent way also round the granite blocks still plugging the lower end of the ascending passage; and then, whether there were many or few, more plug-stones above those we still see in place, got rid of them somehow or other, as by breaking and extraction, until they found the way clear before them up through the rest of that passage; thence, on the level of its upper opening, to the queen's chamber, by the still further ascending grand gallery to the ante-chamber; and then to the final king's chamber of red granite, with the coffer of the same material as its only contents.

The general structure, closeness and regularity of the joints in both the king's and the white-stoned queen's chambers, frequently come in for Mr. Flinders Petrie's high praise; though the building of the passages between (Mr. Wayman Dixon's girdle-stones of the first ascending passage excepted) is blamed for much rough and bad work. Some of it, indeed, as at the north end of the ante-chamber, being even declared so bad, as if it had been to show how badly instead of how well, as elsewhere, pyramid builders could build; while the well, leading down to the north-west corner of the grand gallery, through the grotto, to the lower subterranean part of the long sloping entrance passage, is stigmatized as very poor work indeed.

But the whole of these ascending passages and chambers are allowed by Mr. Flinders Petrie to form a system the like of which is known to exist nowhere else—*i. e.*, nowhere else adopted into a pyramid; for the peculiar trial passages on the Pyramid's own hill are recognized by him to be a reality. Though none of the Egyptologists can declare why, or wherefore, a vertical shaft is found there at the junction of the ascending and descending systems; or why, if there, a similar feature has not been found at the Great Pyramid.

So giving up the more difficult task of explaining that primeval monumentalization of so much that is rich and rare in thought, our new author proceeds to the far easier task of pulling to pieces my mensurations of 1865.

My angular measures, indeed, are usually left very nearly intact, but the linear measures are declared to have a small slowly-increasing error, due to measuring with loose rods on the sloping floor surface of dark passages; while at one particular place in them it is asserted my rods must have slipped, and a length of 2,173 inches been mistakenly reported

as 2,170. That is, fortunately, of no necessary importance, for I had already set forth in print that the 2170 looked like an accidental coincidence with a certain other 2170 number and was closer than warranted by the circumstances under which the measuring was performed. While, if it is also asserted now by Mr. Flinders Petrie that the grand gallery is really 1883·6, and not as I had made it, 1882·8 British inches long—whoever likes may look on that as enormously erroneous, but must confess it less discrepant than the three mensurations previous to mine, which were 1896, 1872 and 1824 of the same units.

But let us hasten on to the chief work of the interior, the granite king's chamber. What is the length of that? "Very various," Mr. Flinders Petrie would probably answer; and from a remarkable plate (xiii. and pages 79 and 80), wherein he shows the chamber's errors (largely produced, however, by mediæval earthquake shocks), concentrated on a plan of his own, multiplied fifty times, and looking, therefore, horrible—he would make its length at the top close under the ceiling 412'01; and at the floor, 412'66; I having made it at a few inches above the floor, 412'54, British inches.

Wherefore, if the room was only intended for funereal purposes, that was coming closer than there was any practical occasion for. But if it was also intended by the architect thereby to indicate the size of the exterior socket-base of the building by the theorem of the John Taylor system of explanation the measures are still close enough; but the required quantity is within the limits given by Mr. Flinders Petrie.

The grand attack, however, on behalf of Egyptology, is delivered upon the "coffer." That was, according to John Taylor, the vessel of whose cubic contents the old Anglo-Saxon *quarter* was the *fourth* part; and though it has some slight cuttings into its geometrical shape for apparently sarcophagus purposes, and may even have been used as such, it is yet a very remarkable mensuration-looking vessel, not only from its figure, but the absence of inscription, figuring or ornament, and for the striking manner in which it was at its remote age—long before written history—positively sawed out of extra-hard and dense syenitic granite, by huge bronze saws more than eight feet long, armed along their cutting edges with teeth of sapphires, according to the exceedingly ingenious speculations of Mr. Flinders Petrie, and the interior drilled out by similarly jewelled tubular drills three feet long.

He set to work, therefore, on his mensuration *critique* with zeal extraordinary, making off-set measures from no less than "388 points on the outside to 281 on the inside, or 669 in all; besides taking 281 caliper measures" (p. 84). Magnificently accurate results would this have given, had it been performed 4,000 years ago, on the then whole and entire vessel; but it has not the power, and Mr. Flinders Petrie's description by no means enables his readers to realize the fearful amount of the substance which has been broken off and carried away at some time or times before he came to measure it. He may be the best measurer that has ever appeared at the Great Pyramid, and his measures may, or as he not obscurely informs the world, must be, the only ones to be employed in future Pyramid investigations, not only of a single block, such as the coffer, but of congeries of blocks, which are now cracked and separated by pressure and seismic violence out of the relations in which they once stood to each other. And yet some persons will maintain, on the opposite side, that where much material of an ancient and otherwise unknown form has been long since removed—or a solid block been crushed—lost is lost, and gone is gone so completely that no one now living can pretend to be perfectly capable of exactly restoring it all.

Such, however, as Mr. Flinders Petrie measured and added to by calculation he gives thus for the "coffer" (p. 90): Contents, 71,960; solid bulk, 70,630; volume over all, 142,590 British inches; while four times the earliest known Anglo-Saxon quarter measure of wheat is usually assumed, though with large margin of uncertainty, as 70,982 British cubic inches, or between his two first statements.

With similar approximating results we might go over his measures of the ante-chamber

where the theoretical quantities, as hitherto stated for the John Taylor theory, seem always to be found among the lesser and greater measures Mr. Flinders Petrie gets of the ruined or dislocated forms; though, instead of accepting them as in any way confirmatory thereof—or, as I have so particularly set forth in 'Our Inheritance' fourth edition, as a rude index to more exact things in the king's chamber—he prefers to inveigh against both the errors of the ancient work and the gullibility of modern theorists.

This is the case especially with the "boss" of the granite leaf. He allows there (p. 71) that the measures of its thickness are, some under, some over one inch; and of its breadth, some under, some over the five inches claimed for it. But then he considers that he has already smashed the whole theory by declaring that such a projection was a common feature left on granite blocks to assist in moving them; and he has found, by looking narrowly with a side light, traces of there having been once some much larger bosses on the granite stones in the king's chamber. To all which we can reply—that those bosses were by Mr. Flinders Petrie's own measures neither of the right size nor in the right places to serve the metrological purpose of the one boss on the granite leaf. While as to a boss having been a common feature for the lifting of blocks in old Egyptian buildings, that is exactly what has saved that one particular boss from special destruction during the ages that are passed—just as the numerous burial pyramids round about the Great Pyramid have saved that one through all history from peculiar Egyptologic devastation, and enabled it faithfully to carry on to these last days a prophecy breathed into it of old by inspiration from the God of Israel.

But in the queen's chamber examinations something rather *morally* instructive comes out. Mr. Flinders Petrie describes the niche there as being, in its several parts, 3 or 2 or 1 or $\frac{1}{2}$ cubits in measure; such cubit being always with him the cubit of idolatrous, Cainite, ancient Egypt, 20.6 inches long, with limits "of—0.66 and + 0.36 inch," while he intensifies that finding by adding thereto (p. 68) "and there is no evidence of a cubit of 25 inches here!"

This is doubtless in allusion to my having claimed the remarkable eccentricity of the niche in the east wall of its chamber—amounting by the measures of several critical explorers after me to 25.025 British inches (see p. 425 of 'Our Inheritance in the Great Pyramid,' edition 4), as the most admirable and scientific method that could well be imagined for representing one single concrete example of a short linear standard, in an unexpugnable manner in a vast building. It was also a splendid illustration of the general metaphysical ruiting of the John Taylor theory of the Great Pyramid—viz., that though it was erected by Egyptian laborers, and even built to Egyptian measuring rods in each small step by step, it was yet caused in its whole result to bring out a purpose of an overruling divine influence which, as I have dilated on years ago in 'Our Inheritance,' the Egyptians did not understand, and never came to understand through all their history, and would not have liked if they had understood it.

So here, before our eyes, is an enthusiastic young modern Egyptologist, delighted to bring out the Cainite cubit of old Egypt into honorable notice for small things, and actually declaring (p. 68) after doing so, "there is no evidence of a 25-inch cubit here"—although, too, he had himself just measured the eccentricity of the niche, and found it, at its lower, larger and most important section, 25.1 British inches! What is not this, therefore, but the modern Egyptologist falling into exactly the same pit of blindness and unbelief that was prepared for the native idolater of that country of old. He, that pure and perfect one in his own eyes, used the profane cubit in his own forced work at the Great Pyramid, and never saw that it was being overruled then and there alone throughout Egypt, to bring out, in terms of the sacred cubit of Israel and the Bible, higher things than he and his co-false religionists had ever dreamt of.

Hence I have nothing to alter in regard to what I have written during years past, either on the queen's chamber niche and its eccentricity sacred cubit by measure, or of the

ancient Egyptians from the Biblical point of view, or yet of the tendency of modern Egyptological studies. In fact, this very clever book of Mr. Flinders Petrie supplies so many further examples of the same kind, that I do hope the *Banner* editor will grant me space for at least a few lines touching two more of them.

The first case comes on thus: The young Egyptologist concludes one of his chapters grandly with commendations on the accuracy of the Greek historians, especially as compared with modern travellers; but it is only on such points as will not interfere with his own views in general. So, although he glorifies their reported lengths of the base side of the Great Pyramid in terms of nearly unknown units and standards of measure, he says nothing, so far as I can find, of that most telling account in Herodotus' best manner, touching the shepherd Prince Philition having been, in the eyes of the Egyptian people, the effective ruler and director of the two greatest Gizeh Pyramids. Now, from the first publication of John Taylor's 'Who Built the Great Pyramid,' to the fifth edition of Charles Casey's 'Philitis; or, the Mystery of the Great Pyramid Solved,' that Greek admission of an extra-Egyptian and eastern influence prevailing peaceably over the King of Egypt at that time, is to all earnest Christian believers in the Bible the most precious key to the mode of introduction of Hebraic divine inspiration into the plans, proportions and ultimate objects for building the Great Pyramid; Philitis or Philition having been certainly a shepherd prince of Palestine, and probably either Shem or Melchizedek.

Nor did the divine inspiration at the Great Pyramid, so far as all history and antiquity may prevail to indicate, extend to a single other individual beyond Philitis. At the construction of the tabernacle in the wilderness, many hundred years afterwards, it was far otherwise. For there, the Scriptures declare that not only did Moses receive instructions from God, but the workmen under him, as Bezaleel, the son of Uri, was filled (by God) with the spirit of God in wisdom and understanding and in knowledge, and in all manner of workmanship (Exod. xxxv.). And still more widely in Exod. xxxvi. "Bezaleel and Aholiab, and every wise-hearted man, in whose heart the Lord had put wisdom, even everyone whose heart stirred him up to come unto the work to do it." But there were no such workmen known at the Great Pyramid. They were born Egyptian idolaters all, and remained so throughout, notwithstanding that other sentence in those accurate Greek writers, but which Mr. Flinders Petrie nevertheless declines to give any place to—viz., that the idolatrous temples of Egypt were forcibly closed during the whole time of the building of the Great Pyramid of Gizeh, and only reopened, and then to worse idolatry than ever, in the times of King Mencheres, of the third pyramid.

Unwilling then, and idolatrous still in their hearts, as the Egyptian workmen at the Great Pyramid were, how can we expect otherwise than that they scamped their task-work on every possible occasion; or just as the sharp-eyed, keen-witted Mr. Flinders Petrie finds so many examples of? We must, therefore, really and heartily thank him for dragging these peccadilloes to light, and for reminding all Christian pyramid students thereby that the mere workmen's handiwork at the Great Pyramid, having nothing of divine inspiration directly about it, was not, and could not have been, perfect. The cutting and placing, therefore, of stones, and the stones themselves of the Great Pyramid, are not to be regarded with worship by anyone, and are only to be held in any account at all by any believer in the Bible, in so far as they may enable us to approximate to where the divinely inspired ideas were centered—viz., in the spirit of the superintending Melchizedek, or Philitis.

We may truly rejoice, therefore, that Mr. Flinders Petrie has so many cases of error to charge against the idolatrous Egyptian workmen, as when he finds that in sawing the end of the coffer they twice over got their saw too far within the appointed line, and had to "back it out" and try again. Said saw, too, of brass and iron, set with jewelled teeth, being further so amazingly like what we might expect to find among the Cainite Eyp-

tians, after what the Bible has said of the inventions and constructions of Jubal and Tubal Cain.

But when we arrive at last at the all-important chronological date at which these memorable Pyramid events took place—alas! how Egyptianized has not Mr. Flinders Petrie himself become in six short years; for in 1877, in his then deeply-studied Pyramid diagram, he attacked the John Taylor passage theory, because it did not give the dates of either the Septuagint or the Hebrew version of the Bible, and condemned my 2170 B. C. date of the Great Pyramid as being too early, because there were not (in accordance with those Biblical chronologies) enough men on the earth so soon after the deluge or babel to erect such a building. But now he drops the 2170 B. C. date (pp. 188 and 191) because it is not agreeable to modern Egyptology; and while suggesting 3400 B. C. for discussion as more likely, says not a word about its flat contradiction to both of his formerly quoted sufficient authorities—viz., the two chief versions of the Scripture history of the world and man.—*The Banner of Israel.*

THE LOGIC OF THE PYRAMID.

BY CAPTAIN R. K. CARTER.

PART II.

In the first article, under the above title, we showed that the great argument from design finds the same ground for support in the Great Pyramid of Jeezeh as it does in the curious coral formation called Neptune's Cup, and the strange carnivorous or insect-eating plants; and we further submitted the claim that the building of such an edifice, containing so many wonderful correlations of measurement, was and is an absolutely impossible problem for the unaided mind of man. Upon this last claim the whole case of the inspiration of the Pyramid could be safely rested, but we propose to carry the matter very much further, by passing from the argument of design into that which we will call *scientific demonstration*. We use the term advisedly. It has been said that the inspiration of the Pyramid and of the Bible cannot be *mathematically* demonstrated. Sceptics call for reasoning similar to that used in geometry, and refuse to listen to any other. Jesus Christ said: "If they believe not Moses and the prophets, neither would they be persuaded though one rose from the dead"—and humanity has not altered one whit since the days when the Saviour was upon earth. We feel convinced that no proof will ever convince a man who is pre-determined to doubt and disbelieve anything that savors of spiritual things. Nevertheless, we thank God that we have been permitted to first place before the world, in answer to the sceptic's call, the very mathematical proof desired. We refer to the feature which we have styled the Impossible Problem. In geometry numerous propositions are proved by the method known as the *reductio ad absurdum*—everything to the contrary is shown to be untenable, and therefore the truth of the proposition is sustained. When we showed that the planning and construction of the Great Pyramid was a feat impossible for any man or collection of men, in any age of the world, we hold that, by the same geometrical method of the *r. a. a.*, we have proved the truth of the proposition that the builder was either superhuman or superhumanly inspired. But of this, more anon.

Let us now take up the scientific demonstration of the inspiration of the Pyramid. We use the term scientific, because the method to be followed is the same that is pursued by all investigators in any branch of science. As the former argument will best apply to those who do not accept God's revealed word, so this will adapt itself more readily to

those who believe the Bible to have come from God ; but at the same time it furnishes an excellent link in the chain of evidences of the truth of that word. All will admit that the Bible in full has existed for hundreds of years before the measurement of the Pyramid was ever thought of. Then let us note the following relations existing between the measurements of several Bible structures and those of the chamber and coffer in the Pyramid. First, the ark of Noah had a capacity exactly equal to that of the coffer multiplied by 100,000. The ark of the covenant had a capacity of 71,250 cubic inches, exactly equal to the capacity of the coffer, and hence equal to the same fractional part of Noah's ark as the coffer. The court of the tabernacle, *leading to the ark*, measured 50 cubits everywhere ; and, leading to the coffer, are the 50 courses of masonry on which it rests. These 50 cubits equal 1,250 inches, and this multiplied by 5.7 (the mean density of the earth) gives again the capacity of the ark and coffer. Next, Solomon's molten sea had a capacity (of mean earth matter) of 625,000 cubic inches ; multiply this by 5 and we have 3,125,000, the number of square inches in the court of the tabernacle. (5 is not taken at random, but is a special number present everywhere in the chamber). Again, the water capacity of the molten sea was 3,562,500 cubic inches, or exactly 50 times the capacity of either ark or coffer. The king's chamber in the Pyramid has in its walls five courses of masonry, laid horizontally ; and the coffer is just as high as the lower layer. The entire volume of the room, from the floor to the height of this first layer, equals 50 times the volume of the coffer, or equals exactly the molten sea.

Now we come to the Holy of Holies, the chamber where God visibly abode. It measured 20 cubits every way. The great brazen altar was 20 square and 10 high, giving a volume of one-half the Holy of Holies. But the area of the tabernacle court, 3,125,000 multiplied by 20 equals 62,500,000, which is the cube of the altar and also 100 times the molten sea, or 5,000 times the capacity of ark and coffer. Finally, the capacity of these last was 12,500, and the capacity of the Holy of Holies was 125,000,000 cubic inches, or just 10,000 times the former. There are a great many ways in which the measurements of the Holy of Holies stand related to the earth, as for example: in its polar diameter, mean density, cubical contents and actual weight ; but the above comprises all that is necessary to show the undeniable plan running through each and all of the structures mentioned. We come now to the argument deduced from the observation of the facts. If a scientist should have five fingers of a hand buried in the earth, and upon examination discover that the different joints exactly fitted together, he would at once exclaim : "These are all members of the same hand"—and no one would think of denying the assumption. If he found four fingers together, and after noticing the nice precision with which they were placed side by side, and with which they worked against one another, should find a fifth finger at a distance which, when placed by the others, exhibited the same general proportion and fitted at the joint with absolute smoothness, again he would claim that the same arm had controlled them all, and the man who attempted to deny it would be looked upon as a fool or an ass. This would be a clear case of scientific demonstration. Now this very thing has been done and is shown above in the case of the Pyramid. We have for the first finger the ark of Noah ; next the ark of the covenant ; then the Holy of Holies, and the molten sea, making four fingers which we who believe the Bible know to have been specially shaped by the inspiration of Omniscience, and which even infidels must admit, have stood upon the pages of the Bible for thousands of years as the ostensible word of God. These four fingers have been shown above to work harmoniously, and to display a wonderful interrelation in all their numbers ; and now we have found a fifth finger—the chamber and coffer of the Pyramid—which displays the same curious plan, and, when applied to the rest, fits into its place with an absolute perfection never attained in ordinary science, and at once calls forth the logical and scientific declaration, *this belongs to the same hand and was evidently controlled by the same arm*. Is anything the matter with that logic ? Let us see who will undertake to refute it. Had Professor Huxley succeeded in discovering

links in the chain of his few lame prehistoric horses, joining them to the modern animal with one-tenth the accuracy of the above evidence, he and the whole scientific world would have clapped their hands in delight at the wonderful proof of the theory of evolution. But such proof being, as they themselves candidly acknowledge, totally wanting, they simply prove the truth of the old proverb, and straining violently at the gnat of divine causation, swallow at one gulp the huge camel of their own sadly misplaced faith.

In closing let us summarize the above. First we have the argument of design, so startlingly set forth as to admit of no denial, and as John Stuart Mill reluctantly confessed where there is design there must have been a designer. Next we have a proposition to be proved geometrically. It is this :

“THE BUILDER OF THE PYRAMID WAS INSPIRED.”

Let us suppose that he was not inspired. He then was an ordinary man. But the coffer alone presents so intricate a plan that no man could possibly have designed it, not to mention the chamber and the Pyramid itself. Therefore the supposition that the builder was not inspired results in an absurdity, and hence the proposition is proved, Q. E. D.

Thirdly, we have the philosophical or scientific argument, deduced from observed facts, that the Pyramid exactly corresponds and is interrelated with four structures known to have emanated from the hand of God ; and, as this correlation passes all bounds of possible coincidence, it must have come from the same hand. We then close with these questions :

- Who made the carnivorous plants ?
- Who made Neptune's cup ?
- Who made Noah's ark ?
- Who made the ark of the covenant ?
- Who made the Holy of Holies ?
- Who made the molten sea ?
- Who built the Pyramid ?

Its very planning remains to this day, for any man, an IMPOSSIBLE PROBLEM.—*Heir of the World.*

* BIOGRAPHY OF REV. SIR HENRY B. WREY.

“The Rev. Sir Henry Bouchier Wrey, 9th Baronet, was born in 1797, succeeded his half-brother, Sir Bouchier Palk Wrey, in 1809 ; was educated at Balliol College, Oxford, where he took his M. A. degree in 1821. He was appointed Rector of Tawstock, and a J. P. for Devonshire. The family motto is, “*Le bon temps viendra*”—“The good time will come.” The family of Wreys is of considerable antiquity in Devonshire and is supposed by Wotton to be descended from Robert le Wrey, who lived temp. Stephen. Sir Chichester, the 2nd Baronet, a faithful adherent to the royal cause, became in 1652 possessed, by marriage, of Tawstock—another family seat, being Holne Chase, Ashburton. After the Restoration he was successively Colonel of the Duke of York's regiment, Governor of Sheerness, and M. P. for Lostwithiel. Sir Bouchier, the 3d Baronet, served under the Duke of Monmouth, and after the Restoration commanded a regiment of horse. The 5th and 6th Baronets were each Members of Parliament. The Wreys came into North Devon in the reign of Elizabeth as the Earls of Bath, armed with large powers to sweep

* Extract from an obituary notice in an English paper, 1882.

away popery out of that part of the country. The deceased was at the time of his death president of the Barnstaple Conservative Association. On his re-election to that office—although then believing himself to be on his death-bed—he penned a beautiful letter to the columns of this paper, which was published on Sept. 30th, manifesting his deep interest in the cause, and his apprehensions as to the effects of modern radicalism. Since that time the deceased lingered on, sinking and rallying alternately, until a few weeks ago, when a decided change took place, and retaining consciousness up to very recently, he succumbed to the ravages of old age, and passed quietly away at the age of 85."

This fine old man was always a staunch member of the Church of England, as by law, and history, and the wishes of the people long since established. He inclined, therefore, rather to what is now too often called the Low Church party, and had the good of the mass of the population around him always most sincerely at heart, taking almost as much interest in their schools as in the Church. It was in his visits to the schools of the parish that he was first confronted with the over-zealous proceedings of the French metric advocates, who for a time got the upper hand with some members of the British Government in London, prevailing on them to send large printed placards of those most revolutionary, most un-Anglo-Saxon weights and measures, framed and varnished, to be hung up before, and learned by heart of English children, in every national schoolroom throughout the country.

Now Sir Henry had already not only become acquainted with the Great Pyramid system of weights and measures, but believed that it was given originally by divine inspiration; also that the British system was descended from it, and to be perfect should be brought back to it again, and might most easily be by some very minute alterations. He writhed, therefore, in spiritual agony, at seeing his beloved school-children compelled by a pseudo-government order to forget or despise their own national and hereditary system, and learn day by day a totally different modern invention, prepared by foreigners in the midst of a national phrensy of atheism and revolution among themselves.

But "the good time" of his motto came at last. The eyes of Government were opened. They saw that it was not the British *people* that wanted the French measures to be made compulsory over them, but a little knot of secret agitators. So a second order was sent out to take down the school placards again, which, moreover, had never been legalized. No sooner was this known than Sir H. Bouchier Wrey instantly went over to his parish school, and not only assisted in tearing down the detested document, but in breaking up the varnishy thing, and putting it into the fire; "and," as he wrote to a friend in Scotland, "it burnt well!"

Since then he has ever been an interested watcher of Pyramid progress; the rise of the Pyramid subject in America; the failure of rationalistic science, though supported at enormous expense, to beat the Pyramid sun-distance of old, and the beginning of the accomplishment of the Biblical prophecies of these latter days. His great age at this time prevented his doing more; but he lived up to his last day in the firm belief that though "the enemy would come in like a flood, the Lord would lift up a standard against him."

Sir Henry published an essay on the Great Pyramid subject in 1874, entitled "Notes on the Great Pyramid," which went through two or three editions.

C. P. S.

LETTERS.

LETTER FROM LT. C. A. L. TOTTEN.

GARDEN CITY, L. I., Feb. 7th, 1884.

My Dear Sir:—I have for a long time been intending to write you and congratulate the Institute upon its Magazine. To me each number seems an improvement upon those which have preceded, and the January number is unquestionably a most able and interesting one. I am particularly struck with Jacob M. Clark's discussion of Ballard's theory, and am convinced that he has conclusively shown that Mycerinus and Cephren were pyramids built by Pharaohs, who, so to speak, "knew not Joseph." Mr. Wood's contribution versus Petrie's book is also an opportune paper. I am now studying Petrie carefully, and find in it much that is of immense value to the theory of John Taylor. Upon its surface, and as read in his own work, Petrie's book seems to be inimical to the metrological ideas of our school; but when the measurements are viewed by themselves and upon their own merits, I find them not only of immense value but undoubtedly reliable, and I am forced to draw from them just the opposite conclusions from the author. While in Philadelphia last month I ran across a copy of John Taylor's original book, 'The Great Pyramid, Who Built it, and Why Was it Built?' I had not had it in my hands for ten years, so I bought it, feeling that I would freshen my mind upon the idea as originally propounded by that father of modern inquiry at Gizeh. Upon reading this interesting book I am filled with amazement, for I find that many articles from our ablest writers are simply wanderings over the paths originally staked out by John Taylor, and that we are expending too much time in re-proving what he so ably did years ago. I do not think that a better work could be done than to re-edit John Taylor's work, particularly his first part, which deals with the metrology of the ancient surveys, and mould it into a more modern shape. I verily believe that with the light which we now possess upon the monument—*so much more* than Taylor had—and with dates now true to several places of figures farther than his, some one could make a *conclusive* book. The man to do it is Jacob M. Clark. He and Taylor, so far as I have been able to gather from the published works upon the subject, whether within our own school or not, seem to have been, and to be, the best posted, and of a bent of mind best equipped to handle the subject of the ancient surveys of the world. Do try and induce Clark to undertake this work. I have loaned him my copy of Taylor, hoping that he will be tempted to the task. I would like to see this book, argument by argument and line by line rewritten, and only altered so as to furnish figures which were beyond the reach of Taylor, and yet which are now fully established and within our grasp. In the meantime I cannot suggest a more valuable companion for the pyramid student of our day—for every member of our Institute—than the same volume. It will save so much labor if they become familiar with this ancient pioneer.

By the way, I enclose a copy of that part of my system of metrology which is at present in condition to be made public. You will notice that I have patented it. I do this for several reasons. In the first place it is worth patenting, and as a new means of unifying our present system, I do not know how I could render the Institute a greater benefit than by securing such letters. You know it has been cast up against us, time and time again, by our enemies that our work could result in nothing *practical*. Here, then, is a direct refutation of the slander. The system which I have been fortunate enough to evolve from

Pyramid study is eminently practical, and whether or not it is that of the monument itself I verily believe that it is earth commensuric, harmonious, and of vastly practical Anglo-Saxon possibilities. I have yet another part—linear measure—to disclose in due time, and I doubt not my fellow-workers in the Institute will find in it as practical and as valuable ideas.

I firmly believe the Pyramid is built to teach us the true metrology, and I also know that this science is the very science of all others. It is a practical science, and I am going to study it from the practical standpoint. If we can show our opponents that there is a rich mine of ore of truly practical value in the Pyramid, they will soon cease asking the old and idle question of Nathaniel, "Can there any good thing come out of Nazareth?" and more than willingly obey the mandate, "Come and see!" Now the value of such a patent is, of course, a thing of the dim future; but as a scientific scheme, I firmly believe it is of inestimable worth. In the meantime, it has to the Institute a *practical* value. I want the Institute to authorize an expenditure of money under what we can now control, and help me manufacture a quantity of little "unit-cubes" of mean density material stamped and marked with their Anglo-Saxon references, for use in advertising our Egyptian Expedition. My idea is that we have such cubes made, and stamped with the arms, etc., reverse of the seal, and their reference to the 1" the 1"2, the 1"3 the ounce, pound, pint, etc., and put them out in order to get funds for the expedition. The little cube will be a thing of beauty and *practical* utility. It can be used as a *paper weight* and will at the same time be a most valuable advertisement of our Institute, and of what we are working to accomplish. If we can manufacture them for a nominal sum each, say 25 cents, they will easily sell for double that, and the funds to be derived be of no small account in assisting to equip the expedition. My idea, further, is that the upper face of the cube bear the inscription of our Institute. That another face have the arms and crest, the opposite one to that the reverse of the seal and the remaining 5 be devoted to metrologic references, etc. Tell me what you all think of the plan. I doubt not that we can find manufacturers who will undertake to make these cubes for us very reasonably and without any original outlay.

Now, I know that you will see the remarkable sequence and beauty of the system that I have evolved, and at the same time I know that you will be disappointed in it in so far as I fail to find any reference necessary to the analytical unit of the 360° circle. I do not believe in that division of the circle. I agree with Jacob M. Clark that it is entirely Babylonian, and savors of Nimrod and imperfection. The argument presents itself to my mind in this way—(and I find the stumbling-block insurmountable): A circle *cannot* be *geometrically* subdivided into 360 equal parts. No mathematician can get a sexagesimal degree. Is it to be presumed, then, that THIS monument, so perfect in all its metrological references, was built with any significance whatever to a circle of 360°? But if the circle of 360° falls, then likewise fall all the English inch references throughout the Pyramid. And that is just what I predict. The beauties you and Mr. Dow and others have discovered are *ratios*. This has been repeatedly pointed out both by Mr. Clark and myself, and yet to this day I fear that we two stand almost alone among American Pyramid students in advocating a 240° circle, and a 25 inch standard. However, I know your earnestness too well to fear the issue when once your own mind shall have been satisfied of these facts. The *value* of your work will remain, though the *reason* of it may become a different one. Each one of these beautiful ratios which you have pointed out will be an important factor in our grand argument in favor of this mighty monument, and I cannot but regret that up to the present time, while really laboring *together* towards the same end, we should have been led to interpret these readings in so entirely different a manner.

Now I never have been able to explain to my own mind how it was that several of our best workmen—yourself, Mr. Skinner, Mr. Dow and Mr. Searles, have so entirely ignored the 365.24224 reference in the primary base line, and the *numerous* other references to it

with which this building teems. Why the very number 116.26 + etc., which we find repeated there so often, is but the *ratio* of Y to π , in which $Y=365.24224$, and $\pi=3.14159265$, etc. True it is laid out in inches in the ante-chamber, but I am convinced they are and must be *Pyramid* or earth-commensuric inches. In this interpretation do you not see that you are directly against Taylor, Smyth, Baxendell and many others who have arguments in *their* favor quite as strong as those advanced for the present inch theory? But Taylor, chief of all—let me give the originator his full meed of praise—and to his book I earnestly request you once more to turn your attention. Give it a fair reading, and with that and Smyth's 'Our Inheritance' in hand, and Baxendell's formulæ in mind, see what a *light* your own labors throw upon the Pyramid regarded as a grand ratio, and a grander *harmony of ratios*. It is in these *ratios* and their PROPER interpretation that the true secret lies.

I have a very long and exhaustive argument in favor of the earth-commensuric theory that I have nearly ready for publication. It is the article I was writing when I addressed the long letter to the Institute containing the nine questions. But it is much too long to send to be read aloud or to be printed in the Magazine even in numbers. I am trying to induce an eastern publisher to get it out. It goes into this matter very deeply and draws upon the Pyramid and the ancient Hebrew system of metrology in a way that *I know will surprise you*. It will contain a great many diagrams too, which so far as the 25 inch cubit is concerned, I am sure will leave no room for doubt either of its value or its positive Pyramid reference—no more than we *now* have of its lofty earth reference. I do wish you knew of some one who would endow the Institute with a fund that would publish such papers, but how can we expect them to when even our able Magazine has to struggle so hard for an existence.

I congratulate you all upon the possibility of a speedy fruition to the American Pyramid Expedition, and would give most everything to be able to join it, as I have some notions of my own relative to its indications that I want to follow up. What are the present chances of the expedition for this year? Clark telegraphed you, I believe, about my last visit to Washington relative to the 'Great Seal.' Well, I accomplished little or nothing in that direction. I fear that the State Department will go wrong, as certain indications portend; but if it does, then it is because it is not yet time to appreciate the full light let in upon us by the true interpretation of this wonderful bit of symbolism. One might almost be led to the same conclusion from the disheartening response I have met with in my efforts to publish my 'History, Heraldry and Significance of the Great Seal of the United States.' I have struggled to get help for a year, struggled might and main, but actually have only about 130 names of people willing to help me! Could I only double that number, I would be all right, for I have found a publisher who will put the work out in good shape if I will guarantee him 300 names. I fully expected that in our Institute that number would assist, but I have of our members only about a dozen!

Write me at an early date what you think of the system of metrology, and let me know when you visit New York again.

Yours ever sincerely,

C. A. L. TOTTEN,
U. S. Army.

LETTER FROM J. K. HORNISH.

DENVER, COL., February 26, 1884.

Dear Sir:—Your favor of February 20th received. I appreciate your kind feelings for Gov. Lowe. My acquaintance with him began in 1850, and continued, until his death, friendly and intimate. I well knew his worth and zeal in all good causes.

I fear you have not understood my inquiry in relation to the North Star. I think I read in one of Professor Proctor's reviews of Professor Smyth that the *present North Star* was visibly manifest from the descending passage. Is this the fact? I understand that a retrospective calculation for 270 B. C. makes "a Draconis" the polar star at that date; but, my point is, does this passage *now look out on our present North Star?* My other point is, what relation does the sun sustain to the Pyramid at "high 12" vernal equinox? Does it cast a shadow on north side, or does it illuminate the north side—no shadow? These two points, or facts, are material to my estimate of the design and meaning of the *Kiops* Pyramid. My investigations were begun and prosecuted outside of all pyramidology as connected with Egypt. They are now only focalized on the Great Pyramid, because the philosophy of numbers and structure in theoremization culminates in such a symbolic structure. With me the point now is, is this Pyramid a structural theorem in stone, expounding God's philosophy of structure in numbers, and in the universe? If so, it must not only conform to the *philosophy* of geometry, but must be so located as to be a self-demonstrating theorem—a gnomon—of the earth's annual periodicity. If it is so constructed then, it is the embodiment of all prime metronomic elements and values, and must represent an inspired architect, as Professor Smyth claims, in a *lost philosophy*, which ruled the pre-mythological ages, and from which we have all our mystic geometrical symbols, the geometry of which is a mystery even to the most learned masons and Rosicrucians in the world; while this moral is made the theme of learned orations.

My investigations into the philosophy of numbers and structure make *seven the absolute constant*, and *five*, in its multiples and powers, the *universal ratio* of relation and value. These two truths and metronomic values are so certain that they wipe out all incommensurabilities—I have not struck one in eight years—and they have taught me how to formulate geometrical proportions, the *first terms only* being given, and to theoremize all proportions in triangulations. When this philosophy was worked through—seven years ago—the resulting theorem was the Pyramid, and since, I have been casually trying to get a few datic facts relative to the Jeezeh Pyramid, for the purpose of determining its archæological value, as well as its philosophical meaning and value.

I, for the present, do not touch the question of inspiration in the architect. The assumption is fair, so long as modern science does not even suspect the existence of a philosophy, in and by which the Great Inspirer of all intelligence has created the universe and all beings therein—a philosophy so all-comprehending and yet so prime in its essence that the *deka* (10) comprehends all its capable expressions. Man did not invent the digits; man cannot add to or take from them; and modern science does not even suspect that they articulate amongst themselves in exact geometrical metronomic values—exactly correlating all values in structure, or all values cognizable by human intelligence.

The Bible refers to an age when man walked with God. At that age God's philosophy of structure was understood and formulated. Our modern science is the expert relic, with the philosophy forgotten. The *Kiops* Pyramid may yet, in connection with all our mystic symbols, prove this suggestion to be true. And, if so, God and truth are vindicated as surely as a special inspiration can do—besides, "the conflict" of modern science will become the monument, folly and presumptuousness.

Yours truly,

J. K. HORNISH.

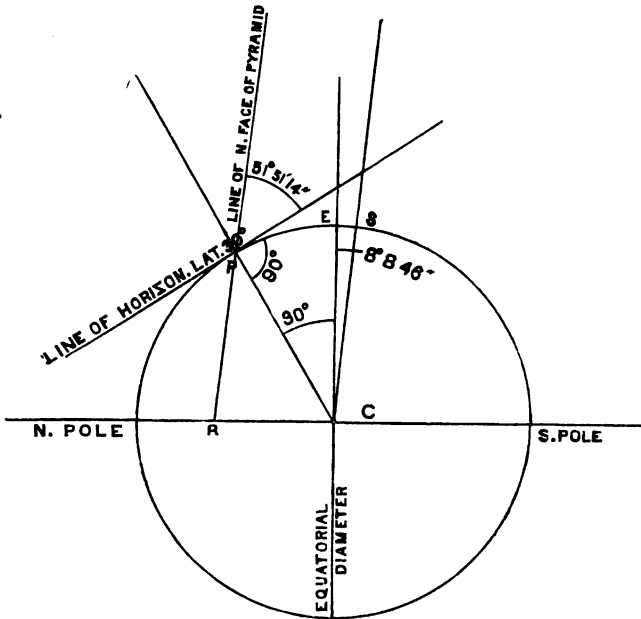
LETTER FROM REV. H. G. WOOD, REPLYING TO MR HORNISH.

SHARON, PA., April 2, 1884.

1st. The present pole star is not now to be seen from the interior of the entrance passage of the Pyramid. The altitude of the passage is 26° 26'. The altitude of pole

star latitude 30° is now at its lower culmination, $29^\circ 5' 45''$. In 1849 it was $1^\circ 24'$ from the pole. It has approached the pole annually since then $50''$. It is now distant from the pole $54' 15''$. Hence its altitude in latitude 30° is $30^\circ - 54' 15'' = 29^\circ 5' 45''$, which is too high by $2^\circ 39' 45''$ to be seen from the depths of the entrance passage of the Pyramid.

2d. "What relation does the sun sustain to the Pyramid at 'high 12' vernal equinox?" The following diagram gives the answer :



CS is drawn parallel to the line of the north face of the Pyramid. The angle $SCE = 180^\circ - (51^\circ 51' 14'' + 90^\circ + 30^\circ) = 8^\circ 8' 46''$; consequently the sun is about 8° south of the equator when he *begins to illuminate* the north face of the Pyramid at noon on his return from the winter solstice, or nearly one month *before* the vernal equinox.

I trust you will find these answers to the two questions, in your communication to Mr. Latimer, quite satisfactory. No doubt the Pyramid is a huge problem and of great intricacy. There is an important element yet to be contributed towards the solution of the problem, in the exact measurement of some points as yet not well ascertained. An expedition appears to be a growing necessity to accomplish the object. Hoping you will enjoy the INTERNATIONAL STANDARD,

I am, faithfully,

H. G. WOOD.

To Mr. J. K. Hornish, Denver, Col.

LETTER FROM C. PIAZZI SMYTH.

15 ROYAL TERRACE, EDINBURGH, Feb. 5, 1884.

My Dear Sir:—Your grand letter of January 22 has just arrived; its predecessors had been gradually advancing in character and importance as indications of the coming strug-

gle (friendly, intellectual, and without any manslaughter in it though it be) began to loom on the horizon of the future ; but this, your last letter, is quite a trumpet-note for preparation, each in whatever he may be able to contribute, and if you are working as we believe within lines foreordained of God, you will have a mighty spiritual army with you, helping you over many and many a difficulty, and ensuring the end at last, to those who fight valiantly ; for the Lord has never approved of cowards or idlers, but promises much to those who forget themselves in his service.

Already a friend in England has sent my wife a cutting from a paper there, the STANDARD, giving a paragraph descriptive of your intended expedition to the Great Pyramid, with three Americans, one Englishman and one Frenchman. If an international, or many national, character could be given at all, have you considered whether one Russian should be invited? Next to the Anglo-Saxon, the Russian has most resisted the French metrical system, and if you could penetrate through the mere superficial skin of the German exotic officials in the land, you would find the nation still opposed to it, still religiously guided, and still, for the due survey of their enormous empire, cultivating the art of mensuration and the science of geodesy.

In England it is far otherwise ; a hundred years ago, when the ordnance survey of Great Britain was started, scientific amateurs rejoiced in nothing so much as field-operations ; Ramsden made them theodolites, Traughton supplied them with Alt-azimuth circles, measuring-bars, chains and levels, while trigonometrical formulæ were discussed in all the scientific societies.

But now, what with the ordnance survey having very nearly finished off the whole of our little island's map, and the progress of physics and natural philosophy research, the great army of free and independent scientists has gone off into completely different lines of activity, and I really cannot at the moment, at all events, suggest the name of a single civilian Englishman living who has made himself known as an accurate surveyor.

Nor does there seem, after all, to me much need to search for such a one in England, or in France either ; for as a most distinguished Englishman of two generations ago set forth, the hopes of humanity in the present day rest mainly on "*bringing in the new world, to redress the wrongs of the old*;" agreeably with which your expedition, while duly attending to all which England, France and any other power may have already accomplished at the Great Pyramid, should be American entirely. Its members would possibly pull well together, and the whole work would be better done and more economically, while the size, grandeur, method and arrangement of your expedition would be such as infallibly to draw international attention to your proceedings, perhaps surround you at the place with busy critics, and perhaps also elicit some genuine and self-supporting offers of sympathy and co-operation. So, first and foremost I should like to hear of the whole of the American funds going to, not salaries to individuals, but the necessary expenses of the American expedition, as an expedition which is to crown all other pyramid explorations, and which is to work in the interests of the whole world, and of revealed religion as well.

Now you chance to have mentioned one New York paper, viz: the *Tribune* ; and I recently had a copy of that paper sent me for another purpose, viz., because it contained an essay on the recent remarkable sunsets, by Professor S. P. Langley, of Allegheny Observatory. A most excellent essay it was, the most philosophical and profound of any I have yet seen on that subject ; but I note it now because it brought up the name of an American astronomer whom I have known for many years, and have so highly appreciated his special and most original observations in many lands, that he seems to be one whom you should try to obtain on your side, viz : the Professor S. P. Langley before mentioned.

Now I have barely space to acknowledge how you astonished my wife with my portrait in your last number of the INTERNATIONAL. So kindly intended on your part, and

gracefully carried out, that I cannot presume now to make any further difficulty, though the oil portrait in your hall is rather too great an honor, and if it is the first, and for a time solitary, I hope it will soon be only one of a series of workers at the preserving and perfecting of primeval pyramid weights and measures.

Yours truly,

C. PIAZZI SMYTH.

LETTER FROM C. PIAZZI SMYTH.

ROYAL OBSERVATORY, EDINBURGH, Feb. 13, 1884.

Dear Sir :—This evening there arrived the tiniest parcel that book post ever brought, with a decorative sign of the International Institute for preserving weights and measures. What could it contain? Just one lithograph portrait, but that of the charming, the exemplary Abbé Chanoine Moigno, always on the excelsior path of advance in science, simultaneously with holiness to God, and faith in his written word. Such gentleness, combined with such firmness in a good cause, and capacity for enthusiasm in a high one, shine forth in his countenance, that I rejoice at this symptom of his portrait adorning, and truly so, the next number of your international journal.

The last number was a grand one in its papers, and you yourself described Luther and your country, as though you had been another Martin Luther himself. There is much more reading and studying for me in this number before I am able to write to you on some of the more important subjects, but on a certain short one why should I not attempt to set before you the thoughts that it gives rise to?

You have written to Mr. Gladstone, Prime Minister of Great Britain, requesting him to instruct some of the Royal Engineer officers at present actually quartered in Egypt and in the very line right between the Mokattam hills and the Great Pyramid, to measure that line from their own (*i. e.* the British Military Venus-transit Expedition of 1874) little stone monument erected in their camp on the said hills, as the place of which they determined the longitude telegraphically, to the centre of the mighty monument of old, the Great Pyramid, and thereby ascertain the longitude of that.

Why the officer in charge in 1874 did not make that little additional measure then, is almost inconceivable; for it amounted to the miserable egotism of preferring the camp where he had lived for a few days, and entertained sundry panhas and beys with coffee, to the one grand inspired monument of the whole earth, where it still stands, as our excellent friend Charles Casey puts it,

"Guarding historic right."

It was a moment of forgetfulness, as I always took it, on the part of a Christian officer and a gentleman, but one that on a second occasion either he or his brother officers should have been only too happy to rectify, too eager to improve; and none more so than the Prime Minister himself; for as a Free Church clergyman wrote to me recently from the west of Scotland, "Why do you not write to Mr. Gladstone to enclose, protect and repair the Great Pyramid, for he is, I believe, so holy a man that he would have all that carried out immediately for so sacred a monument." Now it seems that you have written to this remarkable man, into whose hands such extensive and unexpected power has been placed, merely to have the far smaller work of a little measuring done there by the officers of the British army who are accustomed to that kind of work, who are on the spot, and during peace cannot have much to do. And you have received an answer from the great man!

Does it satisfy—convince you? He says that in Great Britain the government rarely interferes directly in matters connected with scientific investigation; and therefore he does not see how he could himself further the object which you have in view. He suggests

whether it might not be worth your while to communicate with the Royal Society or some other scientific body."

As he does so say, perhaps it will be worldly wise on your part to apply to said Royal or some other scientific society in London, and if they undertake the work and perform it with the perfection and publicity to give it a national character, and compel the consent of the world, you will have gained your object, and the geography of the earth will know its central point.

But if each such private society declines—says that what you want is a piece of surveying work, which is the proper business of Government, which in Great Britain the Government *always* takes to itself, and does so throughout its Colonies; that its Ordnance Survey establishment at Southampton is a most stupendous institution, exceeded perhaps only by the Indian Trig. Survey, of which the Government in London has just published vol. ix, containing exactly such longitude results in principle as are now wanted for the Great Pyramid, and executed by three British military officers who have doubtless been several times through Egypt at their country's expense—what will you do then?

Alas! I fear some very bitter thoughts may arise, touching the Scriptural part which this country is destined to fill in the present stage to which history has reached. The thoughts will be bitter to you as well as to me, for in your last letter to me you were so beautifully and sacredly loyal touching the wonderful nature of the British occupation of Egypt in 1882. Both Bishop Bedell (U. S.) and yourself "considered it struck the last death-knell of slavery, the first being that which was heralded at the coming of our Saviour." The importance of that remarkable event you say cannot be overrated or overstated. Indeed it is in accordance with the views of Pyramid students, and surely this is the meaning of the 19th chapter of Isaiah. It is strange that the British and American flags were united together in Alexandria. We are brethren and we can never be disunited."

Now it is perfectly true that the sacred prophet does say that in a certain future day which we believe has now very nearly arrived, the Egyptians shall cry unto God in their distress, and "he shall send them a Saviour and a great one, and he shall deliver them."

I do yet hope and pray that this God-favored country of ours may be privileged to perform some part of the mission of that "Saviour" prophetically described by Isaiah; my hopes rest on the whole Anglo-Saxon race, American and British combined.

I remain, yours very truly,

C. PIAZZI SMYTH.

LETTER FROM L. BIDEN.

28 LION TERRACE, PORTSEA, Feb. 2, 1884.

Dear Sir:—Approaching the Great Pyramid of Egypt from any direction, it presents the form of the Greek letter Delta, and its shape was probably the origin whence tracts of country between the divergent mouths of rivers became so named generally.

The entrance approximately exhibits the Alpha, while the boss on the granite leaf shows the Omega, the actual investigation of the marvels illustrated by the structure started in the endeavor to pass within, and they may be fully explained, as far as intended, when the goal is reached by elevation of the suspended gate in front of ante-chamber.

The erection was unquestionably divinely inspired, and all others appearing to contain sepulchral recesses seem as certainly to have been built at the suggestion of our old enemy Satan to bring the original into contempt, by causing it to be classed with those following in closer or more distant imitation in some respects, and getting the whole described as tombs, while the tradition of the vast learning and power of the directing first constructor

led to his being regarded as a prince of magicians, quite in accord with the desire of the Devil, who knew without ability to comprehend the various uses of the artificial mountain, which is founded on the rock, though surrounded by sand, and has hitherto set the dilapidating effects of time at defiance.

Yours respectfully,

L. BIDEN.

LETTER FROM J. R. SKINNER.

110 BROADWAY, CINCINNATI, O., March 10, 1884.

Dear Sir:—Your article on Isis is very interesting, especially to me, as I have lately been reading Elliott's *Horæ Apocalipticæ*, which last seems to show a prophetic history.

In looking over the Magazine I see a fact noted which is worth considering. In examining the measures of the descending passage way, I found that Vyse and Smyth coincided as far as they went downward, viz: to the bottom of the ascending passage; commencing, Vyse at the edge of basement sheet, and Smyth from a point in the roof line. I speak from recollection—Vyse gave the vertical height of the edge of basement sheet from the ground as 49 feet, as given by Smyth. You will find the work in 'Source of Measures,' page 116. Vyse measured on down to the foot of the descending passage. Smyth measured the angle of the passage with great care and corrected Vyse as to this. I worked on these data, viz: (1) the 49 feet, (2) Smyth's angle, and (3) Vyse's measures; then (4) Vyse's restoration of the dilapidated surface, so as to make the total length of the passage "about 4126 inches." From these, and my modulus of supposed construction, I found the vertical height of the restored outer and lower lip of the descending passage way above the ground to be 31 Turin cubits, divided as follows: into 30 cubits, or 51.53 feet above the pavement, and 1.71766+ feet, the thickness of the pavement, making a total of 53.24766 feet, which is 638.971 inches. From Mr. Beswick's article in the Magazine, p. 47, as I understand him, Mr. Petrie estimates this same vertical height as 638.4 inches. That is, this proves within a very slight fraction, to duplicate Col. Vyse's restoration of the dilapidated outside, and if so, then we are to accept the interior measures as untouched by Mr. Petrie, which gives us, and must give us, Col. Vyse's measure of "about 4126 inches" as the length of the entire passage. I cannot see any way of avoiding this conclusion. This being the case, then my correction, founded on the discovery of the origin and length and use of the cubit measure comes in, by which this passage is $2062.647 \times 2 = 4125.294$ inches.

Such being the case, and Mr. Beswick showing such a confusion and blunder in one of Petrie's "careful" statements as he does, as to the very feature in question, viz: the base, then the question arises: Is it reasonable, "because Mr. Petrie was the last measurer," to accept his to the exclusion of (1), the French corps strictly under the command of Napoleon, equipped with every means for good work, and whose work in other respects has proven to be faithful and true; (2), the measures of Col. Vyse, founded on the most laborious investigation, with a great expenditure of money and labor, especially where his work in all other respects has been proven to have been "admirable;" and (3), the results of Mahmoud Bey, made under the command of so high and august a source as the Sultan?

Your friend,

J. R. SKINNER.

ADDITIONAL LETTERS.

Rev. James French, Philadelphia, Pa.
Charles N. Dubs, Oberlin, Ohio.

George Kellogg, New York.
W. E. Hingston, Buffalo, N. Y.

- W. J. Cockburn Muir, Melrose, Scotland. F. G. Williams, Adams, Oregon.
 F. Hess, Fort Dodge, Iowa. Hon. Martin A. Foran, Washington, D. C.
 W. C. Coffin, Allegheny City, Pa. Dr. G. W. Copeland, East Boston, Mass.
 B. A. Mitchell, Jr., Philadelphia, Pa. J. C. Wilson, Mitchell Square, Ont., Canada.
 E. Jane Copeland, Bryantville, Mass. S. H. Reeve, South Eliot, Me.
 Rev. Jesse Jones, N. Abington, Mass. Mrs. S. W. Libby, Boston, Mass.
 Charles T. Seymour, New York. George V. Watson, New York.
 Arthur C. Oakley, New York. Charles Casey, C. E., Carlow, Ireland.
 Mrs. S. A. Bradbury, Winchester, Mass.

 SYNOPSIS OF LETTERS FOR MAY MAGAZINE.

Mrs. W. A. Plumtre writes: "I am delighted with the January number. It was a charming thought placing dear Mr. Taylor and Piazzi Smyth vis-a-vis, and both are good. The contents of the number fill me with surprise and pleasurable emotion. How wonderful that Mr. Petrie should be turned into a witness for the truth of the theory instead of against it. The promptitude, decision and pains with which it has all been done, receive my warmest admiration and esteem."

With reference to the article, "The Altar and Pillar of Jehovah," Miss Alice S. Emerson writes: "I do not like the idea advanced in the last number, of Joseph's body being placed in the Pyramid. It is too material. I prefer to look upon it as entirely spiritual and symbolical. The coffer in the king's chamber took hold upon my fancy and imagination, and is not to be shaken off. I see some one agrees with me in the idea of its typifying the resurrection. I should like to know further of the writer's views concerning it."

Rev. E. P. Ingersoll, of Rosevale, Kansas, also opposes Dr. Redfield's theory that Joseph was the builder of the Great Pyramid and that his body was placed in the coffer.

Wm. E. Hingston, Buffalo, says: "I shall continue to fight for the STANDARD. I have already had many bouts with the enemy, and in all have come off victorious. Nine out of ten who are in favor of the metric system are so because of the decimal. They see the decimal only, not the great evil behind it."

Prof. W. A. Rogers, of Cambridge, writes: "Your half yard bar is at length graduated and I think you will be pleased with it. In one thing I have failed. I tried to rule a band of 10,000 to the inch, but the metal was not sufficiently hard to take good lines of that degree of fineness. I have also finished the companion of the yard and metre with my standards, and obtained the absolute co-efficient of expansion of the metre. I have yet to investigate the error of subdivision of both bars."

F. M. Robertson, M. D., of Charleston, says: "Your periodical grows in interest, and I pray that its influence in the spread of information on the noble subject which it so ably advocates may be widely spread."

Jacob M. Clark, C. E., writes: "I have been reading John Taylor's work on the Great Pyramid with a pleasure equaled only by my astonishment at the extent and soundness of his views. I am particularly struck with his idea that the sacred cubit and inch relate to the dimensions of the earth before the flood, while the Pyramid cubit, 25 inches, and the Pyramid inch express its measurement after the cataclysm. Of course we need but the one, the latter, yet how important to know all the facts that the monument reveals."

W. C. Cox, Mobile, Ala., says with regard to the expedition to Egypt: "The opening of the columns of the great New York dailies to our cause is most significant of real progress. I think it will be wise to have two or three members of the corps well versed in engineering, civil and mechanical, who are *not* committed to our belief regarding the Pyramid, that by the mouth of two or three (impartial) witnesses the truth may be established.

The N. Y. *Herald* will probably send a representative with the party, so that its operations from day to day will be published to the world."

H. L. Messervey, of Chelsea, Mass., referring to the call of the lost tribes into the American wilderness, writes: "When this emigration movement is fully understood, then the blind eyes will be opened, and Israel will understand the wonder-workings of our God. The prophecy, 'I will allure you and bring you into the wilderness, the people that were left from the sword found grace in the wilderness, even Israel when he went to cause him to rest,' was signally fulfilled in the coming of our forefathers. This nation is the stone kingdom of Daniel, and the Declaration of Independence is the corner stone on which the temple and city will be built; not a temple of stone, but 144,000 regenerated and perfected human beings. This nation is the eagle plucked from the British lion, and made to stand upon its feet (the eagle). A man's heart was given it, the Declaration of '76 (Dan. 7th chap). Here we see the woman clothed with the sun, and the moon under her feet, and on her head a crown of twelve stars, the twelve tribes of Israel. She is now in travail to bring forth the man child, the 144,000, which is the House of David. This is Joseph's land. Jacob said to Joseph, 'The blessing of thy father prevails above the blessing of thy progenitors, even to 'the everlasting hills' (the Rocky Mountains), and in the blessing of Moses upon Joseph he said, 'Blessed of Yahveh be his land.' Whose land! Joseph's, in contradistinction from the land promised to Abraham, Isaac and Jacob, and we see the blessing on Joseph's two boys literally fulfilled in this country. 'Let them grow into a multitude in the midst of the earth.'"

Rev. Joseph Wild, D. D., Toronto, Canada, writes: "I do think your Magazine is splendid; it improves with every number. I do not think it is surpassed by any periodical. I can do but little, but I often pray for you that heaven may guide and give you courage."

With reference to Mr. Gladstone's foreign policy, H. W. Oswald, San Francisco, says: "His predecessor, the late lamented Beaconsfield, had a clearer view of the destiny of Israel than has 'our William.' He was 'the Beacon' possibly too far advanced in his pronounced views regarding the future grandeur of the Saxons, but one short month of his able management of Britain's policy, at the beginning of either the Irish or Egyptian muddles, would have put an entirely different face on matters."

Mr. Joseph Baxendell, Southport, England, says: "I received the last number of the STANDARD late in the month, and read the Rev. H. G. Wood's paper with much interest, but it is based on one of Col. Clarke's equatorial diameters of the earth, and I doubt whether that is altogether safe ground to go upon, and especially as the ellipticity of the earth's figure indicated by Mr. Wood's results will not, I think, be generally received by astronomers. However, I must examine the matter more carefully before I express a decided opinion." In reply Mr. Wood says: "I think Mr. Baxendell cannot have observed that the results of my theory do not show a difference in the polar diameter of more than one hundred feet from that received by astronomers."

J. L. Dampier, of London, Ontario, after a eulogy upon Cromwell, the "St. George of his age," writes with regard to the identity question: "If we could bring to light the wondrous chain of events linked in the onward march of Ephraim and Manasseh—if we could see them mixed up with the different nations, making their way with the rest of the tribes through Europe, amongst the armed hordes of those times (Dan has left traces of his path such as the Danæ—Dan-ube, Danes—Denmark), tracing them down to their serried ranks on the field of Hastings, opposed, unknown to themselves, to their brother Benjamites—afterwards forming the choicest part of the chivalry of Europe, striving to regain Jerusalem (their native city) from the hands of the Saracens—then on, on, on, through many scenes of war and peace, guided by an unerring hand, down to the union with Scotia; then to the times of Cromwell, when was to be fulfilled the blessing on the head of Manasseh, 'as a great and a separate nation.' Then the Manassite band, leaping ashore on

that barren rock—the corner-stone of a nation—no doubt singing one of their songs of old, grandly guided by the hand of Jehovah to the promised land in safety. Thus God has borne Manasseh, as on the wings of a great eagle, into the promised land of the west. Surely there is strong enough evidence given in the case of the 'The World' against 'Anglo-Israel,' to give a full and decisive verdict for the defendants."

Mr. Theo. Gribi, of Elgin, writes: "In regard to 'The Ballard Theory of Pyramid Solution,' my expression concerning it, in one of my previous letters, was somewhat hasty and premature. I had not read Mr. Ballard's book, and the expression I used should not have been made on so superficial a notice of it as appeared in number five of the Magazine."

J. M. Durkee, referring to his paper "A Voice from the Pillar," writes: "All truth must be brought out and established before the world. 'There is a vein for the silver and the gold;' it is not for man to enjoy unless he digs for it."

At the meeting of the New York and New Jersey Auxilliary Society, on the 12th ult., Lieutenant George H. Felt lectured on "Measures as used by the Ancients." Mr. Frank H. Norton, foreign editor of *The Telegram*, says: "I had the pleasure of attending the last meeting of our section of the Institute, and of listening to the extremely interesting and important paper of Lieut. Felt on the 'Canons of Human Proportion,' a subject to which I have, incidentally, given some attention. My interest in the Pyramid question lies wholly in the direction of its astronomical reference."

Mr. J. N. Wing, secretary of the New York and New Jersey Branch Society, writes with regard to the same subject: "The meeting was a most interesting one. Though I am not a mathematician, I was greatly interested in Mr. Felt's geometric drawings. The engineers present seemed to have heard something entirely new in his discourse. One of his statements, that seven feet and seven inches are measures found in nature, and are esoteric, is hard for me to grasp; yet none of the professional gentlemen present that night could gainsay one word of his utterances. Mr. Felt is anxious to meet a body of engineers and mathematicians and lay before them his, so to speak, discoveries in the science of mathematics. There will be a meeting soon of the Liberal Club, embracing a membership of some two or three hundred men of advanced thought. Mr. Felt is to lecture before the club on his subject relative to measures, and says he will *prove* the *origin* of the *inch*. Just now I have it in mind to suggest an open debate, in some large hall, on the merits and demerits of the respective systems of weights and measures."

TRANSACTIONS OF THE OHIO AUXILIARY SOCIETY OF THE INTERNATIONAL INSTITUTE.

February 27, 1884.

Much interest in the proposed Pyramid expedition was elicited by the reading of a number of enthusiastic letters on the subject. Professor Smyth, in his letter, suggests the propriety of inviting the Russians and Germans to be represented in case the French and English have a delegate, but thinks it better for the expedition to be strictly American. The Professor, in another letter, expresses himself as being surprised at seeing his own portrait in the last magazine, together with that of Mr. John Taylor.

Lieutenant C. A. L. Totten, U. S. A., sent a paper on "Manufacture and Proportioning of Weights and Measures," to be read at a future meeting, and suggests Jacob M. Clark, C. E., of New York, as the proper person to rewrite John Taylor's book, 'The Great Pyramid and Who Built It,' the importance of which work has long been felt.

A paper from Professor Edwin R. Graham, of Missouri, criticising the system of weights and measures presented the Society some time since by Professor N. B. Wood, was listened to with much interest.

Mr. E. C. Frisbee, the Hartford druggist who recently attacked the French system in convention and met the defeat in his resolution only through courteously postponing the vote, had a letter among those read, saying that he should demand the publication of his remarks in the proceedings of the convention.

Mr. A. London Snowden, superintendent of the United States mint at Philadelphia, in a letter to Mr. Armstrong, of the *Plain Dealer*, writes as follows: "I refer to your paper of the date named, when it says that the new five-cent piece coined 'by order of the Secretary of the Treasury is of 5 gramme weight, 21 millimeters in diameter,' and adds 'that there is no law for its issue; that the law says 67 16-100 grains, etc.' The weight of this coin as established by the act of May 16th, 1866, which has not been changed by any subsequent legislation, is 77 16-100 grains, which is 5 grammes, so that it does not seem very important whether in speaking of the coin we indicate the number of grains or grammes of alloy contained therein, provided the grains and grammes express the same weight."

The use of 67 16-100 grains instead of 77 16-100 grains was a typographical error. What the Society objects to is the use of the term gramme instead of grain, and thus engrafting the metric term on our system of coinage.

A letter from H. L. Messervey elicited interesting discussion on the subject of races, which was participated in principally by Drs. Newcomer and Redfield. Other letters were read from Rev. James French and Charles Casey, C. E., of Ireland.

The members elected were:

Dr. G. W. Copeland,

George V. Watson,

J. K. Hornish,

Boston, Massachusetts.

New York.

Denver, Colorado.

Meeting adjourned for two weeks.

March 12, 1884.

An extract from the New York *Tribune* proves that the metric advocates are making vigorous efforts to oppose the work of the International Institute. The writer says:

"Professor Piazzi Smyth, Astronomer-Royal of Scotland and author of a very strange book entitled 'Our Inheritance in the Great Pyramid,' has written to this country suggesting the propriety of including Russian and German scientists in the projected Pyramid

expedition, provided England and France are represented, though he would prefer that the expedition should be strictly American. Inasmuch as Mr. Petrie's Pyramid measurements at Ghizeh appear to leave no room for further work of that kind, being laboriously exact and exhaustive; and inasmuch as the result of Mr. Petrie's measurements is to upset all, or nearly all, the peculiar theories of Professor Piazzi Smyth in regard to the significance and uses of the Great Pyramid, it is perhaps in order to inquire what special good is likely to result from the proposed expedition. The relation between the Pyramid and the 'Anglo-Saxon metric standard' seems already disproved, and the astronomical hypotheses of the Scotch Astronomer-Royal had fared no better in the hands of an unbiased measurer. In short, a natural termination of pyramidal fantasies appears to have arrived."

This slip was sent to the society by Mr. W. H. Searles, with the following comments: "The article shows that the conservative prejudice of the Royal Society is not without adherents on this side of the Atlantic. It might be well to let the *Tribune* have the advantage of the international standard."

Mr. Latimer stated that Professor Barnard, of Columbia College, a staunch adherent to the metric system, and president of a society for its introduction in this country, was a contributor to the columns of the *Tribune*, and that the article was probably inspired by animus to the International Institute. He said that he had recently met several Columbia College students, and that they had asserted that they knew nothing of the rival system, as they had been taught the metric exclusively. A letter from a correspondent in New York made a similar statement. Professor N. B. Wood said that many were devoted to the metric system, apparently for the reason that they considered it more scientific, but could give no well grounded reasons for their preference. Professor Wood is making a set of weights for the Society, having the Anglo-Saxon units adapted to a decimal scale.

A report of the Connecticut Pharmaceutical Association gave the discussion on the resolution of Mr. E. P. Frisbee: "Resolved, that the adoption of the metric system would be detrimental to our best interests as pharmacists and business men." Though the resolution was lost by a rising vote of 9 to 13, it occasioned an animated debate and will doubtless bear fruit in the future. Mr. Frisbee stated that only one machine shop employed the metric system, and that had been a failure. Mr. Gessner thought that pharmacy need not be governed by machine shops, and called attention to the variations in av. oz., tr. oz., apoth. oz., which were avoided in the new system. He disliked the idea of putting themselves on record against an improvement. In the meeting last evening Professor Wood confuted Mr. Gessner's remarks on this subject, as he said that pharmacy did not employ the av. oz., that therefore the objection was futile. Mr. Bond inquired what machine shop had employed and abandoned the metric system. Mr. Latimer replied that it had been used in the celebrated works of William Sellers & Co., and after a trial of about twenty years branded as unworthy of adoption. Mr. Sellers pronounced it as inconvenient, cumbersome and requiring more figures to accomplish the same work. He says that it is not capable of mental solutions with correctness in any ratio in comparison with our system of *inches*, nor is it equally capable of subdivision to the average workman.

A letter from Rev. E. P. Ingersoll, of Rosevale, Kansas, attacked Dr. Redfield's supposition that Joseph was the architect of the Great Pyramid and the first great master mason.

Dr. Redfield replied and gave some thoughtful reasons for his opinion. A discussion followed which was participated in generally.

Letters were also read from J. K. Hornish, of Denver; J. N. Wing, New York; Cockburn Muir, Scotland; Thomas Holland, London, England; Lewis Biden and others.

The following persons were elected members:

Charles T. Seymour,	New York City.
George Kellogg,	New York City.

Alex. Gibson,
George M. Cox,
William E. Hingston,

Norwalk, Connecticut.
Chatham, Ontario.
Buffalo, New York.

The meeting adjourned for two weeks.

March 26th, 1844.

An unusually large audience assembled in the hall of the Society. The Novelty Iron Works Glee Club, at intervals during the evening, sang appropriate songs. A letter on pyramidal free masonry, from Rev. E. P. Ingersoll, of Rosevale, Kansas, was read by the secretary. Mr. Ingersoll has been a freemason for more than fifty years. He does not believe that the teachings of free masonry benefit mankind either morally or intellectually, and repudiates the ideal that the Great Pyramid was built by freemasons, and that they held its secrets. Though his letter was received with attention, the conclusions of Mr. Ingersoll were not accepted by a majority of the members present.

The president read an extract from an article on "The Metrology of the Great Pyramid," by President Barnard, of Columbia College. Dr. Barnard speaks with scorn of the Pyramid faith and the disciples of the Pyramid religion. He says: "Of the pretension of the Pyramid theory, that in the longitudinal dimensions of its passages we have a record (prophetic it must have been) of the most important epochs of human history, it is difficult to speak seriously. If we were dealing with periods of which authentic annals have come down to us, as of the capture of Constantinople, or of the Declaration of American Independence, it would be easy to subject this pretension to an unimpeachable test. But of the three dates which are specified as distinctly indicated in this monument, viz.: the dispersion of mankind at Babel, the exodus of the Israelites from Egypt and the birth of Christ, to which we may add a fourth—the date of the foundation of the Pyramid itself—there is not one which is not contested." This paper will be discussed at a subsequent meeting.

A letter from Mr. S. G. Arnold, of Washington, in discussing the disagreements with reference to the length of the base side of the Pyramid, commends the careful work of Mr. Petrie, and acknowledges the benefit we derive from his measurements.

F. H. Hess, of Fort Dodge, Iowa, writes with reference to the correction of the calendar. He says that the fifty years' period seems more natural and rational than our present leap year period, which destroys the cycle of seven years corresponding to the fundamental division of time into the week of seven days, the mystic period of creation. He suggests that the twelve months of the year should be divided into full weeks, by giving to March, June and September thirty-five days each, to December thirty-six days, and to all the others twenty-eight days each, we should have the further advantage of having every month of the year begin with the same day as the month beginning the year, and the first day of the year and of each month would rotate through the week in regular succession for $7 \times 7 = 49$ years, after which a year of jubilee of three hundred and seventy-seven days, in which each month would have one more day than in the common year.

The president read a paper from S. H. Reeve, S. Eliot, Me., and illustrated it by black-board diagrams.

F. H. Hess, Fort Dodge, Iowa, and A. C. Oakley, New York, were elected members. Meeting adjourned for two weeks.

April 9, 1844.

The Secretary's report showed that the receipts of the Institute from membership dues and donations for the months of January, February and March were \$324.05.

A letter from Robert C. Hine, New York, inclosed a clipping from the *Evening Telegram* headed "To Study the Pyramids—The Proposed Expedition from This Country—Its Object." The writer ridicules the idea of an American scientific expedition for that purpose, and says: "Mark Twain's story of the frogs and other animals who went on

scientific expedition in which they met the steam locomotive and expressed their various views as to what it was, is to be surpassed by an expedition to Egypt by a number of members of the International Institute for Preserving and Perfecting Weights and Measures for the purpose of examining the pyramids." A professor of Columbia College, a firm believer in the French metric system, said to a *Telegram* reporter: "I think if the expedition is made, the money furnished to defray the expenses will simply be lost. AL though I believe the object of the expedition is for the purpose of discovering the weights and measures of the ancient Egyptians, I cannot imagine of what use such information will be. The great system and the one coming into use all the time is the metric. President Barnard, of Columbia College, President of the Metric System Society, is writing on the Pyramid of Ghizeh, and will shortly make his work public."

The fact that the faculty of Columbia College and the advocates of the metric system are now employing the columns of the New York press to ridicule the objects of the International Institute proves that the adversary of whom they once spoke with contempt and unworthy of attention has so developed in power as to arouse them to hostile action and to demand the earnest efforts of one of their most able advocates to oppose his claims. The work of President Barnard on the Pyramid of Ghizeh will be one of the best advertisements of the strength of the International Institute, and as such will be received with welcome by the members.

The chairman, referring to Dr. Barnard's criticism upon the Pyramid measures, presented the following for the consideration of measurers: The coffer length in the Great Pyramid is 90 inches, the height 41.25 and the depth 34.37 inches; deduct the depth from the height and you have the bottom thickness equal to twice the depth divided by 10, 6.875 inches. The Pyramid is in latitude 30 degrees north. Take the circle of this latitude 360 degrees in minutes equal to 21,600; the diameter through this latitude is 6,875 miles; the radius is 3,437.7 miles. Mr. Wood has shown the close approximation, if not exactitude, of a minute of arc in this latitude to one mile, 5,280 feet. In this Mr. Beswick agrees and has also shown the earth relations thereto. 360 degrees multiplied by 60 minutes equals 21,600 minutes; 21,600 multiplied by 5,280 equals 114,048,000 feet. One ten millionth of the radius of this circle (18,151,284 feet) is 18.151, feet or 1 foot 9.78 inches, the common Jewish cubit as Mr. Wood has shown. We have therefore every reason to believe that the measures of the coffer agree with the measures of the earth in latitude 30 degrees circle, and that all agree with the British measures. Here we have the lotus flower of the Pyramid.

One lady suggested that the coffer was the symbol of the resurrection. This looks like a resurrection of our measures as related to the earth. Dr. Redfield said that man was related to the microcosm and that it would seem fitting that he should have been laid in a coffer of such relations as that to the earth.

Professor Piazzi Smyth writes: "Let me applaud your idea that the European countries which have adopted the metre are those which were conquered by Napoleon Bonaparte and those which have not adopted it are those which Napoleon tried to conquer but could not, God overruling him."

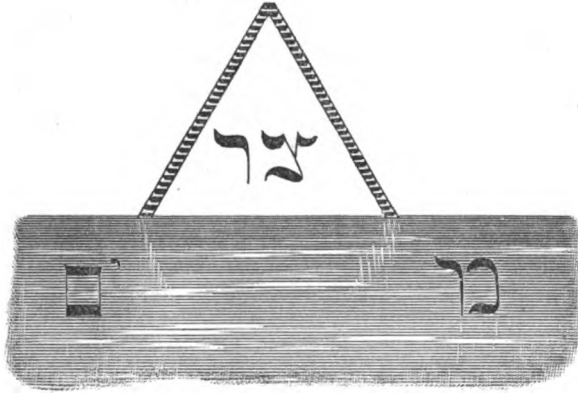
A paper on "The History of the Great Pyramid," by Rev. Jesse H. Jones, traced in a lucid and interesting manner the course of pyramid discoveries and the development of doctrine.

Edwin Wilmshurst, of Retford, England, sent the Society a work from his pen, 'Glimpses of Our Celtic Ancestors,' which will be reviewed in the INTERNATIONAL STANDARD. He sent also a branch of yew from the grave of John Taylor.

An article by J. Ralston Skinner, in *Our Rest*, was read by the President. Mr. Skinner says: "There is coherent, continuous and systematic language contained in, and concealed under the Hebrew text of the Pentateuch, by which the Great Pyramid is described as to the system of its measures, and other words of application. This language proves

this part of the Bible, from the very first word of Genesis. Strange to say, it is based on two arithmetical ratios, without which it cannot be read. These ratios are 6561 to 20612 and 113 to 355. They are ratios expressive of what we call Greek π , and are founded on the grammatical relation of diameter to circumference of the circle.

The part which the land of Egypt is made to take in the divine economy of the Bible is essential, because '*Out of Egypt have I called my Son.*' The name of this land of itself contains the symbol of its essential importance in a picture; and this is its representation. Sketch a river of *water*, with a *rock* pyramid on its bank. The Hebrew word for *water* is *mim*, and that for the pyramid rock is *tsr*. Place these letters as shown in the sketch.



Read the word *water* and *rock* combined, and we have מצרים. Refer to your Hebrew Bible and you will see that this is the word used for *Egypt* throughout in the text. The signification is the '*Rock at, or out of Water,*' or the '*Water out of the Rock,*' and the representation is made by Moses at Mount Horeb, in this determined shape. Under the figure of *Mount Sinai*, this is made to become the veritable mountain, on which Jehovah descended in *fire*. Jehovah sanctified this מצרים, or *Pyramid of the Waters*, and it is the substance of the Mosaic Books, out of which substance sprung the divine laws and ordinances. This pyramid was called '*The Ancient of Days.*' "

A letter from Professor Leconte Stevens, of Packer Collegiate Institute, asked for information respecting the organization and aims of the Institute. Mr. Stevens' letter and Mr. Latimer's reply were read by the Secretary.

Some specimens of Egyptian mummies were recently received by Mr. Edwin Cowles from Dr. Pomeroy, American Consul at Cairo. They are now on exhibition at the rooms of the Society. One remarkably well shaped head has evidently been covered with gold leaf, and is apparently the remains of a person of high rank.

Horace Smith's "*Address to an Egyptian Mummy*" was read by the Secretary.

A letter from J. K. Hornish, of Denver, Colorado, was also read.

The members elected were :

W. W. Armstrong,
Mrs. H. E. Godfrey
F. A. Kempt,
Alonzo Kasson,
John F. Shaw,
F. A. R. Winter,

Cleveland, Ohio.
Grass Valley, California.
Hartville, Missouri.
Elk Point, Dakota Territory.
Toronto, Ontario.
Georgetown, British Guiana.

In consequence of the large number of letters and papers on hand a special meeting was appointed for the 16th inst.

MONTHLY RECEIPTS FROM SUBSCRIBERS TO THE
INTERNATIONAL STANDARD.

INTERNATIONAL INSTITUTE, NOVEMBER, 1883.

[THE SOCIETY'S YEAR BEGINS NOVEMBER 8TH.]

NOVEMBER.

W. K. McAllister, Garden City, L. I.....	\$ 2 00
Amory Coffin, Phoenixville, Pa.....	2 00
Professor E. R. Graham, Fairville, Mo.....	2 00
J. Nehab, Ph. D., Garden City.....	2 00
Ole Olsen, Elgin, Ill.....	2 00
James H. Moore, New York.....	2 00
J. L. Dampier, London, Ontario.....	4 00
R. P. Lowe, Washington, D. C.....	2 00
Capt. R. Kelso Carter, Chester, Pa.....	2 00
W. J. Spicer, Montreal, Canada.....	5 00
Thomas E. Douglas, Mansfield, O.....	2 00
Hon. John B. Jervis, Rome, N. Y.....	2 00
F. A. Von Gassy, Effingham, Ill.....	2 00
W. A. Sweet, Syracuse, N. Y.....	4 00
Gen. C. B. Norton, Boston, Mass.....	2 00
Edwin Wilmschurst, Retford, England.....	2 44
R. B. Lockwood, Binghampton, N. Y.....	2 00
Theo. Faber, Brooklyn, N. Y.....	2 00
Rev. E. P. Adams, Dunkirk, N. Y.....	2 00
Rev. J. F. Fahs, Akron, O.....	2 00
Sidney J. Sanford, Barrie, Ontario.....	2 00
W. C. J. King, Barrie, Ontario.....	2 00
R. W. Crompton, Barrie, Ontario.....	2 00
T. G. Armstrong, Jamestown, N. Y.....	5 00
P. Bowen, Cochranon, Pa.....	2 00
Rev. M. L. Streater, Helena, Montana.....	2 00
Spencer H. Smith, New York.....	2 00
Joseph T. Moulton, Chicago, Ill.....	2 00
Wm. Rundquist, Elgin, Ill.....	2 00
Rev. Chas. Hardon, Contoocooke, N. H.....	2 00
John Bliss, New York.....	2 00
W. W. Evans, C. E., New Rochelle, N. Y.....	2 00
Dr. Porter W. Taylor, Cleveland.....	2 00
J. A. Bidwell, Cleveland.....	4 00
Justin Holland, Cleveland.....	2 00
James S. Lawrence, Cleveland.....	4 00
Geo. H. Kelley, Cleveland.....	2 00
P. Collopy, Cleveland.....	2 00
James McIntyre, Cleveland.....	2 00

R. Gurley, Cleveland.....	2 00
James F. Clark, Cleveland.....	2 00
Wm. H. Searles, Jersey Shore, Pa.....	2 00
J. W. Alsop, Galion, O.....	2 00
E. Collopy, Youngstown, O.....	2 00
Wanzer Holcomb, Ravenna, O.....	2 00

 \$104 44

DECEMBER.

O. B. Main, Cleveland.....	2 00
Joseph Hugill, Akron, O.....	2 00
Rev. R. E. McDaniel, Vandalia, Ill.....	2 00
Mrs. Moses Hill, Kalamazoo, Mich.....	22 00
Joseph W. Frey, Los Angeles, Cal.....	5 00
S. H. Reeve, South Elliot, Me.....	2 00
Arthur Bates, Meadville, Pa.....	2 00
Charles Casey, Carlow, Ireland.....	4 75
Victor H. Ernst, Jersey City, N. J.....	2 00
J. H. Drew, Norwalk, Ohio.....	2 00
Lewis Biden, Portsea, England.....	2 19
Wm. Hart, Elgin, Ill.....	2 00
Mrs. J. R. Smith, New York.....	2 00
Michael Keating, Oil City, Pa.....	2 00
Joshua Douglas, Meadville, Pa.....	4 00
Dr. J. V. Reynolds, Meadville, Pa.....	3 00

 60 94

JANUARY, 1884.

G. L. Heisel, Cleveland.....	2 00
Rev. M. Murphy, Cleveland.....	4 00
C. T. Heisel, Cleveland.....	2 00
W. E. Bond, Cleveland.....	2 00
D. W. Gage, Cleveland.....	2 00
R. H. Lewis, Cleveland.....	10 00
Miss Rosa Crampfort, Cleveland.....	2 00
L. W. Perry, Cleveland.....	2 00
A. G. Bryan, Galion, O.....	2 00
W. C. Durgin, Galion, O.....	2 00
James Mackey, Youngstown, O.....	2 00
John N. Poage, Cincinnati, O.....	2 00
R. W. Burnet, Cincinnati, O.....	5 00
Geo. M. Howells, Flushing, N. Y.....	1 00
John Jay Laman, C. E., Cleveland.....	2 00
Professor C. Piazzi Smyth, Edinburgh, Scotland.....	6 09
H. A. Powers, Cincinnati, O.....	2 00
P. Govay, C. E., Velay, Indiana.....	2 00
John N. Poage, Cincinnati, O.....	10 00
C. V. Kasson, Detroit, Mich.....	2 00
Geo. Staples, McKean, Pa.....	2 00
Joseph Churchyard, Buffalo, N. Y.....	10 00
J. J. Williams, C. E., Jackson, Tenn.....	2 00
John G. Godwin, London, England.....	2 44
Rev. J. A. Upjohn, Neenah, Wis.....	2 00
Cook Talcott, New York.....	2 00
Jesse Fosdick, Salamanca, N. Y.....	2 00

Monthly Receipts.

S. G. Arnold, Washington, D. C.....	2 00
George Boyce, Sharon, Pa.....	2 00
A. S. Dunbar, Meadville, Pa.....	2 00
Mrs. W. A. Plumptre, Ewelme, Wallingford, England.....	2 43
J. H. Worth, West Field, Retford, England.....	2 44
James McAllister, Sinclairville, N. Y.....	2 00
Samuel McElroy, Brooklyn, N. Y.....	2 00
D. W. Gage, Cleveland.....	2 00
Rev. Alex. S. Falls, Amherstberg, Ontario.....	2 00
Professor Samuel Bates, Meadville, Pa.....	2 00
L. Sharpe, Providence, R. I.....	4 00
J. Ralston Skinner, Cincinnati, O.....	25 00
W. C. Whittemore, Chicago, Ill.....	2 00
W. A. Haven, Buffalo, N. Y.....	2 00
Sale of Photo Isis.....	50
One Copy Magazine.....	35
Theo. Gribi, Elgin, Ill.....	10 00

151 25

FEBRUARY, 1884.

J. M. Durkee, Pittsfield, Mass.....	2 00
Rev. Joseph A. Seiss, D. D., Philadelphia, Pa.....	5 00
James G. Johnson, Salamanca, N. Y.....	2 00
W. K. McAllister, Garden City, L. I.....	2 00
R. D. McCreery, Oil City, Pa.....	2 00
Mrs. Rebecca Hazard, Kirkwood, Mo.....	2 00
E. Jane Copeland, Bryantville, Mass.....	2 00
Jacob Klein, St. Louis, Mo.....	4 00
Wm. Ernstein, St. Louis, Mo.....	2 00
Fred. Perkins, San Francisco, Cal.....	2 00
H. A. Coffeen, Danville, Ill.....	2 00
Mrs. Jonas Minturn, Athlone, Cal.....	2 00
Dr. G. W. Copeland, Boston, Mass.....	2 00
H. W. Oswald, San Francisco, Cal.....	4 00
Geo. V. Watson, New York.....	4 00
J. K. Hornish, Denver, Col.....	2 00
Mrs. Gustav Lindenthal, Sewickley, Pa.....	2 00
Dr. S. G. Armstrong, Berrien Springs, Mich.....	2 00
G. W. Crosse, Cleveland.....	4 30
A. Mordecai, Cleveland.....	2 00
G. A. Hyde, Cleveland.....	2 00
A. C. Getchell, Cleveland.....	2 00
L. Austin, Cleveland.....	2 00
T. B. Bassett, Cleveland.....	2 00
W. J. Morgan, Cleveland.....	2 00
Wm. Bowler, Cleveland.....	2 00
Miss M. A. Quirk, Cleveland.....	2 00
R. D. Noble, Cleveland.....	2 00
Geo. Burwell, Cleveland.....	2 00
Hugh Ross, Galion, O.....	2 00
Fred. C. Weir, Cincinnati, O.....	2 00
O. W. Kyle, Youngstown, O.....	2 00

75 30

MARCH, 1884.		
Mrs. Henry Hibben, Cincinnati.....	2 00	
James H. Emminger, Mansfield, O.....	2 00	
J. H. Dow, Cleveland.....	2 00	
H. S. Julier, Cleveland.....	2 00	
John H. Dwyne, Cleveland.....	2 00	
Charles Latimer, Cleveland.....	2 62	
Charles Heiss, Cleveland.....	2 00	
Robert Potter, Cleveland.....	2 00	
A. G. Smith, Cleveland.....	2 00	
W. W. Andrews, Cleveland.....	2 00	
J. E. Turk, Cleveland.....	2 00	
H. L. Church, Cleveland.....	4 00	
H. H. Savage, Cleveland.....	2 00	
Frank Murgatroyd, Cleveland.....	2 00	
W. W. Williams, Cleveland.....	2 00	
Charles Kellogg, Athens, Pa.....	2 00	
John C. Wilson, Mitchell Square, Ontario.....	2 00	
B. A. Mitchell, Philadelphia, Pa.....	2 00	
Rev. James French, Philadelphia, Pa.....	2 00	
Alex. S. Gibson, Norwalk, Conn.....	5 00	
Geo. Kellogg, New York.....	3 16	
Charles T. Seymour, New York.....	2 00	
Rev. J. H. Hopkins, Williamsport, Pa.....	2 00	
Geo. M. Cox, Chatham, Ontario.....	2 00	
Alice S. Emerson, Buffalo, N. Y.....	2 00	
Wm. E. Hingston, Buffalo, N. Y.....	2 00	
Mrs. A. E. Gates, Chicago, Ill.....	2 00	
Joseph Faxendell, Birkdale, Southport, England.....	2 03	
J. P. Reed, Sharon, Pa.....	2 00	
F. M. Robertson, M. D., Charleston, S. C.....	2 00	
F. Hess, Fort Dodge, Iowa.....	4 99	
A. C. Oakley, New York.....	2 25	
Joseph D. Weeks, Pittsburgh, Pa.....	2 00	
George M. Atwater, Brightwood, Mass.....	2 00	
J. N. Wing, New York.....	2 00	
Rey. Joseph Wild, D. D., Toronto, Ontario.....	2 00	
Thomas Holland, London, England.....	2 44	
R. Ballard, Rockhampton, Australia.....	4 00	
Miss Lucy E. Dow, Hampton, N. H.....	2 00	
APRIL, 1884.		90 49
Alonzo Kasson, Elk Point, D. T.....	2 00	
George V. Watson, New York.....	1 00	
F. A. Kempt, Hartville, Mo.....	2 00	
F. A. R. Winter, Georgetown, British Guiana.....	2 00	
Mrs. H. E. Godfrey, Grass Valley, Cal.....	2 00	
E. D. Echols, Sharon, Pa.....	2 00	
Edward C. Frisbee, Hartford, Conn.....	2 00	
F. R. Kimball, Salem, Mass.....	2 00	
John F. Shaw, Toronto, Ontario.....	4 00	
H. M. Clafin, Cleveland.....	2 00	
Col. M. B. Ewing, Cincinnati.....	2 00	
		23 00
Total receipts from November 8, 1883, to April 14, 1884.....		\$505 42

EDITORIAL NOTES.

We are now prepared to furnish bound volumes of the Magazine. The members and others will do well to take advantage of the opportunity to purchase the volume for 1883, which can be sent, postage free, for \$3.00.

In the next number of the Magazine we expect to commence the publication of a tabulated list of all the measures made of the Great Pyramid, so that all readers and students can have them on hand for reference and calculation. Mr. Petrie's late measures will be added to the list.

Friends, help us in our work. You know the object is worthy. You know that it is unselfish. You know that it is not a money-making scheme. You know that it is a work for our race. Give us a helping hand and heart in this work for a noble and God-like purpose.

REVIEWS.

GLIMPSES OF OUR CELTIC ANCESTORS, WITH ENGRAVING OF THE DEDICATION STONE OF THE TEMPLE OF NEPTUNE AND MINERVA, DISCOVERED AT CHICHESTER, SUSSEX. By E. Wilmhurst, Retford, Notts, England.

We regret that this interesting pamphlet arrived as we were closing this issue of the Magazine. We will give extracts in a subsequent number.

THE STUDENT'S JOURNAL.

This excellent phonographic journal is published by Andrew J. Graham, New York, of The Reporters' List. Hyphenized

exercises and phonographic reading exercises are invaluable to the student of phonography, while the departments devoted to hygiene, philology, biography, etc., are interesting and instructive to the general reader.

FACTS AND DATES, OR THE LEADING EVENTS IN SACRED AND PROFANE HISTORY AND THE PRINCIPAL FACTS IN THE VARIOUS PHYSICAL SCIENCES, THE MEMORY BEING AIDED THROUGHOUT BY A SIMPLE AND NATURAL METHOD. By the Rev Alex Mackay, LL. D., F. R. G. S.

The first division of the book contains scientific, the second, historical facts.

In the system of mnemonics adopted, the consonants of the English alphabet are employed to express numbers, the five vowels being disregarded, and the half vowels (*w, y*) being used to denote the cipher (0) as also the letter *x*.

This leaves 18 consonants to express the 9 numerals. The first two (*b, c*) denote 1; the second pair (*d, f*) 2, and so on.

$$\begin{array}{l|l|l} b, c=1 & j, k, s=4 & p, q, z=7 \\ d, f=2 & l & r =8 \\ g, h=3 & m, n =6 & t, v =9 \\ & w, x, y=0 & \end{array}$$

To fix in the memory any fact in science, or any event in history, a short sentence bearing on the fact or event is constructed in such a way that the *first consonants of the several words* express the figures or numerals in the number to be remembered.

Example.—The distance of the earth from the sun is 92 (millions of miles, understood), and the mnemonic sentence, intended to yield up this number, is “the world’s *true distance*.” Here the first three consonants are *w, t, d*, which denote 0, 9, 2, or simply 92, as the cipher on the *left* has no value. Ex. 2.—Date of the deluge, according to the Septuagint, B. C. 3216; the mnemonic sentence is: “a *general deluge covers the mountains*.” Here the four first consonants are *g, d, c, m*, which denote 3, 2, 1, 6, or 3216. In each example the *article* is disregarded.

INQUIRERS' CLUB.

What is the Pyramid inch?—What relation has the British inch to the earth's diameter?—What is the possible error in the polar diameter?—What is the possible error in the metre of the French system? C.

BROOKLYN, N. Y., April 4, 1884.

Query?—Will you be kind enough to let me have answers, as brief as you think necessary, to the following questions?

1. When was the "International Society for Preserving Weights and Measures" organized?
2. Is there but one office of the Society in America, or have you various branches? If so, where are these branches, and what American scientific men are most prominently the advocates of the measures for which the Society is organized?
3. What branches has the Society in Europe, and who are the scientific men there as its most prominent representatives?
4. Do you advocate the preservation of the various English weights and measures now in use, such as the ounces and pounds, troy and avoirdupois? If so, what European societies outside of England are committed to your support? If not, what do you propose to substitute?
5. If a substitute has been agreed upon, what guarantees of support have you in America?

6. If Piazzi Smyth's "Pyramid inch" and "sacred cubit" are to be adopted, is there any reason to hope for a change to these units by legislative action?

7. If the Society is committed to the preservation of existing weights and measures, such as the ounces of $437\frac{1}{4}$ and 480 grains respectively, the yard of 36 inches and rod of $5\frac{1}{4}$ yards, the gallons of 231 and $277\frac{1}{4}$ cubic inches respectively, the tons of 2,000 and 2,240 pounds respectively, the quarts of $57\frac{1}{4}$ and $67\frac{1}{4}$ cubic inches respectively, is it thought that such diversity is desirable, or is it that the immediate inconveniences attendant upon change overbalance the future advantages to be derived from abolishing multiplicity of units the same in name?

Please not understand me to be asking these questions in the spirit of an advocate on either side of the controversy. I will frankly say that as a teacher of physical science I have for many years past been in the habit of using the metric system because of its simplicity and definiteness. I have read Piazzi Smyth's book, 'Our Inheritance,' etc., as well as President Barnard's recent criticism of it in the School of Mines Quarterly, and I wish simply information as to the objects to be attained by your Society. I have not thus far seen any copies of the journal of your Society.

Perhaps some of my questions may be already answered in print. If any of them are not, and if you will return them with your answers, I shall be much obliged.

W. LECONTE STEVENS.

Answer.—The International Society for Preserving and Perfecting Weights and Measures was organized on the 8th day of November, 1879, at Boston, Mass. The principal office of the Society is in Cleveland; there is a secretary located in Boston. The Boston Society is small, and the publications are all issued here. Meetings have been held here every two weeks for the last four years and a half. There has been a society formed in New York. Clark Fisher, C. E., is acting president of it, and Mr. J. N. Wing, of Scribner and Wellford, Astor Place, is secretary. They meet

every two weeks. There are no branch societies in Europe yet. We have some six hundred members. The societies are not numerous; the organization is new and the means thus far have not been large enough to have societies in different parts of the world. It was contemplated, however, to accomplish this.

We advocate the preservation of the units of the Anglo-Saxon weights and measures. We do not advocate the preservation of all the cumbrous tables. We believe in the inch, foot, yard, mile, grain, ounce, pound, &c. We would have multiples of the units so that there could be no possible misunderstanding. We would not oppose, and we are working upon, a decimalization of our system, but we would not be held down to decimalization, but would also have duodecimals. Our first work is to prove the value of the Anglo-Saxon system and to show that it is earth-commensurable and has a foundation of great value. We are not willing, therefore, to substitute for it the new system, which is imperfect in its relations to the earth. We do not propose, and we do not think it necessary, to adopt the sacred cubit as our standard, nor the Pyramid inch. But our researches rather go to show that the British measures are perfect as regards our inch to one particular measure, namely, of the diameter of the circle of 30 degrees latitude in which the Pyramid stands and hence to the Pyramid inch. Inasmuch as there are a great number of persons in the Society studying and trying to devise means to simplify our tables, and working on the relations of these units to measures of the earth, we believe that from these studies there will be evolved a perfection of our own system very superior to that of the French. We do not think it desirable to commit ourselves to various sized pounds, tons and gallons, but are seeking for the simplification of all these.

I am glad that you have read Piazzi Smyth's book, 'Our Inheritance in the Great Pyramid,' and I am also pleased that you read Professor Barnard's recent criticism. We might well exclaim, "O, that our enemy would write a book!" and we are very much pleased that Professor Barnard is now putting himself on paper. At first he ridiculed the theory that the Pyramid could have any weight in determining our weights and measures, but the "fanaticism" of following Piazzi Smyth has aroused his indignation, and he is obliged to put forth his herculean strength to wipe out these "cranky" people at one fell blow and put us where we belong; but he will find that we will be like Banquo's ghost—we will not down, and he will have to retract much that he has written. He shows ignorance of many things, and one of the things that he thought the least important when he adopted the French metric system and declared himself the champion of it in this country, was to investigate what was the value of that which he was going to throw away, namely, our hereditary units of weights and measures. A man of such erudition as Dr. Barnard, and of such strong religious conviction and knowledge, would have done well to have paused before he destroyed the bridges behind him; but he has done so and there he is. Let the sequel prove. We are willing to abide by the truth and stand or fall by it, and we are not at all afraid either of his criticism or that of his friends. We have a great TRUTH to promulgate, and we propose to do it. We propose to prevent our people from adopting the French system illogically and casting aside that of the origin of which they are entirely ignorant as a general rule. We hope to prevent them from having that shame which would be theirs should they throw away their own weights and measures before they know whether they are right.

I should be very glad to have you take our Magazine; it will cost you \$2.00 a year. We should be glad to have you as a member, but I see, as a metric advocate, you cannot join us, but you might be instructed by reading our publications. We have scientific men in the work, but we do not throw aside papers because they are not scientific. We hope that they are logical. Some of them are very strongly criticised, and yet many of them are from very sensible men; although many are speculative they are very suggestive. Some of them are of very great value indeed, as you will find, and I trust that you will be convinced.

CHARLES LATIMER.



WILLIAM OSBURN,

Author of the "Monumental History of Egypt," "Isis:
in Egypt," etc.

THE
INTERNATIONAL
STANDARD

A MAGAZINE

DEVOTED TO THE DISCUSSION AND DISSEMINATION OF THE WISDOM CONTAINED
IN THE

GREAT PYRAMID OF JEEZEH IN EGYPT

JULY, 1884.

ISSUED BIMONTHLY. PRICE 36 CENTS

TERMS OF SUBSCRIPTION AND MEMBERSHIP, \$2.00 PER ANNUM IN ADVANCE

The International Institute as a body is not responsible for the facts or the opinions put forth by any of the writers for this Magazine.

All in favor of advancing truths most absolute, as portrayed in the revelations of the Great Pyramid of Egypt, and of the success of the Society in preserving inviolate the Anglo-Saxon weights and measures, will kindly communicate with the President, by whom also subscriptions, donations and communications will be gratefully received.

THE INTERNATIONAL INSTITUTE

FOR PRESERVING AND PERFECTING THE ANGLO-SAXON WEIGHTS AND MEASURES

CLEVELAND: 64 EUCLID AVENUE

BOSTON: 345 TREMONT STREET

INTERNATIONAL INSTITUTE FOR PRESERVING AND PERFECTING WEIGHTS AND MEASURES.

FOUNDED NOVEMBER 8, 1879.

CHARLES LATIMER, President, Cleveland, Ohio.
J. S. F. HUDDLESTON, Vice President, Boston, Mass.
LUCIAN I. BISBEE, Secretary, Boston, Mass.
G. R. HARDY, Treasurer, Springfield, Mass.

OHIO AUXILIARY SOCIETY.

CHARLES LATIMER, President. WM. H. MCCURDY, Treasurer.
A. M. SEARLES, Vice President. G. W. CROSSETTE, Cor. Secretary.
MARY B. SANFORD, Recording Secretary.

PUBLISHING COMMITTEE.

CHARLES LATIMER, C. E. } Editors. J. H. DOW. J. W. REDFIELD, M. D.
H. C. THOMPSON, } W. W. WILLIAMS. J. A. BIDWELL.
MRS. A. M. SEARLES. MARY B. SANFORD.

COMMITTEE ON STANDARD TIME.

REV. H. G. WOOD, Chairman of Committee, Sharon, Pennsylvania.
PROF. PIAZZI SMYTH, Astronomer Royal for Scotland, F. R. A. S., F. R. S. E., etc.,
Edinburgh.
M. L'ABBE F. MOIGNO, Canon of St. Denis, Paris, France, editor of *Cosmos Les Mondes*,
and author of "The Splendors of the Faith."
SANDFORD FLEMING, C. M. G., M. Inst. C. E., F. G. S., F. R. G. S., Ottawa, Canada.
WILLIAM H. SEARLES, C. E., Elyria, O.
JACOB M. CLARK, M. Am. Soc. C. E., New York.
PROF. STOCKWELL, Astronomer, Cleveland, Ohio.
CHARLES LATIMER, C. E., Cleveland, Ohio.

WILLIAM W. WILLIAMS, PRINTER,
145 and 147 St. Clair Street, Cleveland, Ohio.

THE INTERNATIONAL STANDARD.

JULY, 1884.

THE HISTORY OF THE GREAT PYRAMID.

III.

In 842 A. D. Al Mamoun died at Bagdad, and for many years the Great Pyramid stood under the cloudless sky, and amid the desert sands of Egypt, just as it had stood for so many ages before, undisturbed by the hand of man—its white slopes, in all the beauty of perfect geometric form, gleaming daily in the noontide sun. The wild, barbarous peoples which writhed or rotted in the valley of the Nile had by and by known and could know nothing concerning it. And could they, or those as regardless of it as they, have ruled in that land till now, well would it have been for the pyramids, and for whatever of message they bore to the generations of men which were to come after. But the deluge period came at length to this mightiest work of man, as indeed it seems ordained to come to his every work soon or late. And this is how the deluge came, so far as a record has come down to us.

A century and a half, or more, after Al Mamoun quarried out his ragged way into the Great Pyramid, and first of men in historic times made known the interior structure of the edifice, that is about the year 1000 A. D., the Caliphs of Cairo began

the systematic pillaging of all the pyramids, as suited their turn. They wished to enlarge and adorn their capital city; and it seemed to them a great deal more reasonable to take the stones with which to effect their designs from what appeared to their conceit these useless monuments of the folly of the ancients, which were only six miles away, rather than to go one hundred and twenty miles away, to the quarries where the original workmen got them. They were incapable of the slight modesty of thinking that perhaps the men who knew enough to construct such immense masses in perfect geometric forms might have uttered in their work thoughts of corresponding worth, which some generation might yet arise that would be competent to understand and interpret. So in their high conceit, at it they went, and attacked the pyramids nearest them, being the three of which the Great Pyramid is the chief. Thus it came about that for ages the pyramids were the quarries for all builders in Cairo, and so continued until not a stone was left in sight which builders could use, save only a cluster which forms the point of the second one, which, for some reason that cannot now be guessed, the despoilers left like a bunch of fruit on a topmost bough in air. Thus the pyramids came to ruins. But the night wore on, and day drew near in due time.

The morning star of modern times for the Great Pyramid arose when Professor John Greaves of Oxford, England, visited it in 1638. Clearly he was the first of moderns who had any adequate sense of what that vast edifice might be. Himself a mathematician of exceptional excellence, and having the spontaneous instinct of mathematical forms in his soul, he was the first man, apparently, in historic times who felt the real force and meaning of the Great Pyramid's geometric shape, and as the first one built, and so the one that set the type saw that the only rational theory concerning it was that it had a corresponding, that is a mathematical, origin. Certainly he was the first person mentioned in history who approached it with a scientific spirit and brought suitable instruments to measure it with. And until since Mr. John Taylor's publication of the clue to the construction of the building, no more choice measurements than his were made. But as his good work has received full

notice in a former number of this Magazine, we omit further comment. And what historic facts we mention further will be only the more important incidents, which are of distinct value in Pyramid history.

Visitors and measurers, few and of little value, came to the pyramids from time to time; but it was a hundred and twenty-five years after Professor Greaves' epoch-making visit before any thing occurred that calls for notice here. But in the year 1763, a notable Pyramid event occurred: for in that year a Captain Davison, of the British service, dug his way through from the top of the upper (*i. e.* the south) end of the grand gallery level to the space over the king's chamber, and found the lowest of the five chambers of construction. And this was of value not only because it added to our knowledge of the structure of the building, but also because it led to the discovery of the other chambers of construction with all the important knowledge they disclosed.

The next event of note was the advent of the French under Napoleon, in 1799. Save only Professor Greaves, these were the first men in historic times who approached the building in the true scientific spirit; and brought to bear upon the investigation of it that disposition for accuracy and acute examination, which are the glory of modern science and which render correct knowledge possible. They especially observed with what extraordinary accuracy the Great Pyramid is oriented, or set true to the four points of the compass. They also measured many parts with great care; but their only discovery was that of the two northern corner sockets, which they dug down to and so disclosed. This was of great importance, however, as it showed that the size of the building on the ground originally was considerably greater than moderns had known, and led the way to the discovery of the other two sockets, and the final ascertainment of the true base.

The next event of importance was the work of Signor Cavaglia, who in 1818 cleared out the descending passage from where the ascending passage branches off to the lower chamber, which until this date was unknown to moderns. On the contrary, the downward passage and chamber therefrom were all that

were known to the ancients, the whole system of rooms and passages in the upper part of the building having been carefully concealed by the builders, so that all knowledge of them was soon lost.

And now we come to one of the greatest events in Pyramid history. In 1837, Col. Howard Vyse, a man of large means from England, spent seven months and a fortune in exploring at the pyramids, not only at the Great Pyramid, but at the others also. He found and cleared out the ventilating tubes of the king's chamber. Also, starting with Captain Davison's chamber of construction over the king's chamber, he dug' out upward and discovered all the other chambers of construction, showing with what elaborate pains the builders had protected this room from the pressure of the superincumbent mass, and so showing that this room was the chief thought and care of the builders. In the upper of the four level chambers of construction, on the under side of the granite beams which form the ceiling, Col. Vyse found in the rude quarry mark of the workman who wrought the stone the name of the Egyptian monarch under whom the building was erected; and it is the same as that given by Herodotus, though it is of course in the Egyptian form, Shoufou, instead of the Greek form, Cheops. In some respects this is the most important disclosure or revelation that has been made. But in other respects his greatest discovery, and in fact the most important of all that have been made, was that of' the two casing stones *in situ*. It was from these two stones standing side by side, that the angle of the slope was derived, from which the clue to the whole geodesical problem of the building was obtained. He himself had no idea of the importance of the angle of those stones, and gave them a fair measurement only, but not a most refined measurement to the tenth of an inch as the case required. But to the measurements, such as they were, was due more than to any other one fact the subsequent discovery by Mr. John Taylor of the geometric proportion embodied in the very form of the edifice. And to this man's most memorable and precious work we now come.

Early in December, 1859, there appeared in England the most

extraordinary work which, up to that time, had ever been published concerning the Great Pyramid, it being the first attempt to explain the building upon a scientific basis which had ever been made. The work was entitled 'The Great Pyramid; Why was it Built? And who Built it?' The author was a Mr. John Taylor, till then unknown to fame, though of high esteem in the important position which he held. He was publisher to the London University, and had been for at least a quarter of a century. He was then eighty years old, and had been studying the subject thirty years. In this book was given the condensed results of his thirty years of study, namely, the clue to the whole problem of the building, with some parts of the solution.

The two fundamental propositions of Mr. Taylor were one concerning the nature, the other concerning the structure of the Great Pyramid. Concerning the nature of the building, Mr. Taylor taught that it was a strictly scientific structure, containing the elements of a system of weights and measures in terms commensurable with the earth, stated in geometric proportions. Concerning its structure he taught that it was so shaped that its height was to twice its base as the diameter of a circle is to its circumference. He also gave many reasons to show that there was an intimate and organic relation between our English system of weights and measures and the Pyramid itself. This book fell into the hands of C. Piazzi Smyth, astronomer royal for Scotland, who was thereby drawn to Mr. Taylor as his especial and chosen pupil, and to whom he finally left the whole subject in charge.

In the spring of 1864, Mr. Smyth published a book entitled, 'Our Inheritance in The Great Pyramid,' a most significant title indeed, and declaring that our whole system of weights and measures was inherited by us either from that building or from those who built it. This work made so much impression that a gentleman provided a sum sufficient with his own means, so that Mr. Smyth was able to go to the pyramids that winter, and spend four months examining and measuring. He was the first of men in historic times who approached the building having the certainty of what it was, and the clue to work by in

studying it. Never was it so thoroughly and accurately measured. And so excellent was his skill that the most of his measures are not questioned, but are accepted as undoubted data to work from ; and those that are questioned are mostly so because he had not sufficient means to make all his work sufficiently thorough. The results of this work he published in three stout octavo volumes entitled 'Life and Work at The Great Pyramid.' The French had found two corner sockets. He uncovered them and found the other two also. He found also the long trenches in which the builders had laid out the angles, and a place in the rock where the trial form of the ascending and descending passages had been worked out.

Upon his return the whole subject became open to large and earnest discussion ; and in addition to the scientific features, a deep religious movement making the building a divinely ordained, prophetic record of God's great Messianic work, both before the advent of our Lord and after, including a distinct announcement of that event has been developed. This brings us to such recent times that a further account does not seem to be required.

JESSE JONES.

THE REFORM OF THE CALENDAR.

The INTERNATIONAL STANDARD for May has been received and read with deep interest.

Not being very well versed in the higher mathematics of Pyramid lore, and only a novice in the new Pyramid-faith, I do not fully understand all I read, nor can I accept all I believe to understand, but I can appreciate the sincerity of each writer, can feel the truth and catch the enthusiasm manifested on nearly every page, and am in full accord with the general aims of the International Institute, a membership in which I consider a great honor.

How strange that, with all our present facilities of communication and dissemination of news, a regular reader of the daily

papers like myself should have remained ignorant of the existence of our Society for more than five years, and become acquainted with it only a few months ago by sheer accident or—the design of Providence ?

Of old it has pleased Jehovah Jireh, among whose wondrous works I now count the Great Pyramid of Jeezeh, to select obscure and lowly instruments to work out His designs ; and now I verily believe that He has chosen me to become a disciple of the new faith and science of applied religion which has already claimed its martyrs in Czar Alexander II and President Garfield.

It therefore looks to me like design rather than accident that we should have remained strangers so long and worked independently in different directions for the same end ; but now that I have found you, and you have accepted me as a co-worker, I deem it my privilege and duty to assist you in the unveiling of Isis and some of the great problems of life propounded by the Sphinx before that venerable “ altar and pillar to Jehovah,” and enduring monument of Liberty “ guarding historic right ” in the midst of the house of bondage.

With a hearty hand-shaking and cordial greeting to all members of our Society, I will at once assume my special place therein and enter upon my special work, which is to earnestly labor with you for *the substitution of the Pyramid calendar for that of Julius Cæsar and Pope Gregory XIII*, as a first and most feasible step toward a universal adoption of all the other just weights and measures, the eternal and unalterable standards of which Jehovah Jireh has provided and preserved in the Great Pyramid of Jeezeh.

I claim this as my special mission, entrusted to me by divine Providence about a year before the memorable meeting at noon of November 8th, 1879, in the old South Church at Boston, the time and birthplace of the International Institute.

It did not come to me in a vague dream of the night, nor in a burning bush under the thunders and lightnings of Sinai, but is the gradual outgrowth of years of hard personal experience and quiet observation of natural and social phenomena.

Discouraged by many failures of honest endeavor, and de-

barred from the consolations of religion and Christian fellowship, I had plunged into the study of astronomy, seeking refuge from the disorders and confusion round about me in the grand order of the universe, and the sure testimonies of the Lord whose glory the heavens declare.

While thus engaged, a friend brought me Professor Simon Newcomb's new book on popular astronomy, one day in the fall of 1878, in the perusal of which I became at once deeply interested.

One morning thereafter I went to town, a few miles distant from my home, musing over the last sentence on page 50 of that book, which is as follows: "As the end of the century approaches, the question of making 1,900 a leap year, as usual, will no doubt be discussed, and it is possible that some concerted action may be taken on the part of leading nations looking to a return to the old mode of reckoning."

By old mode of reckoning Professor Newcomb evidently meant the "old style" or Julian calendar still in use in Russia, in which calendar every fourth year, including every secular year, is a leap year of 366 days, whereas according to the Gregorian reform thereof, which dropped ten days from the month of October, A. D. 1582, and suppressed three out of four secular leap years, thus adding only ninety-seven instead of one hundred days to the common year in the course of four centuries, the year 1900 should be a common year of 365 days.

By this reform the vernal equinox was restored from March 11, 1582, to March 21st, in 1583, and the average length of the calendar year was reduced from 365.25 days to 365.2425 days.

Arrived at the Fort Dodge Postoffice, I got a *Chicago Tribune*, as usual, and strange to say, the very first paragraph which attracted my attention was a telegram from St. Petersburg announcing that a congress of savans had been called by Czar Alexander II, to meet at some early date in 1879, to consider, among other proposed reforms, the question of adopting the Gregorian calendar.

It struck me at once as exceedingly strange that our superintendent of the Nautical Almanac and Czar Alexander should both be dissatisfied with their respective calendars and propose

THE INTERNATIONAL INSTITUTE.

64 Euclid Avenue, Cleveland, Ohio;

345 Tremont St., Boston, Mass.

President, CHARLES LATIMER, C. F., Cleveland, O.

Secretary, LUCIAN I. BISBEE.

THE FIRST NUMBER OF THE MAGAZINE WAS ISSUED MARCH, 1883.

Please find enclosed TWO DOLLARS, annual subscription for THE INTERNATIONAL STANDARD, commencing with

The.....Number. 188

Write Plainly. Name.....

Street.....

Post Office.....

County.....

State.....

NOTE :—Subscribers to the Magazine are immediately eligible for membership with the Society, and will be so received without further fee or payment of any kind (unless voluntarily offered), upon application to the President, 64 Euclid Avenue, Cleveland, O., when a beautiful chart (43 inches by 28 inches) of the Great Pyramid of Jeezeh, in sectional views, and other literature of the Society, will be forwarded post free to the member's given address.

Covering as they do a vast area, the aims of the Society are purely cosmopolitan in character. The benefits to be derived by and through the success of its efforts, are of in calculable importance to the Nations, and the commercial world in particular, hence it should receive the undivided attention and support of every thoughtful and scientific mind in the land ; while its main work in stemming, and ultimately destroying the fallacy called the French Metric System, is succeeding beyond our most sanguine hopes. See letters from Piazzì Smyth, Astronomer Royal of Scotland; Abbé Moigno, Canon of St. Denis Cathedral, Paris ; many important Scientists in England and Ireland, and in our own land.

All in favor of advancing the truth, as portrayed in the revelations of the Great Pyramid of Egypt, and for the success of the Society in preserving inviolate the Anglo-Saxon Weights and Measures, will kindly communicate with the President, by whom all subscriptions, donations and communications will be gratefully received.

Copies of the first number of the INTERNATIONAL STANDARD, with President Garfield's portrait, in steel, frontispice—will be forwarded free to inquirers and all earnest seekers after absolute truth, as exemplified in the inseparable conditions of all Science and Religion.

••••• Please fill up the above order without delay, when the Magazine will be forwarded immediately.

A portrait of a distinguished discoverer, worker or author in this field will appear in each Magazine.

All profits, if any, go to the Institute. All Contributions of Papers are Free to the Institute, and we rely for support upon the people who have the matter at heart.

THE UNIVERSITY OF CHICAGO

Department of the History of Art and Architecture

Office of the Director of the Program in Architecture

1100 East 58th Street, Chicago, Illinois 60637

USA

Phone: (773) 936-3333

Fax: (773) 936-3334

Internet: <http://www.historyofart.uchicago.edu>

Chicago, Illinois 60637

Chicago, Illinois 60637

Chicago, Illinois 60637

to swap horses instead of trading off their jaded studs for something new.

The Pyramid was then unknown to me, but one of the fundamental thoughts of its architect then and there began to loom up dimly through the mists of ages above the horizon of my mind.

The relation of the calendar to the general laws and customs of society involving the problem of finding a better way of equating unequal measures of time and space, as well as unequal conditions of life, began to possess and perplex me.

Any sudden and violent change was clearly not desirable. The Republican calendar with its *sansculottites* at the close of the year, and its three decades of each month abolishing the week and Sabbath day, had been tried and condemned by history, but that other *enfant terrible* and universal levelling rod of the French revolution, the metre, was still marching on triumphantly, conquering nation after nation of the old world as well as the South American Republics, and was then just getting ready to capture us too.

I felt that something ought to be done to arrest the spread of French ideas of equalization upon this continent, but what could I, an obscure private citizen, do single-handed in a matter of such magnitude and far-reaching consequences?

Well, I could write to our member of Congress and to the editors of our local papers, and so I did—but I am anticipating my story.

Not the metre, but the calendar was then uppermost in my mind, and various suggestions presented themselves. Professor Newcomb's proposed return to the Julian calendar involved nothing more serious than the addition of a single day to the year 1900, while the Czar's proposed adoption of the Gregorian calendar necessitated the dropping of twelve days, which, in the then existing temper of the Russian people, might lead to more serious riots than those accompanying England's passage from the old to the new style in 1752; the change, therefore, if made at all, should be made gradually. I thought, for instance, by dropping one day from each month of the year 1880, instead of dropping all twelve days at once; or better yet—why not

drop the additional day of the leap years only, and thus effect the desired transition in fifty years, instead of one year or one day?

With this thought in my mind I reached home again that same day, read a few more pages of Newcomb's Popular Astronomy, and, before retiring to bed, took up once more my much-neglected Bible, and as I was sometimes wont to do in more credulous bygone days, when in perplexity and doubt about anything, I opened the Word of God haphazard for direction. The very first verse my eyes lit upon was the tenth of the twenty-fifth chapter of Leviticus: "And ye shall hallow the fiftieth year, and proclaim liberty throughout all the land unto all the inhabitants thereof; it shall be a jubilee to you, and ye shall return every man unto his possession and ye shall return every man unto his family."

Preoccupied as my mind then was, my eyes dilated as I read these words. I read and re-read the whole chapter, and every line of it came down on me like a new and direct revelation from on high. Turning over to the New Testament, my finger pointed to this most significant verse: "There remained therefore a rest to the people of God" (Hebrew iv, 9), and with this I retired to bed at a late hour of that eventful day toward the close of the year 1878.

The next morning everything was clear to me, and I formulated my new commission as follows:

Be it enacted, etc.:

I. That from and after the first day of January, A. D.—, all years shall be counted at 365 days, except each fiftieth year, which shall be counted at 377 days, and shall be called a year of jubilee, and except each tenth jubilee, or five hundredth year, which shall be counted at 378 days, and shall be called the great jubilee.

II. That the year shall be divided into twelve months, of which the third, sixth and ninth shall have five full weeks of seven days each, the twelfth month five full weeks and one day, and all the other months four full weeks each, except in each year of jubilee, in which one day shall be added to each month

of the year, and in the great jubilee, in which an additional day shall be added to the last month of the year.

III. That the twelve additional days of each fiftieth year, and the thirteen additional days of each five hundredth year shall all be Sabbath days, and that in these years each month shall begin and end with a Sabbath day.

On the 3d day of January, 1879, I sent a copy of the above bill to the Hon. Addison Oliver, M. C., in a letter concluding as follows: "It is not likely that our present Congress will pass this bill, nor desirable that the proposed change, if adopted at all, should take effect before the first day of the twentieth century, which begins with a Monday and a new moon, but for the simple purpose of calling timely attention to this important subject, I beg you to present it to the House, have it read, printed, and referred to the Committee on Coinage, Weights and Measures, which, I am sorry to see, has recently reported in favor of the adoption of the French metric system. Last year an attempt was made to establish a common ratio between gold and silver as a uniform measure of value. This year Russia is moving to reform the Julian calendar, and hence a proposition on the part of the United States to reform the Gregorian calendar seems to me opportune, as a uniform measure of time is the most important and fundamental of all measures."

In the same month of January, 1879, Hon. Addison Oliver did present the above bill to the lower House of Congress. It was read, printed, and referred, duly ridiculed by the daily press and pigeon-holed by the Committee on Coinage, Weights and Measures. But my preliminary object was accomplished, my bark was fairly launched upon the great ocean, and now that I have become a member of your Society and a reader of the *INTERNATIONAL STANDARD*, I rejoice and am exceedingly glad to have been permitted to do what I then did, and with your aid I now hope to accomplish my stated mission and live to see the Pyramid calendar a duly enacted law of the United States of North America and of the whole civilized world. I call it the Pyramid calendar because it is plainly annunciated in the base of the Pyramid, iterated in the queen's chamber and grand gallery, reiterated and emphasized in the king's chamber and

in the chambers of construction, and will yet prove to be the passport out to all other as yet undiscovered chambers, as I now believe and hope to demonstrate in some future letter.

But for a rainy day this letter would not have assumed the formidable proportions it has, and yet my tale is not yet half told, but for the present I must defer its continuance.

F. HESS.

THE ALTAR AND PILLAR TO JEHOVAH.

V.

Every aspect of the Great Pyramid, though involved in every other, is of sufficient importance to demand separate consideration. This has been accorded the view of it as an altar, and as a tower, and must now be accorded it as a treasury, notwithstanding the much that has been said on this subject incidentally in my identification of the Great Pyramid with the Great Tower. By virtue of its interior, and of the treasures deposited therein, a pyramid constituted a treasury; by virtue of the refuge found therein it constituted a hold or stronghold; and by virtue of the presence therein of the deified hero to whom the treasures belonged, including his body, the most precious treasure of all, it became a sacred shrine, a memorial altar, a house of God, a gate of Heaven, a temple of the Holy Spirit. For the sake of clearness, let us take up, in the order of succession, the steps of progressive development here indicated, and see to what conclusion they will lead us in regard to the greatest of the Great Pyramids of the world, that of the pastoral Prime Minister of Cheops and Cephren.

In the first place, the primary object of a pyramidal tower being a treasury, the entire structure was subservient to its interior; and this being called in the Old Testament "the secret place," the structure which encompassed it as the guardian of its treasures was sometimes called "the secret place," as well as sometimes "the treasury." A case of this kind occurs in

the twenty-fourth verse of the fifth chapter of Second Kings, where the word translated "tower" in the text is translated "secret place" in the margin. Here "the tower," in whose "secret place" the servant of Elisha bestowed his ill-gotten treasures, was clearly a treasury. According to the translation he "bestowed them in the house," but anyone can see that this means a chamber in the tower and not the residence of his master. The profanation of depositing these ill-gotten treasures in the secret place was similar to that concerning which it was said by the Levites to the people, "Cursed be the man that maketh any graven or molten image, an abomination unto Jehovah, the work of the hands of the craftsman, and putteth it in a secret place." (Deut. xxvii, 15.) Therefore Elisha said to his servant, "the leprosy of Naaman shall cleave unto thee, and unto thy seed forever"; and Gehazi went out from the presence of his master "a leper, as white as snow." Apparently of a treasury consecrated to Jehovah, in the figurative sense of the language, Jehovah says to Israel, "As for the beauty of his ornament, he set it in majesty; but they made the images of their abominations and of their detestable things therein: therefore have I set it far from them. And I will give it into the hand of the strangers for a prey, and to the wicked of the earth for a spoil: and they shall pollute it. My face will I turn also from them, and they shall pollute my secret place: for the robbers shall enter into it, and defile it." (Ezek. vii, 20-22.) To some extent in the literal, but chiefly in the figurative sense of the language, God said to Cyrus, "I will give thee the treasures of darkness, and hidden riches of secret places, that thou mayest know that I, Jehovah, who call thee by thy name, am the God of Israel." (Isa. xlv, 3.) And under the figure of the Great Treasury, the Great Pyramid itself, if I mistake not, the Psalmist says, "He that dwelleth in the secret place of the Most High, shall abide under the shadow of the Almighty. I will say of Jehovah, He is my refuge, and my fortress: my God; in him will I trust." (Ps. xci, 1, 2.)

This leads me to my second position—that by virtue of its interior as a refuge a pyramid constituted a hold or stronghold. Of this the Psalmist had sufficient literal experience to furnish

ground for the lofty figurative language just quoted, in which he appears to recognize the Great Pyramid as a symbol of Jehovah. From the cave of Adullam, which in the fifty-seventh Psalm he calls a "refuge," symbolizing "God Most High," David fled to a similar refuge called "the hold," in the capital city of the King of Moab; and what could this "hold" have been but the interior of a tower, like the cavernous interior of a mountain? After this "David abode in the wilderness in strongholds, and remained in a mountain in the wilderness of Ziph." (1 Sam. xxiii, 14.) The passages showing the likeness in character and use between a cave in a mountain and the hold in a tower, justifying the old designation of the pyramids of Egypt by the term "Pharaoh's mountains," are numerous and striking. "Because of the Midianites the children of Israel made them the dens which are in the mountains, and caves, and strongholds." (Jud. vi, 2.) That the artificial mountains of the ancients were like natural mountains in offering their cavernous interiors for the concealment and safety of refugees, as well as of precious treasures, is exemplified in "the tower of Shechem," from whose interior, called "the house of Baal-Berith," the men of Shechem took the "three score and ten pieces of silver" for Abimelech, the slayer of the "three score and ten sons" of Gideon, wherewith he "hired the vain and light persons who followed him"; for in the same chapter (the ninth of Judges) this treasury stronghold is spoken of as "an hold of the house of the god Berith," into which "the men of the tower entered" when they heard that Abimelech and his followers had already slain the inhabitants of the city and were approaching the tower. The city appears to have encircled the lower section of a wooded hill in a wide part of the valley, between Mount Ebal and Mount Gerizim, while the citadel occupied the summit, and was built of timber rather than of rocks; for it is said that Abimelech and his men, in their ascent, cut down boughs, with which they "set the hold on fire, so that all the men of the tower of Shechem died also, about a thousand men and women." Nevertheless, it is evident that the fighting place of the tower was its outside, and this requires us to believe that it was "built in steps, battlement-wise," like the Great

Pyramid. The fate of the men who entered into it to escape the vengeance of the man whom they had expelled from the city illustrates the fatality of trusting in a false god. In contrast with it is this in Nahum: "Jehovah is good, a stronghold in the day of trouble, and he knoweth them that trust in him," (1, 7); also this in the Psalms: "Lead me to the rock that is higher than I; for thou hast been a shelter for me, and a strong tower from the enemy," (lxi, 2); and this in Proverbs: "The name of Jehovah is a strong tower; the righteous runneth into it, and is safe," (xviii, 10). If in all the world there is a more fitting basis for these figures of speech than the Great Pyramid, what is it? In Jeremiah the true God, in contrast with false gods, under the symbol of what seems to me the Great Pyramid, as being now revealed to the Gentile world, is presented as the true object of confidence, in a single paragraph, which is this: "O, Jehovah, my strength, and my fortress, and my refuge in the day of affliction; the Gentiles shall come unto thee from the ends of the earth, and shall say, Surely our fathers have inherited lies, vanity, and things wherein there is no profit. Shall a man make gods unto himself, and they are no gods? Therefore, behold I will this once cause them to know mine hand and my might; and they shall know that my name is JEHOVAH." (xvi, 19-21.) "There be gods many and lords many," but only one Jehovah, and this we are to learn once for all from the Great Pyramid.

It is said that the word Baal "means *Lord*, but not so much in the sense of Ruler as in that of *Master, Owner, Possessor*"; also that Beri means *son*, and Berith *covenant*. I therefore think it highly probable that "Baal-Berith," to whom the Shechemites dedicated their treasury-stronghold, and who was worshiped by the Israelites after the death of Gideon, was the deified builder of what may be regarded as the oldest treasury-stronghold in existence, that of Cain, which he built in the desert "on the east of Eden," and "named after his son Enoch." For reasons to appear hereafter, I think he built it on the top of a mountainous rock in Arabia Petrœa. Good Hebrew scholars say that what Cain built was not "a city" but "a citadel." As such, it was the nucleus, and in a manner the representative, of the

city that was to gather about it, beginning at the base of the conical hill, and growing upward and inward toward the summit, on which stood the center of attraction. That this is not a purely gratuitous assumption, in respect to the principles involved, is seen in the parallel case of "the stronghold of Zion," taken by David from the Jebusites, concerning which it is said that he "dwelt in the fort, and called it the city of David," and "built round about it, from Millo and inward." (2nd Sam. v, 9.) In the days of Abraham, and long afterward, the mountainous land of Canaan was chiefly divided up into petty kingdoms, each consisting of little more than a fenced city on a conical mountain, growing from the circumference towards the citadel in the midst; so that the great majority of the inhabitants of a kingdom were "citizens," in the literal sense of the word, and not in the conventional sense, as now. Civil governments, therefore, not excepting the great empires of the world, such as Egypt and Assyria, whose vast alluvial valleys and plains favored both the ambition and the power to merge many diverse kingdom into a complex kingdom, are in the prophets referred to under the symbol of mountains, while the ecclesiastical governments, inseparable from the civil in the theocracies of those days, are referred to under the symbol of cities clothing the mountain sides. The artificial mountains of the ancients, *i. e.*, the citadels, had the same significance as the populous, natural mountains on and in the midst of which they were situated, just as the capstone of the Great Pyramid had the same significance as the Pyramid as a whole. We may therefore readily admit that citadels nominally represented cities in the case of Pi-Thom and Ra-Amses, as a citadel represented "the city of David" in the case of "the stronghold of Zion." On the same principle the Great Citadel, the "altar to Jehovah in the midst of the land of Egypt," represented Egypt, the populous kingdom or city in the midst of which it was situated; so that by the "coffin in Egypt" may reasonably have been meant the coffer in the Great Pyramid. The occupation of this coffer in the pyramid "Aramœus" by the body which "such a man" as Joseph had once occupied, like the occupation of the new sepulcher of Joseph of Arimathea by the dead body of the Christ, did not

profane it, but rendered it all the more sacred. It changed the stronghold of the man present in the body, and that of his treasures of gold and silver and precious stones, into a memorial altar, a shrine sacred to the memory of his heroic virtues and achievements, and to the preservation of his precious remains, his sacred relics, the ruins of that noble temple which had been the revered abode and beloved manifestation of the spirit.

The fact that natural mountains preceded the artificial in offering their places of refuge for places of sepulcher, we see in the tombs of the patriarchs. Sarah and Abraham, Rebekah and Isaac, and Leah and Jacob, were buried near Hebron, probably on the side of "the mountains of Judah," in the cave of Machpelah, or the double cave which Abraham bought of Ephron, the Hittite, for "the possession of a burying place." (Gen. xxv, 10, and xlix, 29-31.) "And the bones of Joseph, which the children of Israel brought up out of Egypt, buried they in Shechem, in a parcel of ground which Jacob bought of the sons of Hamor, the father of Shechem, for a hundred lambs, and it became the inheritance of the children of Joseph." (Joshua xxiv, 32.) It had belonged to "the sons of Hamor" in the sense that Hamor had intended it for a primogenital burial place, under a law like that of the Hebrews, I suppose; but no doubt the business transaction was between Jacob and Hamor. And I think that this "parcel of ground" was not a *plot* of ground such as a man purchases for his family burying ground in a cemetery, but a literal "parcel," in the sense of a *package* composed of a mass of earth and containing a treasure of some sort, or enclosing a vault for the reception of a treasure, like a certain style of tomb in our modern cemeteries, packed about with earth, in the form of an Indian mound or diminutive teocalli, overgrown with grass on all sides except the stone facade with its door for entrance. Joseph being such a pre-eminent type of the Saviour in his humiliation and exaltation, in his forgiveness of his enemies, in his return of good for evil, in his spotless purity, in his wisdom and love, in his deep and overflowing sympathy, and in the wonderful salvation from death wrought through his instrumentality, I must think that the "parcel of ground" bequeathed him by his father contained

“a sepulcher hewn out of a rock” in imitation of a cave in a mountain, “wherein man never was laid,” not even Joseph, but his bones, to prophesy the resurrection. This “parcel of ground” had been purchased by Jacob from Hamor and recaptured by Israel from the Amorites nearly three hundred years before its appropriation to the final and sole use for which Providence intended it; and on no other theory than that it was set apart for sepulchral purposes, and that the Shechemites were half Israelite, being the descendants of Shechem and Dinah, can we account for its having been preserved inviolate for so long a time. “Jacob’s well” and “the parcel of ground that Jacob gave to his son Joseph,” where Jesus met the “woman of Samaria,” were side by side, and the woman who “had had five husbands, and the sixth was not her husband,” was just the sort of woman to have descended from the loving but unlawful relationship between Shechem and Dinah, on account of which Simeon and Levi, in their zeal for purity, so treacherously and cruelly murdered both Shechem and his people. The fact that the Shechemites were of such a loving and forgiving disposition as not to avenge so foul a murder and such a dishonorable breach of a solemn covenant, explains the character of “the good Samaritan.” And but for the adultery with which the tribe of Dinah, so to speak, was tainted at its fountain head, and with which it was pervaded throughout, as represented in the woman of Samaria—but for this, in connection with the preliminary commission of the Christ to his disciples, “Go not into the way of the Gentiles, and into any city of the Samaritans enter ye not, but go rather to the lost sheep of the house of Israel”—I might think that the fourteenth tribe of Israel, prophetically represented by the top stone of the pyramid of whole stones, is the tribe of Dinah, as suggested by a lady correspondent of our Society, instead of believing it to be the tribe of Joseph by the “issue” to be born to him after Ephraim and Manasseh, which I take to be the Coptic population of Egypt, whose ancestors of the days of the Apostolic Church, besides being among the first to embrace Christianity, were first and foremost in carrying its principles of purity to the extreme of celibacy and monasticism.

The privilege of burial in a pyramidal tomb was so evidently a birthright inheritance that I challenge proof to the contrary. But for the decree, "In Isaac shall thy seed be called," Ishmael, rather than Isaac, would have been buried in the mountain cave with his father Abraham; but for Esau's sale of his birthright to Jacob, he, rather than Jacob, would have been buried in that cave; but for Laban's dishonorable substitution of Leah for the promised Rachael, Rachael, rather than Leah, would have been laid in the cave which was to receive Jacob; but for Reuben's forfeiture of the birthright by his incest, he, rather than Joseph, would have been the inheritor of the "parcel of ground" intended for sepulchral purposes; and but for Jacob's adoption of Ephraim and Manasseh for his own sons, Joseph would not have been the first and last occupant of that precious parcel, but Manasseh, his first-born, would have shared it with him.

Israel, in his bequest of this "parcel of ground" to Joseph, calls it "the one portion" (in the original "the shoulder," probably, say the commentators, on account of its shoulder-like figure,) "above his brethern," and refers to it as having been taken by himself from the Amorite with his sword and his bow (Gen. xlviii, 22), implying that after his purchase of it from Hamor, the prince of the Hivites, it had been captured and garrisoned by the Amorites as a stronghold at some period of the fourteen years between the date of Joseph's being sold into Egyptian bondage and the date of his removal of his father and brethren to Egypt from the famine in the land of Canaan—an interval of time exclusively occupied by the sacred historian in narrating the story of Joseph. The circumstance of its capture and recapture by force of arms, shows how easily the place of sepulcher could revert to its original use as a treasury-stronghold, and how easily it could be reconverted into a sacred depository of the mortal remains of the inheritor of the birthright. In the eleventh chapter of First Chronicles is mentioned "a parcel of ground full of barley," evidently not a field of growing barley, but a depository of grain in the form of a pyramidal hill, "in the midst" of which stood the mighty Eleazar and his men, as it were "in the midst of Mars' hill," to prevent its capture by the armed Philistians, who were bent

on plundering it of its contents. Naomi's "parcel of land" (Ruth iv, 3), the property of her dead husband Elimelech—and after him the property of her childless sons, Chilion and Mahlon, all of whom died in the land of Moab—was evidently of no value for cultivation, but was a birthright possession, dedicated to the burial of the first-born son in a limited series of generations, and therefore requiring to be "redeemed" by the marriage of the childless wife of the deceased Mahlon to his nearest kinsman, to raise up to him the lawful inheritor of his inalienable possession. From this redemption of a birthright inheritance, involving, as it did, the espousal of Ruth to Boaz, came the Great Redeemer, the Lamb of God, who hath purchased with his own blood, and by "the marriage of the Lamb" to "the Lamb's wife" will seal "the heathen for his inheritance and the uttermost parts of the earth for his possession." To this "the only begotten and well-beloved Son of God" humbled himself; for his is the great birthright by the law of primogeniture, the inheritance of the world by the right of "the first-born among many brethren," prefigured by the inheritance of Isaac and Jacob in the cave sepulcher of Abraham, and more especially by that of Joseph in the hewn out sepulcher bequeathed him by Israel; and why not prefigured by the inheritance of the children of Joseph in that symbol of the world of matter and of mankind, the "altar of Jehovah in the midst of the land of Egypt?" This world is a great "whited sepulcher, full of dead men's bones, and all uncleanness," of which Christ Jesus is "the Resurrection and the Life;" and why need any one feel shocked at the idea that the Great Pyramid, in order to represent such a world more perfectly, once contained in its sarcophagus, in its most interior and wonderful apartment, the dead body of its inspired architect?

In keeping with the idea that "the parcel of ground" in which Joseph's bones were interred was a sort of teocalian mountain, or huge altar of earth, is the fact that their interment therein is mentioned between that of the body of Joshua "on the north side of the hill Gáásh" and that of the body of Eleazar "in a hill that pertaineth to his son Phinehas," as if to indicate the inclusion of art in nature, as being her means to the

fulfillment of her end in the attainment of her final perfection. For Shakespeare does but echo Nature's children of the early ages when he says, "Nature is made better by no mean, but Nature makes that mean; over that art which you say adds to Nature, is an art that Nature makes; and art itself is Nature."

Before purchasing "the parcel of ground," Israel pitched his tent upon it; and there, probably in the midst of its commanding height, he erected the altar which he called "El-Elohe-Israel" (God, the God of Israel.) No doubt the sons of Israel, as well as Israel himself, worshiped at this altar on the great "shoulder" of ground; and to this, it seems to me, rather than any temple on Mount Gerizim, the woman of Samaria referred when she said to Jesus, "Our fathers worshiped in this mountain; and ye say that in Jerusalem is the place where men ought to worship." For the two places then present to Jesus and the woman, *i. e.*, "Jacob's well" and "the parcel of ground given by Jacob to his son Joseph," were the subjects of their conversation, in their literal character on the part of the woman, and in their spiritual signification on the part of Jesus. To the Samaritan preference for the older place of worship, as compared with the temple at Jerusalem, which the Samaritans ascribed to Medes and Persians, rather than to Israel, Jesus replied, "Woman, believe me, the hour cometh when ye shall neither in this mountain, nor yet at Jerusalem, worship the Father. Ye worship ye know not what; we know what we worship, for salvation is of the Jews. But the hour cometh, and now is, when the true worshipers shall worship the Father in spirit and in truth, for the Father seeketh such to worship him. God is a Spirit, and they that worship him must worship him in spirit and in truth." As the great Teacher had previously unfolded the spiritual meaning of Jacob's well, at the foot of the mountain, where they sat and conversed, did he not here, in what he said of the mountain as a place of worship, unfold the spiritual meaning of that consecrated spot, "the parcel of ground given by Jacob to his son Joseph" for a possession of a burying place? In connection with Jacob's allusion to it as taken from the Amorite with his sword and his bow, it is altogether reasonable to believe that "this mountain" and "the

parcel of land given by Jacob to his son Joseph" were one and the same. If this be admitted, the teocalian sepulcher of Joseph, at the foot of which the King of the Jews and the woman of Samaria held their conversation, was indeed a "house of God," a "gate of Heaven, "a temple of the Holy Spirit." "Joseph's bones," supposing them represented in the bones of his skull, the dome of thought, the temple of the soul, "were visited" in his life time by an inspiration of the Spirit of Truth, and after death "they prophesied" of the resurrection. (Eccle. xlix, 18). The Jews, especially the Levites, so hated and despised the Samaritans, and perhaps so feared a rising up in judgment against themselves for their cruel hatred and contempt, as to deny that they could have any part in the resurrection from the dead. As if in anticipation of this prejudice, the bones of Joseph were deposited in "the parcel of ground" purchased by Jacob from the sons of Hamor, making "the valley of Achor a door of hope" by their prophesy of the resurrection of the dry bones of the Shechemites slain by Simeon and Levi, and making these bones a symbol of "the whole house of Israel," who had fallen victims to the adulterous mixture of idolatry and the worship of Jehovah practiced by the Shechemites, with whom, as being chiefly the descendents of their sister Dinah, they resided on terms of fraternity and good will. When the "Son of Man" shall prophesy to the dry bones of the valley of Shechem, or of Achor, "O, ye dry bones, hear the word of Jehovah," and to the breath, "Come from the four winds, O, breath, and breathe upon these slain, that they may live," the Jews will see "the publicans and harlots," the "lost sheep," and the Samaritans, "entering the Kingdom of Heaven before them," in the form of "an exceeding great army," with Joseph at its head manning his teocalian mountain and "pressing into the Kingdom of Heaven" in a manner seeming to "take it by force." With the resurrection the great charnel house, which this earth is seen to be, will be reconverted into that great treasury-stronghold, heaven on earth, in the form of the holy city, New Jerusalem, against which "the gates of hell shall not prevail."

The Great Pyramid is called a symbol of this earth, but it is

not so much this as it is a symbol of heaven on earth, such as the world was "when the morning stars sang together, and all the sons of God shouted for joy," and such as it will be again when the New Jerusalem shall descend "from God out of heaven, prepared as a bride adorned for her husband." For not only Job's description of this world as it was before the fall, but John's description of it as it will be when its redemption shall have been completed, is that of a pyramid. (Job xxxviii, 3-7, and Rev. xxi, 1-27.) In the resurrection, when the redeemed "shall be as the angels of God in heaven," the "altar of Jehovah in the midst of the land of Egypt" will no longer be a shrine sacred to the memory of "the tree of life in the midst of the garden," and no longer a prophesy of its reappearance "in the midst of that paradise of God," the New Jerusalem, but will be lost in the realization and fulfillment of its own significance, as at high noon in mid-summer its shadow is lost in its substance. Heaven on earth will then shine forth as the great treasury-stronghold and temple of the Holy Spirit, where they who have laid up their royal diadems and priestly robes in heaven will find them free from moth and rust, their hearts there also, redeemed from corruption "by the precious blood of the Son of God," and they themselves "kings and priests unto God and the Lamb."

J. W. REDFIELD.

LONG OR SHORT FRACTIONS FOR GREAT NATIONAL STANDARDS.—EARTH'S AXIS OF ROTATION.

In the two last numbers of the "American School of Mines Quarterly Journal," the learned President Barnard, of Columbia College, New York, has involuntarily opened a question of far wider interest than the particular one with which he set out. For on his page 120, there appears the following remarkable statement:

"The length of the polar axis of the earth is a quantity

which may with strict truth be pronounced to be, up to this time, absolutely unknown!"

Now if that really be so, the people of every civilized country on the face of the earth, who have been taxed during the last hundred years to the extent of millions and millions for the support of magnificent arc-of-the-meridian measuring establishments, have some right in common sense to rise with revolutionary wrath and demand how the enormous sums of their money, given to determine the size and shape of the earth, have been expended. And when shall we know the far greater distance of the sun?

But the statement can only be true on some private interpretation, which is needless to inquire into; for when we take the various lengths of the earth's axis of rotation as determined in modern times, and collected by President Barnard himself from very diverse sources indeed, we find them all to be coincident down to four places of figures at least. And considering that for some other most important national standards the world is apparently content with a certainty of two places of figures only, the officers of the several trigonometrical establishments (including the United States coast survey) of all the countries of Christendom deserve high praise, rather than condemnation, for the results they have thus far succeeded in bringing out.

The mean of their last five measurements, as given by President Barnard for the axis of the earth, is 500492732.8 British inches; the ten-millionth part of which is evidently 50.04927328 British inches, though he has chosen to bring it out as a very different quantity indeed, viz: 49.273 British inches.

But the really important point now to be discussed is whether in practical use as a standard of measure, either on paper or for mechanical work, we should attempt to realize, or wait through ages for the improvement of that long fraction; or may we at once be content with the 50.05 British inches, at which, as quoted by the President, I had years ago ventured to assume the said ten-millionth of the earth's axis of rotation.

In place of merely, and perhaps somewhat vainly, *theorizing* on the subject, let us look to the growth of modern opinion on a much older question, but connected with the same axis of ro-

tation, viz:—the number of solar days in the tropical year, reckoned now to be $365.2422414 \pm$; but assumed in the old Julian year = 365.25 .

Pope Gregory's reformation of the calendar, by introducing the former—or something like it—in place of the latter quantity, caused sufficient disturbance to all the ordinary affairs of men in every nation when it was first accepted, and has some arguments which may be alleged in its favor still.

But if I read aright a recent tract by so consummate a physical astronomer as Professor Simon Newcomb, he holds that the Gregorian alteration has done so much more harm than good, being quite a needless refinement, and is so totally unsuitable to calculations in physical astronomy compared with the Julian year, that civilized nations should, and will, he says, presently return to that kind of year and its "old style" reckonings, leaving a few curious computers, whom it may concern, to prepare tables of corrections where they are absolutely required for their own abstruse and recondite purposes.

15 Royal Terrace, Edinburgh.

C. PIAZZI SMYTH.

P. S.—"Nature" journal just arrived, has inserted my letter on the length of the ten-millionth of the earth's axis of rotation, and President Barnard's differing value for the same; and the case forms a good illustration of the importance in applied mathematics, after the existence of anything whatever has been asserted, of asking "how much."

Now, agreeing so far with the President that the mean of five of the best and latest arc-of-the-meridian measures, give for the earth's actual axis of rotation, = $500,492,732.8$ British inches, then accepting that as the truth, the error of my assumption in all my Pyramid books for the ten-millionth of the earth's axis of rotation, viz: 50.05 of the same inches, is evidently $50.05 - 50.04927328 = .0007 + \&c.$, or only sensible in the 4th place of decimals of an inch.

But if you take President Barnard's value (page 214 of the "School of Mines Quarterly Journal") of the earth's axis of rotation length, viz: 49.273 British inches, the error of that is

50.04927328—49.273=.776 of an inch, a terrifically large quantity.

So if he has called my Pyramid work a disgraceful break-down in accuracy, what words can be found strong enough to describe his error 1000 times greater?

C. P. S.

GLEANINGS FROM PETRIE'S NEW BOOK,

'THE PYRAMIDS AND TEMPLES OF GIZEH.'

Several years have passed since our Society began to look about for means to send a surveying expedition to Egypt. We have had the conviction that only by a thorough remeasurement of the Great Pyramid could some of its disputed dimensions be settled, particularly the length of its base. But thus far we have been unable to fit out the expedition.

Meanwhile Mr. W. M. Flinders Petrie, a competent English engineer, has made a thorough triangulation at the Pyramid, and elaborate measurements of its parts, and his work has received the stamp of approval by that self-appointed and world-accepted autocrat of modern science, *The British Royal Society*; for we find immediately following the title page of his new book, this sentence standing conspicuous and alone:

Published with the assistance of a vote of one hundred pounds from the Government Grant Committee of the Royal Society, 1883.

The high reputation of Mr. Petrie, enhanced by the masterly manner in which he has made and recorded this survey, the indorsement of the British Royal Society, and especially the pronounced opinions of both the Society and the individual surveyor against our interpretation of the Great Pyramid, combine to give the highest possible weight to any favorable testimony which Mr. Petrie's survey may give us.

What then is the significance of the following gleanings from his report?

THE EGYPTIAN CUBIT CORRELATED TO THE BRITISH INCH.

Mr. Petrie says that "unquestionably" the Great Pyramid

“takes the lead” of all the other pyramids “in accuracy and in beauty of work, as well as in size”; that the king’s chamber “is the most accurately wrought, the best preserved, and the most exactly measured, of all the data that are known for determining the value of the usual [Egyptian] cubit.” On page 81 we read: “Probably the base of the chamber was the part most carefully adjusted and set out; and hence the original value of the cubit used can be most accurately recovered from that part. The four sides there yield a mean value of $20.632 \pm .004$, and this is certainly the best determination of the cubit that we can hope for from the Great Pyramid.” But on page 179 we find, “But taking the king’s chamber alone, as being the best datum by far, it nevertheless contracts upwards, so that it is hardly justifiable to adopt a larger result than $20.620 \pm .005$.”

Now, if we take the mean of Petrie’s two values, viz.: $\frac{20.632 + 20.620}{2}$, we get 20.626, which harmonizes as nearly as three decimal places will approximate to Mr. Skinner’s British inch theory, as interpreted by my π formulæ for dimensions of king’s chamber, which give width = $\frac{648}{\pi} = 206.264806 +$ (Magazine, vol. 1, p. 25); and this, Mr. Searles shows to be equal to 10 Egyptian cubits. (See Magazine, vol. 1, p. 45.) Hence, if Mr. Petrie’s measures are to be trusted, they prove at least the *fact*, if not the *intent*, that the Egyptian cubit of the Great Pyramid and the present Imperial British inch are correlated, so that for one Egyptian cubit measured on the diameter of a circle, 64.8 British inches will be measured on the circumference of the same circle; or, in a circle whose radius is 10,000 Egyptian cubits, the circumference will measure exactly 1296000 British inches, or one inch for every second of arc; making, thus, a quadruple correlation of Egyptian cubits, British inches, modern circular measure, and our decimal system.

BRITISH INCHES RECORD THE LENGTH OF THE MEAN SOLAR YEAR IN
THE BASE OF THE GREAT PYRAMID.

On page 39 we read: “This square [whose corners lie on the diagonals of the sockets] of the original base of the Great Pyramid casing on the platform is of these dimensions: N. 9069.4,

E. 9067.7, S. 9069.5, W. 9068.6—mean 9068.8"; and the mean error given is $\pm .65$. These figures all denote British inches, for in the *Introduction* we read, "All measures stated in this volume are in Imperial British inches."

We are told, too, that the sockets for the corner stones of the Pyramid are at different levels below the pavement, the S. E. socket being the lowest (39.9 inches below the pavement, p. 40); "that the socket corners vary from a true square in proportion to their depth below the pavement, the sockets nearer the centre being higher." "This means that the sockets were cut to receive the foot of the sloping face [of the casing] which was continued right down to their floors, beneath the pavement," and that "the socket corners lie in the diagonals of the Pyramid casing." (See pages 38 and 39.)

Again, as to the angle of slope of the Great Pyramid, we find on page 42 :

Casing stone, <i>in situ</i> , N. side, by theodolite (to three points on top and three on base), - - -	$51^{\circ}46'45'' \pm 2'7''$	WEIGHT. 7.
To three points by goniometer and level, - - - - -	$51^{\circ}49' \pm 1'$	2.
N. face by entrance passage mouth,*	$51^{\circ}53'20'' \pm 1'$	10.
N. face by air channel mouth,* -	$51^{\circ}51'30'' \pm 20''$	5.
N. face, weighted mean, - - -	$51^{\circ}50'40'' \pm 1'5''$	
S. face by air channel mouth, -	$51^{\circ}57'30'' \pm 20''$	

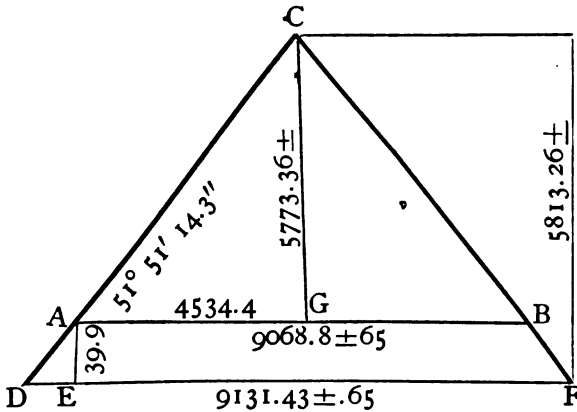
On page 43, the author says: "On the whole, we probably cannot do better than take $51^{\circ}52' \pm 2'$ as the nearest approximation to the mean angle of the Pyramid, allowing some weight to the South side."

Now, if we turn to page xv. of the *Introduction*, we shall find what Mr. Petrie means by the \pm error: "The probable error is an amount on each side of the stated mean, within the limits of which there is as much chance of the truth lying as beyond it—*i. e.*, it is one in two that the true result is not further from the

* Of these two measures, the latter of which differs but $15.7''$ from the true \star angle, Mr. Petrie says: "The datum for the air channel, though far more accurate than that by the passage mouth (being on a longer length), is not so certainly intentional, and is therefore not worth as much."

stated mean than the amount of the probable error." Then, since the true π angle of slope, $51^\circ 51' 14.3''$, does not fall without the probable error of Mr. Petrie's $51^\circ 52' \pm 2'$, but lies well within it, we see that his measurements confirm John Taylor's theory of the true π proportion of the Great Pyramid as accurately as their limits of probable error permit them to testify.

Let us now calculate the length of the base of the Pyramid at the level of the S. E. socket floor, using Petrie's data already quoted, but substituting the true π angle of the slope.



Radius : 4534.4 :: $\text{tang. } 51^\circ 51' 14.3''$: 5773.36 = CG. And $5773.36 + 39.9 = 5813.26$. Then $5813.26 \times \frac{2}{3} = 9131.43 = DF = \text{base of Pyramid at level of S. E. socket floor}$. But the probable error of Petrie's 9068.8 being given by him as $\pm .65$, the socket base DF cannot have a less error than $\pm .65$.

Now Professor Piazzi Smyth's theoretical measure of the base is, numerically, 9131.055, which lies much within the limits of probable error of Petrie's $9131.43 \pm .65$; hence, the whole weight of these data from Petrie goes to confirm, but at the same time, apparently, though perhaps not really, to correct Professor Smyth's year length measure of the base of the Pyramid, for the corrected formula will read:—

Perimeter of base of Pyramid in Imperial British Inches*

100

=length of mean solar tropical year, or $\frac{9131.055 \times 4}{100} = 365.2422$.

Many of our friends have failed to perceive anything more than a mere coincidence in the appearance of the British inch and the modern circular measure in the king's chamber. They have said that my π formulæ † prove ratios only, not dimensions. But what will they say now of the British inch in its record of the year length in the base of the Pyramid? Is it a mere accident that the British inch makes the very record which, of all records, would be the most appropriate one to be made in that most important dimension of the grandest structure ever reared by man?

But we have not yet proved from Petrie that the architect of the Pyramid intended to record the year length to the accuracy of 365.2422 days; yet this must be proved before we can convince the world that the architect was any other than an Egyptian; for authorities affirm that the Egyptians knew the year length to the accuracy of $365\frac{1}{4}$ days, ‡ and Petrie's measures, with their $\pm .65$ error, are not sufficiently exact to discriminate between $365\frac{1}{4}$ and 365.2422.

Possibly a full mathematical demonstration of the superhu-

* Instead of Pyramid Inches as given by Professor Smyth.

† See, *The Argument Condensed*, Vol. 1, page 24 of Magazine.

The formula there given for base of Pyramid is $\frac{180^2}{2\sqrt{\pi}} = 9139.8712581+$; and Rev. H. G. Wood (in vol 1, page 496 of Magazine) has proved from Petrie's "Table of co-ordinates of marked stations," and his record of socket levels, that this is the true distance from corner of S. E. socket to corner of N. E. socket projected at the arris slope to the level of S. E. socket. Mr. Petrie says, page 38, "When the casing was duly projected down at its angle of slope to the socket floors, it was found to fall on an average 4 inches inside the edges of the socket corners." This would make the casing base about 8 inches less than the socket base; and $9139+$ less 8 inches is $9131+$, just as we have calculated it in the present article. Perhaps a part of the significance of the socket base, $9139+$, lies in its diagonals, which may be intended to mark the precessional period. If so, we escape the improbable theory, heretofore held, that a single square measures the year length, the earth's orbit circumference, and, by diagonals, the precessional period. It is also worthy of consideration that 9139.87 British inches are equivalent to 9131.05 Pyramid inches, and may have been intended to mark the year length in Pyramid inches.

‡ See Smith's Bible Dictionary, Article, Egypt.

man perfection of the Great Pyramid record will very soon be revealed, through the relations of the grand gallery to the Pyramid base. We will consider, therefore,

THE YEAR LENGTH IN THE GRAND GALLERY.

On page 71, the "distance on slope" of the grand gallery from North wall to the "South wall in same line" is given as 1883.6. Now is the following a mere coincidence, or is it intentional?

The corrected base at S. E. socket level, 9131.055, multiplied by the width of king's chamber taken in decimals, *i. e.*, .206264806, (or $\frac{.648}{\pi}$) = 1883.415288, or within .2 of an inch of Petrie's measure of the grand gallery floor, and presumably within the probable error which he would allow. †

If the grand gallery is prophetic, and foretells events which are near at hand, expressed in our current chronology by means of the modern Imperial British inch, then the course of events may be so distinctly marked, and exactly dated, during this year 1884, as to formulate for us, through this grand gallery floor equation, the exact year length intended by the architect. But I do not care to meddle with questions of unfulfilled prophecy. Let the future decide them.*

CONCLUSIONS.

The builders of the Great Pyramid worked in Egyptian cubits: this is evident from the integral character of their lines, when expressed in cubits, in contrast with the endless fractions which the inches record. I doubt if the Egyptians, or their rulers, ever dreamed of the inch; neither has the British Parliament wittingly correlated the Imperial inch to the Egyptian cubit; ‡ but an overruling Providence seems to have adjusted the one to the other, that the world may have proof, just that scientific proof for which they are incredulously clamoring,

† Petrie does not give the \pm error of this measure.

* Mr Baxendell has objected to the British inch theory, that it does not formulate the year length, either in the Pyramid base or in the grand gallery. Thanks to Mr. Petrie, we now learn how it does both.

‡ Yet possibly a duplex system of measures, having two units, the one diametral, and the other circumferential, may prove to have superiority over a single unit system.

“That the Most High ruleth in the kingdom of men and giveth it to whomsoever he will.” Hence, I believe that Great Britain is destined to rule Egypt, and the British inch is destined to outrival the French metre.

Thus, in a short paper, I have endeavored to glean a few crumbs of comfort from the recent survey of the Great Pyramid, made with so much skill, and favored with so much success, and published with so much *eclat*, and declared by its author to be so crushing to our “Pyramid theories.” We sought in vain, as we thought, for means to send an expedition to Egypt, and Mr. Petrie not only furnished the means but did our work for us. We feared that our testimony would not be accepted, even if we should succeed in making the survey, and Mr. Petrie has obtained for us the indorsement of the British Royal Society.

We heartily thank Mr. Petrie for his work, and we sincerely desire that he will hasten to join our ranks; for we do not follow in that sombre procession in which he depicts us,* but we are marching beneath a banner upon which is blazoned this motto: ANNUIT COEPTIS.—“He hath favored our undertakings.”

April 30th, 1884.

J. H. Dow.

THE TESTIMONY OF THE SOCKETS AND AIR CHANNELS.

In No. 1, Vol. II of this Magazine, “A Review” suggests a substitute for the computation of socket lines as set forth in a previous paper on the “British Mile.” In that paper the opinion was advanced that a settling of the Pyramid has taken place centering at a point south and west of the king’s chamber and running in a south-westerly and north-easterly direction. “A Review” repeats the opinion, saying, “There has evidently been a settling down of the whole south side of the Pyramid in a westerly direction, the effects of warping, a result that must have arisen from the action of the sun on the southern side.”

* See last paragraph of Mr. Petrie’s introductory chapter.

In the computations that follow this statement a deduction of 3.7 inches for warping is made from Mr. Petrie's measure of the south side, and an additional deduction of 1.3 inches, thus assigning to this side an original length of 9118.9 instead of 9123.9 (pp. 52 and 54).

But the south side measure of 9123.9 given by Mr. Petrie is the length of the socket line or distance between fixed points in solid rock which is still covered with about two feet of pavement. How there can have been any extension of the socket lines, I cannot see, except by abrasion of the sockets or fissures in the rock, of which no evidence has been found on the south side.

In assigning to the south and west sides the same length 9118.9, we come in conflict with the best actual measure yet obtained which shows a difference of 4.7 inches in these two sides. However, equality of masonry sides might have originally existed if the builder had left a margin of 2 to 6 inches between the facing stones and the socket sides, but then the sum of the four sides would have been considerably less than 36500. The following table may be convenient for reference and comparisons:

	Level.	Side of Square	Perimeter $\div 100$
S. E. Socket.....	00.0	9139.871	365.59484
N. W. "	7.1	9128.719	365.14876
N. E. "	11.4	9121.964	364.87856
S. W. "	16.9	9113.325	364.53300
Civil year.....	9.4	9125.000	365.00000
Astronomical year.....	5.6	9131.056	365.24224

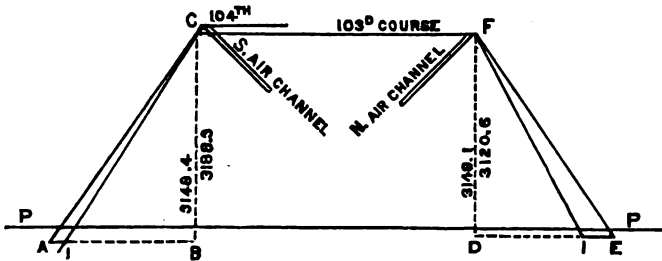
A difference of $\frac{1}{2}$ inch in level makes a difference of .7854 in the length of a side, if the angle of the facing be taken as $51^{\circ} 51' 14.3''$.

It will be observed in the foregoing table that the astronomical year level is very nearly the mean of the S. E. and N. E. socket levels, and originally it was exactly that if the S. E. corner has settled two tenths of an inch.

It may be interesting to note Mr. Petrie's levels of the courses at the N. E. and S. W. corners. By his table the following courses are perfectly level at those points, Nos. 5, 23, 25, 34, 38, 39, 46, 68, 126, 127. The average difference in the lower 13 courses is 2.47; from the 13th to the 145th is 67; in the

upper 56th it is 2.4. Mr. Petrie thinks that the levels of the 1st course show the real error of level in the pavement. The S. W. corner of that course is one inch lower than its N. W. corner. But the pavement at the S. W. corner may be out of level even more than this. We would suppose that more care was taken to level the pavement all around than to level the core courses of masonry. In fact the core courses range from 1 to 5 inches out of level. This was of little importance seeing that they were to be covered with facing stones in such a manner that no courses would be observable.

That a tilt of about 6' in a southwesterly direction has actually taken place, appears to be capable of pretty clear demonstration by the levels given by Mr. Petrie. The following diagram and explanation will show the line of proof.



BIC = 51° 57' 30"	(Petrie)	DEF = 51° 46' 16"
ACB = 38° 4' 4"	"	The mean of } = 51° 51' 5"
BAC = 51° 55' 54"	"	

A, corner of S. E. socket. E, corner of N. E. socket. C, exit of south air channel. F, exit of north air channel. PP, pavement, or zero of levels. II, Mr. Petrie's line of casing stones on the socket floors. AI = 2.4, IE = 7.8.

The problem is to find the mean of the angles BAC and DEF.

Level of south air channel exit at bottom of 104th course, 3148.4
 Level of S. E. socket A., below pavement - - - - 39.9

Level of south air channel exit above S. E. socket, BC, 3188.3
 Angle BIC, (Petrie), 51° 57' 30".

From these elements, IB is found to be 2494.733. To this add Mr. Petrie's margin 2.4 and we have, AB, 2497.133. Hence,

the angle $ACB=38^{\circ} 4' 4''$ and the angle $BAC=51^{\circ} 55' 54''$. By a similar process DEF is found to be $51^{\circ} 46' 16''$. The mean of these two angles is $51^{\circ} 51' 5''$. The tilt is one-half the difference in the two angles, $\frac{1}{2}$ of $9' 38''=4' 49''$. If two-tenths of an inch be allowed for abrasion of socket walls instrumental error, BAC will be $51^{\circ} 56' 3''$ and DEF will be $51^{\circ} 46' 23''$ and the mean $51^{\circ} 51' 13''$, and the tilt would be $4' 50''$, provided that originally the altitude of the north and south sides was the same.

This result seems to confirm the opinion that the facing stones were set close into the corners of the sockets without any margin, and consequently that the time measure of the base sides is not between undefined points on the socket floors but from the very boundary lines of the sockets themselves.

H. G. WOOD.

WHAT IS THE PYRAMID INCH?*

I do not know a more pertinent question; probably none has been a greater stumbling block to our Society since its organization, and none has been the handle of so much ridicule of Prof. Piazz Smyth, astronomer for Scotland, and of all the members of our Society, and many of them, some of the wisest and most technical, the best mathematicians, have succumbed and said that the Pyramid inch is a myth, and that Prof. Smyth would have to recant. He based his whole theory on the assumption that the base of the Pyramid measured 9,140 British inches, and upon the fact that there were certain most remarkable coincidences in time and chronology in the proportions of the Great Pyramid. Assuming that the British inch had become shortened 1,000th part during the last 4,000 to 6,000 years, he declared that the true inch was correlative with the polar axis of the earth, and hence with the measures of the universe, 25 of which should and really did make the cubit of Israel; that the sacred cubit, in contradistinction to the common cubit of Israel, was the Pyramid Inch—25.025 British inches of which

* See page 195, Inquirers' Club.

make the Sacred Cubit of 25 Pyramid inches, and that this was and is the two hundred and fifty millionth of the polar axis of the earth. He claimed that the polar axis, in all probability, is 500,500,000 British inches, and that by lengthening this British inch 1,000th it would exactly agree with the polar axis, so that 50 Pyramid inches would be the ten millionth part of the axis of rotation, and that 25 Pyramid inches would make the sacred cubit of Israel the ten millionth part of the half axis of rotation. It must be admitted that if this be true, there could be no more beautiful, symmetrical and harmonious relation in the universe than such a measure for a standard of length; for there is and can be but one axis of rotation, whilst there is an infinite variety and number of meridians. There is only one other measure on earth that could come near to it as a proper standard, and that is one circular measure, viz.: the equatorial circumference of the earth, unless it be that when a second of arc is symbolized by the inch.

There are, therefore, two plainly marked, unique earth measures which would be adopted by the wise of the earth for a standard of linear measure, viz.: the straight polar diameter and the curved equatorial circumference, unless from certain other cosmical relations, the measure of the earth in latitude 30° should be selected as a correlative, of which I propose presently more particularly to speak. Now, I wish here to go back four years to the publication of my paper on the "British Inch," and before doing so I desire to say that until I met J. Ralston Skinner, of Cincinnati, I was under the impression that Prof. Smyth's theory was correct that the British inch of to-day was the same as that given originally to our race, except that it had become shortened by 1,000th part. Mr. Skinner implored me to dismiss this thought and accept his, viz.: that the British inch of to-day is the original exact length handed down from generation to generation, and preserved, mysteriously, but yet preserved, intact and exact through thousands of years; that Piazzi Smyth's Pyramid inch was a fallacy—had no foundation whatever. I combated Mr. Skinner, and, when we were about to have the chart made, determined to have it constructed in Pyramid inches. So disturbed was he about this that he asked

me as a personal favor not to do it, but to construct it according to the measure of the British inch, with which Piazzi Smyth measured; and I finally consented, and then went to work and convinced myself by writing my paper on the British inch, declaring, however, that the Pyramid inch of Piazzi Smyth would be proven true—a result that I have never doubted. The object of this paper is to endeavor to prove the correctness of that thought and the absolute correlation between the British and Pyramid inches, redeeming a promise I then made, to endeavor to show their relation.

I have been looking in various directions ever since, but never came to any definite conclusion until Rev. H. G. Wood, an Episcopal minister at Sharon, Pa., a valuable member, commenced with his papers upon the "British Mile."

I reproduce here portions of my paper referred to:

EXTRACT FROM PROCEEDINGS PART II., AUGUST, 1880 TO JUNE, 1881, PAGE 102.

It is very plain that the most important, indeed the all-important thing to do in measuring an old monument, is to ascertain the intention of the architect. It is perfectly plain, by examining all of the measures given in the authorities, that there is a small discrepancy, for it is stated that the height of the Great Pyramid is to twice its base as 1 is to π , but when we come to put the figures heretofore given in shape we find that it is so, as close as measurement can prove it, showing the positive intention of the architect, but exhibiting most clearly that we have not found the figures that give the proportion. Now, unless we can give these dimensions to the millionth part of an inch, I shall consider the work incomplete. If this structure be of God it will explain itself to the millionth of a second. Such a test will reveal inspiration.

Without it we have only the bungling work of the common mind.

We shall see as we proceed here how far we may be able to prove by the minute tests referred to, the inspiration of the work.

If the coincidence is not perfect all are at liberty to reject it at once, but if the figures are found to prove to the minutest fraction the assertion made, then I call upon the wise men to take notice.

There are three keys in the Great Pyramid. First, the key of pure mathematics, and if in our additions, multiplications, subtractions and divisions we do not find perfect results, then the key of *pure mathematics* is not found.

The second key is that of applied mathematics, or that which relates to the earth and astronomy.

If the measures do not relate to the earth and to the heavenly bodies, then the second key is not found.

The third key is that which relates to past, present and future history. If the application of the measures in an inch to a year is not proved as related to the history of the race, then the third key is not found.

But if these three keys be found, or if the first one even, viz. : that our British inch is found, what is the inevitable and inexorable conclusion. It is this, that the people who

built the Great Pyramid of Gizeh, were our own forefathers and not idolatrous Egyptians, and that the nation possessing this first key is the British or covenant race.

Now, I propose to confine myself herein particularly to key No. 1, and to all I request, that they make themselves acquainted with the value of π .

I propose in this paper to prove that J. Ralston Skinner, of Cincinnati, has discovered the mind of the architect of the Great Pyramid in relation to the measure used, and that he has absolutely restored the building, as far as he has applied the measure to the original plan to the most minute fractions, and that this measure used is the veritable British inch, in the possession of the Anglo-Saxon race alone.

I also propose to prove that C. Piazzi Smyth, Astronomer Royal of Scotland, the great measurer, has given the theoretical base of the Great Pyramid in British inches, 9,140 inches, upon a certain level from which are deduced the time measures of the Great Pyramid; also that the Pyramid inch is a real thing, but that it relates only to that which is sacred in the Pyramid, hence the sacred cubit, of 25 P. inches, is about one thousandth greater than the British cubit of 25 inches.

I propose to prove that J. Ralston Skinner is correct in his showing that the British measures are related exactly to time and space.

I also propose to show that in forming one scale for measuring the Pyramid, the circle was divided into 360 inches and degrees, and that each degree is subtended by one inch of arc, and that the analytical unit of measure, viz. : 180 divided by π , or 3.14159+, equal to 57.295+, is one of the great keys for unlocking the secrets of the Great Pyramid. And that through this the British inch is made the theoretical unit for measuring the earth and the distance from it to the sun, moon and stars.

In this essay I beg the careful attention of all men, and assert that none, not even excepting the public school children who can add, subtract, multiply and divide, need fail to understand the purport and importance of what I propose to show.

I will take it for granted that I am speaking only to those who know the first rules of arithmetic, and are not acquainted with the terms of mathematics.

Therefore, to begin, I will state that the analytical unit of measure is the arc equal to radius, and is found by dividing 180 by π , and π is simply a term used to denote briefly the proportion of diameter to circumference of a circle, so that if the diameter was 1 inch the circumference would be 3.14159+, or 3 inches and an interminable fraction.

Now, this wonderful number is the angle of 57 plus degrees, the arc of 57 plus degrees or feet, inches or anything else, and the radius 57 plus inches, feet, yards or anything as a measure.

There is no question you will see by what I shall prove that the architect called the arc and the radius British inches; if so, you can see that each inch of the circle of 360 degrees subtends or is opposite to one degree at the centre.

Now, Mr. Skinner has shown that the downward passage from the mouth to the angle is 343.7745+ feet, and that this is diameter to a circumference of 1080, but this downward passage is exactly six times the analytical unit, that is, 57.29575+ multiplied by six equals 343.7745+ (call it feet) and twelve times 343.7746+ feet equals 4125.294+ inches, that is, there are 4125 plus inches in the downward passage. Now, is this the restored measure? and the question is a vital one.

Howard Vyse gives the downward passage to the angle at bottom 4126 British inches; this is remarkably close for so long a distance. One proof of the kind, of course, is not sufficient.

Let us return to the analytical unit; multiply it as degrees, by 60. It gives 3437.745, or three thousand four hundred and thirty-seven minutes and a fraction; and multiplying it again by 60 gives the number of seconds in the analytical unit, or 206264.7+ seconds.

This is a most remarkable number, and plays a most important part in the Pyramid

measures, as shown by Mr. Skinner. It is given in 'Loomis' Astronomy', page 468, as a constant, and it is used for determining the distance to the sun as follows :

Distance to the sun equals 206264.7 divided by parallax of sun multiplied by (radius of earth.)

This being conceded, the analytical unit multiplied by 6 gave the number of feet in the downward passage, and that multiplied by twelve gave the number of inches, that is, 4125.294+

Now multiply 360 by 360 and we have 1296000.

It will be found that this downward passage in inches is exactly equal to the diameter of a circumference of 12960.

Now, 4125.294 is exactly ten times the length of the king's chamber—or 412.5294+ B. inches. Piazz Smyth measured it as 412.55 British inches.

This number is exactly the diameter to a circumference of 1296, and this is 36 in. multiplied by 36 in. or one square yard in inches, and 412.5294+ is 7.2 times the analytical unit of measure. Divide this by 2 and we have 206.2647+ the width of the King's chamber in British inches. Piazz Smyth measured it 206.3 B. inches.

This is diameter to a circumference of 648, and it is 3.6 times the length of the analytical unit.

It is also ten nilometer cubits, as stated by Mr. Skinner.

It seems that one of the meanings of the solid diagonal may be nine times the analytical unit, or 515.66175+, this is diameter to 1620. The floor diagonal, as calculated by length and width, is 461.22 inches.

The end diagonal as measured by Piazz Smyth is 309.4. This, if an exact measure of the analytical unit, 5.4 times is 309.39705+ inches, and is diameter to 972.

Now, the one-fourth of the king's chamber floor length is 103.132+inches.

This is evidently the restoration of the mind of the architect for the granite part of the ante-chamber floor, but it is rendered certain when we find by calculation that it is diameter to a circumference of 324, thus: 324 divided by Pi equals 103.13235. This granite is measured 103.13 inches. And, we notice that 324 is one-fourth of the number of square inches in a square yard, and also is the sixteenth of the characteristic of the thirds in a day; that is, there are 518400 thirds in a solar day, and 324 is the 16th part of 5184.

The limestone part of the ante-chamber floor is measured as 13.24 in. by Piazz Smyth. As the granite part is diameter to a circumference, it is reasonable that this should also be.

In the above I neither accept or reject the value of regular π , or Parker π , but use the latter—viz., 20612 divided by 6561. The propositions are true for any value of π .

This paper, I claim, proves that the British inch is, as stated by Mr. J. R. Skinner, the base of the Pyramid measures, and also that Professor Symth gave the exact theoretical base of the Pyramid as 9,140 on a certain base. Now, where is the Pyramid inch? This Pyramid inch or sacred measure is by no means a myth, and will be the subject of a future demonstration.

Upon this paper I challenge the criticism of mathematicians and astronomers.

NOTE.—Do not fail to examine J. H. Dow's paper of June 7, 1882, in No. 1, vol. 1.

My concluding paragraph was a rather bold one—that I defied any astronomer to overthrow the accuracy of my conclusions. The main and principle one was that the Pyramid base was exactly 9,140 British inches long, and that the height was 5,818 plus inches, thus sustaining Prof. Piazz Smyth; another statement made in that paper—that the king's chamber was

askew—troubled me, and I was rapped over the knuckles by Cockburn Muir for making such a statement. This resulted from my using 229,183 inches for the height of king's chamber, and, although it may be inferentially believed that the distance is there, as Mr. Skinner insists, it was not borne out by the best measures for that calculation.

The base line I evolved from the interior was not accepted by Mr. Skinner, who was committed to $9,167.32$ or $\frac{2400 \text{ ft.}}{\pi}$ or the measure of the French savants and Howard Vyse, and Davison, who give from 9165 to 9168 inches for base. The beauty, however, of the evolution of a base from the interior from the British measure and from the analytical unit measures, of which he himself was a discoverer, pleased Mr. Skinner. This evolution fixed my faith in his accuracy in relation to his theory as to the British inch, which has been strengthened by examination more and more.

My faith began to waver in relation to the 9,140, as I thought that I discovered an error of something more than the tenth of an inch. To many, and, indeed, the majority of mankind, this variation was nothing, but I had started out with the statement that unless my work could be proven to the millionth of an inch it should not be received or accepted. We yet stand by that statement.

I sent my whole paper to Mr. J. H. Dow to critically examine and after some time he returned it and said that no mathematician could overthrow my argument and conclusion. This was very gratifying, but not satisfying, since I knew the error was there, although I did not discover the formula. So I returned it again to him saying that there was an error of a little more than the tenth of an inch—too great. He soon came and said that he could reconcile the whole if I would change the height and base by a very small amount, a little over a tenth of an inch in base. I accepted it at once after examination, and have no reason to doubt but that $\frac{180^2}{21\sqrt{\pi}}$ represents the base named, 9139.-871258 instead of 9140 and that $\frac{180 A}{\sqrt{\pi}} = 5818.62287$ represents the height, and then Mr. Dow's formula for the exterior

of the structure was brought into complete harmony with the interior, all relating exactly to the analytical unit, and to the British inch, and to the circle of 360° as shown by Mr. Skinner. And thus, by getting the corrected height and the corrected base, my paper upon the British inch may be considered as representing the Pyramid measures to the millionth of an inch.

And yet I am inclined to believe that the measure as put in formula by Mr. Skinner, namely $\frac{2,400 \text{ ft.}}{\pi} = 9,167.32$ inches is also indicated as one of the base measures, although the late measures of Mr. Petrie may not show it, but do show overwhelmingly the 9139.871258 or $\frac{180^2}{2 \sqrt{\pi}}$ on level of S. E. socket.

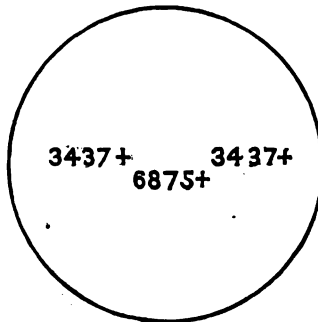
But how it is possible that the French savants, the measures of Col. Howard Vyse and others, could have been in error to the amount of over three feet is beyond comprehension and calls for a careful, re-measurement under the authority of the Society, for the question is vital. But, as I shall show, we are not left in doubt as to the ratio or relation of our measure "the British inch" to the circle of 360° even if the measure 9139.871258 could only be inferred from a greater base and a greater height.

As I said before, the papers of Mr. H. G. Wood upon the British mile turned my attention to a new solution of the Pyramid inch question. It will be remembered that he advanced the theory that the British mile of 5280 feet agreed, or was likely to be found agreeing, with a minute of arc in the latitude of the Great Pyramid or $29^\circ 58' 51''$, or say 30° and the whole matter hinges upon the shape of the earth.

Dr. Seth Pancoast wrote me some time ago "You and Mr. Skinner should go for the coffer."

If the earth be an ellipsoid, then the measure of a mile, 5280 feet on the earth, according to Prof. John N. Stockwell, would be equal to one minute of arc at a point about five miles south of the Great Pyramid; but astronomers are at sea as to the shape of the earth, hence it may well be that Mr. Wood is correct in his thought that the architect of the Great Pyramid placed the structure at a point where, if you measure east and west, you would find that 60 minutes or 1 degree of heavenly arc would

subtend 60×5280 feet on the earth; this is yet to be proven. The arguments from the coffer and the Pyramid are much in favor of the correctness of Mr. Wood's theory. If true, it will be a wonderful and beautiful thing. Let us see how the coffer measures bear out this theory. Mr. Skinner has taken 90 inches for the length, 41.25 inches for the height, 34.37 inches for the depth, 78 inches for the inside length, 27 inches for the inside width. With these measures he obtained the thickness of sides, 6 inches, thickness of bottom, 6.875 or $\frac{21.6}{\pi}$ or one tenth of twice the depth of the coffer. The exterior cube exactly half the exterior to the remotest fraction. This is doubtless one of the solutions of the curious problem of the doubling of the cube. Now it will be observed that the height is one tenth of the king's chamber length in inches, and the depth is the tenth of the downward passage in inches for feet, and the bottom is one tenth in thickness of depth of coffer multiplied by two; that $34.377 \times 2 \div 10 = 6.875 +$ and Mr. Skinner shows that this last number is diameter to a circle of 21.6. Now let us put these measures of the coffer upon a circle :



$$360^\circ \times 60' = 21600 \text{ minutes or miles.}$$

According to Mr. Wood the Pyramid is placed in such a position on the earth that the circumference of the earth on the parallel of latitude of $29^\circ 58' 51''$ equals 21600 English miles or $21600 \times 5280 = 11404800$ feet, or that 1' of arc subtends 5280 feet, or that the proportion is one minute to a mile. Now we

see that if we take 100 times the depth of the coffer for a radius, taking miles for inches, we have the radius of the earth in the latitude of the Pyramid and the thickness of the bottom of the coffer is just one thousandth of the diameter of the earth in latitude $29^{\circ} 58' 51''$, taking miles for inches, or $6875 +$ miles. This is the diameter of the section of the earth in the latitude of the Great Pyramid.

Now this radius 34.377 is also the distance from the north end of grand gallery to the centre of the well, and the king's chamber length 34.377 in feet is the same on the depth of the coffer in inches, and one-hundredth of the radius of the section above mentioned taking miles for feet, and the width of the grand gallery above the ramp is 68.75 inches or ten times the bottom of coffer, and one-hundredth of the diameter of same section of earth through $29^{\circ} 58' 51''$, miles for inches. Now suppose that Mr. Wood is not exactly correct and that the Pyramid is placed from 5 to 8 miles north of that circle of latitude which gives the above proportions. Do not the measures of the coffer, the king's chamber, the ante-chamber, the width of the grand gallery, the distance from the beginning of grand gallery to centre of well all agree with the measure of the circle and diameter of the earth in British miles? When 5280 feet is subtended by one minute of heavenly arc, and which Prof. Stockwell says is, counting the earth as an ellipsoid figure, correct for the circle of about 5 miles south of the Pyramid.

To recapitulate: You take the length of the coffer, 90 inches, square it = 8100, divide it by half the square root of π , or .886,226,925, you have the base of the Pyramid 9139.871258 + British inches. Divide the base by half the square root of π and we have 100 times the length of the granite of ante-chamber floor or 10313.4 British inches. Now divide this last number by half the square root of π and we have twice the height of the Pyramid or 11637 + British inches, or one hundred times the length of the ante-chamber floor, limestone and granite.

Now all of these circumstances prove conclusively the relation of the British inch to the circle of 360° , and the measures of the earth in latitude 30° or within gun shot of it (we think it will be found exactly in latitude of Pyramid), and that these meas-

ures agree with the British mile and the common cubit of Israel, and overwhelmingly coincide with the measures of the interior and exterior of the Great Pyramid.* We ask all to examine and study these premises. Now what remains, since the relations of the British measures are to the latitude of 30° and 360° and space, what relations have these to polar diameter? Certainly there is an exact relation; what is it? We know that in getting the distance to the sun astronomers use 206265, or the number of seconds in the analytical unit and one thousand times the width of the king's chamber, seconds for inches. Mr. Petrie has shown that the distance from the S. E. to the N. E. socket is 9131.055 inches *British*. Divide this by 25 and we have 365.2422 or the number of days in a year. Now the relation between the diameter through the section of the earth in latitude $29^\circ 58' 51''$ is shown by dividing $\frac{9131055}{91399871} = \frac{1}{999}$.

The British inch has a positive relation to the earth as originally intended connected with 360° .

CHARLES LATIMER.

THE PERIMETER OF THE SIDE WALLS OF KING'S CHAMBER.

The π formulæ for king's chamber, given in Vol. 1, No. 1, of Magazine, bring out a wonderful confirmation of Mr. James Simpson's "2d height" of the walls (their height from the bottom of the lower course, which is about five inches below the floor level). It is as simple as A B C, and yet I have been two years searching for it.

Here it is: Let l =length of king's chamber, *i. e.*, $\frac{1296}{\pi}$, let b =breadth, *i. e.*, $\frac{648}{\pi}$, and let h =2d height. Then, by Simpson's rule, $l+h=\pi b$. Multiply both members of this equation by 2, $2l+2h=2\pi b$. Substitute the π value of b , and we have $2l+2h=2\pi(\frac{648}{\pi})=1296$. But twice the length plus twice the height is the circuit of the wall, hence:

* See Mr. Wood's papers in former numbers of the Magazine.

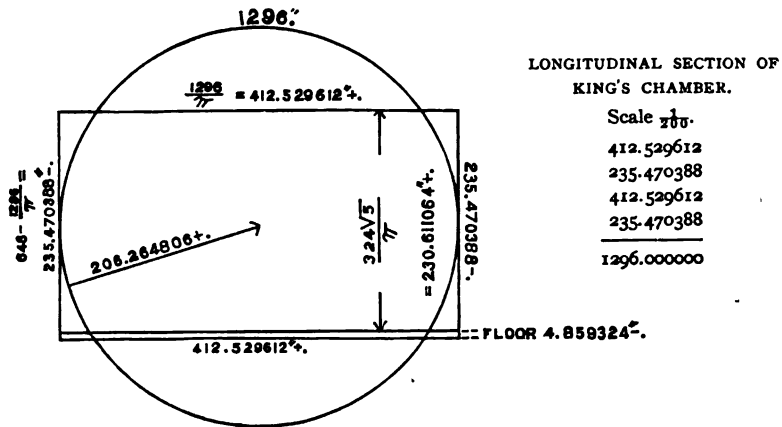
1st. The circuit of each side wall of the king's chamber measures exactly 1296 British inches, and, as Prof. Smyth states in 'Our Inheritance,' the length of the wall is diametral to the circuit.

2d. The circuit of the side wall represents, on a scale of $\frac{1}{1000}$, a circle whose circumference measures one British inch for each second of arc, and whose radius is exactly 10,000 cubits (20.626.48+ inches); showing thus the correlation and common origin of the inch and this primitive secular cubit.

3d. The circle of 1,296,000 inches in circumference indicated in the king's chamber suggests the probability that the double accent mark (") which we now use to express both inches and seconds of arc, may have been used for both purposes 4,000 year ago. If so, the hieroglyphics over the ancient entrance to the Pyramid, which were interpreted to Herodotus to denote onions, radishes and garlic, may really have been our identical degree (°), minute (') and second (") symbols, as some writer has already intimated.

The 2d height is obtained numerically by simple subtraction, $648 - 412.529612 + = 235.470388 -$.

It may be of special interest also, that π times the diagonal of side wall is $1492 +$.



I wish to add here, with emphasis, that the British inch, however firmly it may be established, will not necessarily crowd

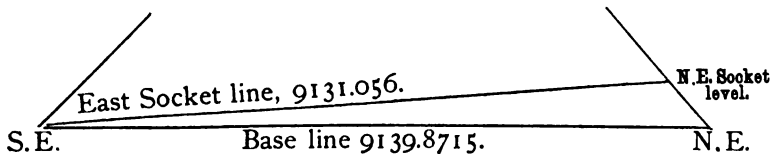
out the Pyramid inch. I am beginning to think that the British inch is intended mainly as a legitimate secular measure, but the Pyramid inch is the unit of sacred measure, and that the two units are related in the ratio of 9131.055 to 9139.871258.

When we shall have arrived at the full interpretation of the Great Pyramid, I am convinced that Prof. Piazzzi Smyth will have less to retract from earlier theories than any other Pyramid student.

J. H. Dow.

PROFESSOR SMYTH'S PYRAMID INCH.

According to Mr. Dow's theory, the geometrical base line of the Pyramid at the level of the S. E. socket is 9139.871258 British inches. Taking Mr. Petrie's measure, 11.4 for the difference of level between the S.E. and N.E. sockets, the east socket line, according to the π theory of slope, would be 9130.89 inches and 365.2367 for the astronomical year. But if we take 11.22 as the original difference of levels, we shall have 9131.056 for the length of the east socket line, which would give 365.2422 for the astronomical year, in accord with the π theory and Mr. Dow's base line of 9139.871258.



I suppose it will not be doubted among Pyramid students that the east socket line, 9131.056 British inches, is a measure of the astronomical year. Now, if we would find a measure of that year in the true geometrical base line of the Pyramid, the unit of measure must be somewhat longer than the British inch, which measures the east socket line 9131.056. How much longer may be found by dividing 9139.871258 by 9131.056? The quotient is 1.000965. Therefore, the geometrical base line 9139.871258 represents the astronomical year just as correctly, if we use 1.000965 British inches for the unit measure, as it is represented

by the east socket line in British inches. We may call this slightly lengthened unit of measure a Pyramid inch if we please. Professor Smyth's Pyramid inch is 1.001 British inches. The difference between this and a Pyramid inch obtained from Mr. Dow's base inch is $1.001 - 1.000965 = .000035$ or 1-30000 part of an inch. We may truly say that Professor Smyth's Pyramid inch, 1.001, is the astronomical year unit of measure on the *base line*, and Mr. Dow's British inch is the astronomical year unit on the east *socket line*. Strictly speaking, the Pyramid inch of the base line is 1.000965 British inches, but for practical purposes of building it might be taken as 1.001, as the error, 1-30000 arising from the unit of measure could not be detected by instruments.

H. G. WOOD.

SUGGESTIVE NOTES ON PYRAMID MEASURES OF
MR. PETRIE AND OTHERS, FROM LETTERS
OF J. R. SKINNER TO MR. LATIMER.

FROM LETTER I.

From the exceedingly important and grave aspect which the Pyramid studies are taking with me, I feel impressed to write again upon the subject. You know how very careful I have always been in my investigations, so much so that I have never suffered a haphazard or catch idea, however fascinating, to go forth, but have confined myself strictly to ascertained reliable measures and angles, to obtain their solution in architectural design, if possible. "Catch your rabbit first and then cook it." Show the exact measures first and then test their probable application. The sun's distance is really a disputed quantity by some 500,000 miles, among the greatest authorities; the earth's diameters by some 500 or 600 feet, say 1,000; the elements of the precession of the equinoxes are not as yet determined. By some the earth's shape is a variable, and by some the time of the lunar periods and the earth's yearly passage is a fluctuating measure. Therefore every one can find a support for this or that calculation, and is tempted to warp a real structure, as is the Pyramid, to suit a value or series of values,

as yet indeterminate, so as to make them fixed as standards. The result is confusion worse confounded. To a certain extent I believe we are agreed on certain definite standard data:

1. The British inch.
2. The N. cubit value taken from radius seconds of the circle of 360° .
3. The use on the Pyramid of these in a system of diameter measures exhibiting or indicating circumference values.

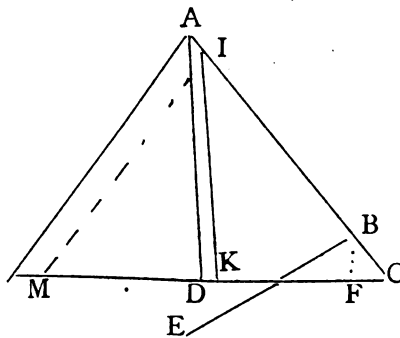
Your acceptance of a series of these measures has been in finding them applying in so many coherent and interrelated ways as to prove, say, incontestably their existence. These measures, so accepted by you, have been found in the upper and interior parts of the Pyramid. The lower part, that is especially the descending passage way, you have purposely avoided committing yourself upon, though in full harmony, correlation and coherence with the upper works, because of the uncertainty of the length of the base side, a matter still in question by a comparatively large measure of some 30 inches or $2\frac{1}{2}$ feet, a confounding discrepancy for an exact work. I assent to this as the right course for you and the Society. But for myself it has been otherwise. All the upper measures had to grow out of this lower one of the descending passage. They developed out of its location and measures, on the π modulus, so that all formed one harmonious whole and many details in a just and inter-related symmetry. Moreover this descending passage was found to point to a most singular relation with respect to the *ground level*, or base of casing stone; for the foot of the passage was found to be 100 British feet or 1,200 inches in vertical depth below that level, which indicates a circumference to a diameter of $381.\underline{921}\pm$ inches, while the half distance between sockets in length shows to be $381.\underline{921}\pm$ feet, or a diameter to a circumference of 1,200 feet. The exceeding harmony of these data, taken as they were to conform to actual reported measures, having the highest praise of those whom we esteem authority (among them especially Piazzi Smyth) has been sufficient to make me morally certain that they would finally grow into the approval of the Society.

I have not seen not read Mr. Petrie's book, for I have been

till within a short time exclusively occupied with my Hebrew Bible reading. But I have become greatly interested in some of his measures, as noticed by Mr. Beswick, and which I have already referred to in my last to you. As to the descending passage way: If you will refer to page 132 of 'Source of Measures,' you will see how I made use of Vyse's and Smyth's measures down this passage to find a coinciding objective point with them. Smyth commenced at the edge of *basement sheet*, and measured down 162.3 inches, which length referred to the roof gave Vyse's starting point. Smyth measured down from A' to C', a distance of 981.9 inches to the junction of the roof line of the ascending passage, and he made the distance back from C' to O, or the edge of the break-out 60.0 to 60.3 inches, say 60.2. Then from B, Vyse's starting point, to O is $981.9 - 162.3 = 819.6$ and $819.9 - 60.2 = 759.4$ inches. Vyse gives for his measure down to this break-out 758 inches. I took it, therefore, that the edge of this break-out characterized these two measures, viz., of 759.4 and 758, of these two, the chiefest, measurers in and about this structure. The difference I took to be explainable by the ragged edge either of the break-out or the basement sheet. With this foundation and the vertical height of basement sheet above the ground level of 49 feet by Vyse ('Source of Measures,' page 116, foot of page) and Smyth's angles, I made use of Vyse's continued measures, and his restoration of the dilapidated casing to see to what extent either the Turin or the Nilometer cubit measure from the *modulus* would apply. Vyse gave the total as "about 4126 inches." I made it $2062.647 \times 2 = 4125.294$ inches, or just 200 Nilometer cubits, or ten times the length of the king's chamber, but in time measure it was twice the *radius seconds* of the circle of 360° . In feet as 343.7745 it was diameter to a circumference of 1080 feet, while as 3437.745 minutes it was radius minutes of the same circle, and also 34.37745 inches was the inside depth of the coffer. Also, if you add to 343.7745 its 1-9th, or 38.1971, you will have $381.971 +$ feet, which I still hold to be the measure in length between the sockets, of N. base side, on the authority of the French, of Vyse, of the Sultan and of Piazzzi Smyth. I am thus particular for this reason:

It is now placed beyond question that the angles of the sloping side and of the descending passage way are to all intents identically the same with all measurers, as nearly as any two competent men can give them as the mean of his best efforts. That which is desirable is to determine the angle architecturally made use of; and this can be had from a knowledge of the plan from which the architect wrought. John Taylor, we are satisfied, recovered this as to the elements of the shape of the mass. The location of this passage way with its length of 4125.290 inches, so as to give the bottom of the passage a vertical depth of 100 feet or 1200 inches below the base of casing stone, and a vertical height above this base for the outer and lower lip of the descending passage of thirty-one T. cubits or 638.97+ inches, restores the angle as $26^{\circ} 28' 24.10''$ which is in contrast with one of Smyth's as $26^{\circ} 28' 17''$, I believe. Now Mr. Beswick quotes Mr. Petrie as fixing this vertical height above the ground level, of the outer and lower lip of the descending passage as 638.4. I think he mistakes as to Mr. Smyth, for I think Mr. Smyth never has made an estimate of this height, at any rate to my knowledge.

Thus, then, if we have given to all intents a sameness, (1) as to the angle of the sloping side, (2) as to the angle of the descending passage way, and (3) the vertical height of its outer and lower lip above the ground level, with the wonderful measure applying to Col. Vyse's recovery of the length of "about 4126 inches," viz.: 200 N. cubits of 4125.294 inches, then we can say that we fasten the construction as follows:



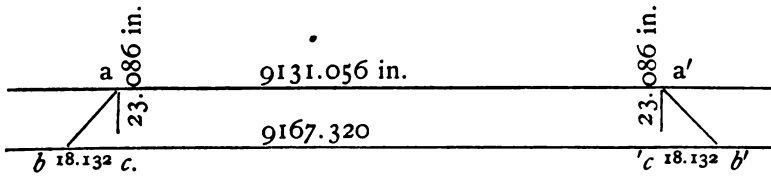
angle ACD fixed; angle EBC fixed; location of EB as

to angle, and intersection of AC in B, fixed. But on this location of EB all the upper interior works *are shown to be in essential location* constructed. *Therefore*, all this work as I have shown it in the Crown Jewels, can be and must be taken as the conception of the architect by his measures, *no matter what may be the measure of the base side*. For, if you determine that base side to be 9131+ inches long, and desire to show this from the above plan, you would accomplish this in effect by shifting the vertical axial line AD to IK, making your vertical section of the entire Pyramid CIM with the base desired, *leaving all the interior work exact and in position* with the exterior slope line.

I have tried to be plain, and think you will see the truth of what I have advanced if you will but give the matter a little thought.

You know I have always thought that Mr. Smyth's 9131+ measure is in the Pyramid, but not as he takes it, viz.: as the mass of the symbol itself, which would symply indicate *sun worship*. I showed you and wrote him how this is shown, and in a much more perfect way than he or any one has shown, of those who are so twisting and racking Mr. Petrie's measures to squeeze even an approximate neighborhood to the value of 365.2422.

The heights of the ramp of the grand gallery are given by Mr. Smyth as a *mean* of 23 inches, on which you can take the measure of 23.086+ inches. The ramp, by my plan, abuts against *the vertical axial line of the Pyramid*. Then a little pyramid with this height will have a base of $18.132 \times 2 = 36.264$ inches. Refer this down to the base, as if you would slide it down there, and it will cut out this from the length of the base side, cutting through the foot of the axial line. Now I say the base (of the north side) is 9167.320 inches long. From 9167.320 take 36.264 and there remains 9131.056 inches, four times which is 36524.224, showing 365.24224 or the tropical year value. Now suppose this same thing was shown by the *pavement covering a portion of the foot* of the base:



a and a' are the points of contact of pavement with sloping side. The bases bc and $b'c'$ equal each, 18.132, or together 36.264. Then the base line of the Pyramid indicated by the top of the pavement would be 9131.056 in. I took the thickness of this pavement as one T cubit, because Vyse gives it as about twenty-one inches. Still it might at *some other point* or in some other way show a depth of 23.086. *I only give it to show a possibility.**

This whole matter has become with me of greater importance than ever, because I find this Pyramid and its measures to be *the burden of the Hebrew Scriptures from the beginning of Genesis through the books of Moses and the entire Bible in fact.* This I can show beyond question and have it down as a reading of Scriptures. This reading is as perfect and coherent in its way as Crown Jewels is in its.

The symbol running through the whole is this great Egyptian Pyramid. This is the reason why I hope you may be led to look more closely than ever into the merits of the construction of the Pyramid by the *modulus measures*, for the matter gets all its superlative importance, in the way of Biblical exegesis, from this modulus.

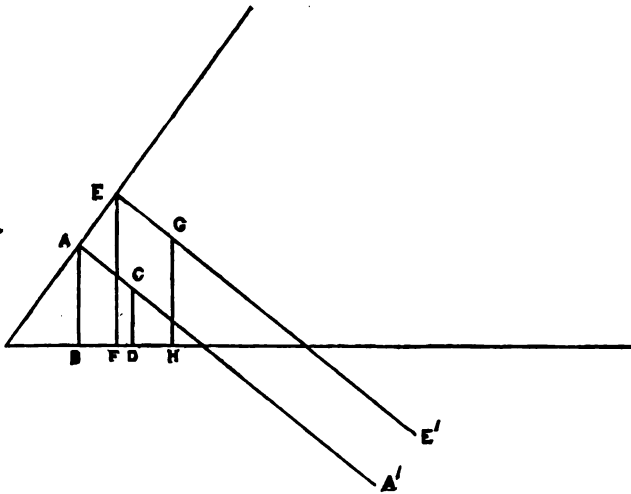
I am indeed glad and thankful that the measures under the modulus are obtaining such strong recognition, as *ex. gr.* Bes-

*NOTE.—Examination of Mr. Petrie's work brings out a novel idea as to this matter. We have been led by Mr. Smyth into the error of including *the thickness of the pavement* in the mass of the Pyramid. To the contrary, the Pyramid is constructed *on the surface of the pavement* (see 'Great Pyramid' by John Taylor, p. 13), which Mr. Petrie gives as from 22 to 27 inches in thickness: In his levelling for height of edge of basement sheet, it would seem that he started from *base of pavement* and not from its surface, making the height 611.2 inches. Vyse measured from *surface of pavement*, or base of casing stone, making the height 588 inches. The difference would be the thickness of pavement or 23.2 inches. The thickness of 23.085 inches would reconcile all conflicting claims, making the base proper of Pyramid on surface of pavement 9131.056 inches long, while an ideal projection of the slope line through the pavement that depth would give, between socket corners, the distance of 9167.320, as per Vyse and others.

wick on page 48 of the Magazine. Mr. Smyth himself seems to be yielding, and Bexendell now works in terms of British inches. I tell you there lies the basis of a revolution of thought in this matter.

FROM LETTER II.

Mr. Petrie has had to accommodate the interior to his exterior structure, and has run the vertical axial line of the Pyramid down through the apex of the queen's chamber.



AA' and EE' represent *about same* length of floor line of descending passage-way by Vyse and Petrie, 4126 and 4143, with nearly the same angle. The upper edge of basement sheet is *common* to both, and is represented by c for Vyse and G for Petrie; AC by Vyse is, say, 113.8 inches; EG by Petrie is 124.2 inches; AB by Vyse is 638.9; EF by Petrie is $668.3 + 21 = 689.3$. Now CD the vertical height of edge of basement sheet, is 49 feet above ground level (21 inches under face of pavement). GH , *the same line* as CD , is by Petrie 611.2 inches *above surface* of pavement, or compared with Vyse's measure GH is $611.2 + 21 = 632.2$ inches in vertical height. Or, relatively, the point c by Vyse is removed by Petrie to G , at a verticle height over c of $632.2 - 588 = 44.2$ inches *or nearly 4 feet*.

The masonry courses are changed so that whereas by Vyse *c* is in the lower edge of the 16th course (your chart counting the lower course as 2 in 1), *G*, the same point, is two courses higher up by Petrie.

Now the pavement before the basement sheet was laid bare by Vyse, the thickness of the pavement was before him, and all plain levelling work to obtain the vertical height of the point *c*, which he gives as 49 feet, or 588 inches.

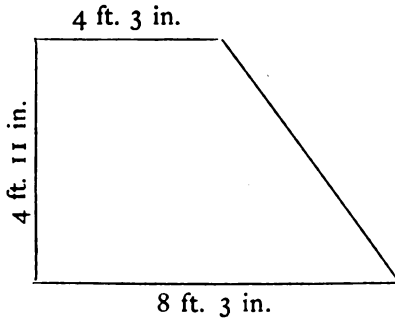
Can it be that Vyse and Smyth have blundered so monstrously as this? $44\frac{1}{2}$ inches or nearly 4 feet in this small altitude?*

I have examined Mr. Petrie's measures with care. As to the interior they serve practically to verify those of Col. Vyse and Professor Smyth, but as to the exterior they are manifestly worthless, and by his own showing make the length of the base side *longer* than do either the French or Vyse.

The data to show this are as follows:

He gives us the professed exact dimensions of the *core masonry* or base sides of the existing dilapidated mass. These were also given by Davison, by the French and by Vyse. As to the latter, Mr. Davison gave the measure of the present north base side as 746 feet, the French "having measured the apparent base of the Great Pyramid twice, viz., from east to west and from west to east, with a good measuring chain, receding for that purpose one hundred feet towards the north, but still keeping on a line parallel with the base, M. Jourard found the length of the Pyramid from one visible angle to the other to be 745.8 English feet," and Col. Vyse measuring the same, found it to be 746 feet, or as he calls it, "the present base." This is the north side of the "core masonry" of Petrie, and is 8952 inches. Col. Vyse found a casing stone *in situ* set up to this core, on the north side with the following dimensions as given, viz:

*NOTE.—Explained and conflicting measures reconciled in preceding note.



Thickness at bottom 99 inches, at top 51 inches, height 59 inches. Mr. Petrie follows Vyse as to general description, and gives the dimension as, thickness at bottom 108 ± 8 inches; at top 62 ± 8 inches; height 58.85 inches; and we may take these respectively, as net, 100, 54 and 58.85, which practically give Col. Vyse's measures.

We now want the "core masonry" of Mr. Petrie, that is, what are we to understand by the term? On examination we find that he intends by this term "the present base" of Col. Vyse, the French and Mr. Davison. He says: "The form of *the present* rough core masonry of the Pyramid is capable of being very closely estimated." Then giving his means, he states his results as follows: "Case plane sides, N., 9002.3; E., 8999.4; S., 9001.7; W., 9002.5; inches. Socket sides, N., 9129.8; E., 9130.8; S., 9123.9; and W., 9119.2 inches." He gives a mean of arriving at the same result in another way, and by a more detailed method, shown in "Plate X," where for "the core plane on pavement" for the N. side, he gives: N. side of Pyramid base, on the level of the surface of the pavement, 9069.4 inches. Deduct from this 29.4 inches on the E. side, and 27.7 inches on W. side, or together 57.1 inches and there remains for length of present rough core plane 9012.3 inches. It is true this differs from the above same measure by 10 inches, but it is nevertheless Mr. Petrie's arrival to practically, by him, the same measure of the same length, by another co-ordinating process. To show this, he gives E. side as 9067.7 inches, with $22.4 + 23.1 = 55.5$ inches to be deducted, leaving 9012.2 inches; S. side 9069.5 inches with $35.5 + 32.3 = 67.8$ inches to be deducted, leaving

9001.7 inches for core side length, which in this instance agrees with the result of the same measure as above given. The W. side he gives as 9068.6 inches, with 36.1 to be deducted, leaving 9032.6 inches for core side. Thus, there is no mistake as to the meaning of the term "core masonry" and the measure given of it. It is the *present existing* base, identical with that measured by Col. Vyse. It is "the present rough core masonry" of Mr. Petrie.

Now being such, and the north side being 9002.3, or 9012.3 inches, then this exceeds the measures of the same length by Col. Vyse, viz: 8952 inches, by 52.3, or 62.3 inches. But if we add the thickness of the casing stone, or 100 inches, twice to this, we will have as the restored length of N. base side 9202.3, or 9212.3 inches, or 766+, or 767+ feet, as the proper result of Mr. Petrie's measures.

It is well enough to quote from his work as to the mode of obtaining one of the above groups of results. He says: "The form of the present rough core masonry of the Pyramid is capable of being very closely estimated. By looking across a face of the Pyramid, either up an edge, across the middle of the face, or even along near the base, the mean optical plane which would touch the most prominent points of all the stones may be found with an average variation at different times of only 1.0 inch. I therefore carefully fixed by nine observations at each corner of each face, where the mean plane of each face would fall on the socket floors. On reducing these observations to give the mean form of the core planes at the pavement level, it came out thus: Case plane sides, (given above); socket sides, N., 9129.8; E., 9130.8; S., 9123.8; and W., 9119.2 inches."

If one reflects a moment, he will see that this line so sighted, passes over the *present* "prominent" edges of the core masonry, and being projected to the socket faces or floors, gives, as by Mr. Petrie, a length of this line for the N. side of 9129.8 inches. Now this is the line of the entire width, or length of the restored Pyramid by Mr. Petrie, being some 30 inches *within* the lines joining the sockets, reducing the measures from 9159.8, say, to this 9129.8 inches.

So far this is all very plain work, but for exactitude it involves

a remarkable and strange omission, which it is almost incredible that Mr. Petrie should have made. It is this: On referring to the diagram above of the casing stone, it is seen to have a flat top of some 51 inches in depth or thickness horizontally. Now *after the first* course of masonry the casing stone of each succeeding course would be brought out to overlap this 51 inches, *but as to the first course* itself, the core masonry of the Pyramid *would be increased* on each side by this 51 inches, and the points over which Mr. Petrie sighted were 51 inches inside of the true position for the plane which he sought. This is true, I think, and seems to be the inevitable conclusion to which one is driven on the examination of Mr. Petrie's descriptions.

Now let us analyze the measure of the core masonry side by Mr. Petrie, as compared with the measure of Howard Vyse. The latter gives it as 8952 inches, and to this is to be added the 51 inches of top of casing stone, and then the excess of 99 inches, the bottom of the casing stone, over 51 inches, or 48 inches to complete the extension of the restored base for each side; that is, 51 taken twice, and 48 taken twice. Suppose Mr. Petrie saw the necessity also, but instead of adding $51 \times 2 = 102$ inches for the *extended* core masonry, which he really had in contemplation, he, by mistake of omission, only added it *once* to Col. Vyse's measure, making $8952 + 51 = 9003$ inches, which is Mr. Petrie's actually given measure. Here we see the measure which Mr. Petrie really gives, and at once have the key to his confusion. He really was confirming the measures of the existing present base, or core masonry, as by Vyse and others; and then, in his attempt to make the core masonry measures by the flat top of the casing stone, he *omitted to add it twice* for the casing stone on each of two sides. So he increased Vyse's measure 8952 inches by 51 inches, giving his result of the length of the core masonry on the N. side, viz., 9003 inches, whereas he should have added just double this, giving the restored core as 9054 inches. With this new and correct idea of the extension of the core masonry by the depths of the flat tops of the casing stones, his sight lines or planes projected down on to the socket floors would simply have restored Col. Vyse's measure, or 9168 inches; that is, it would result in add-

ing to the core masonry, on each side, the excess of the length of the bottom of the casing stone over that of its top, or of 99+ inches over 51 inches.

This is the main blunder made by Mr. Petrie, but it is fatal to his work, both as to length of base side, as also to his carefully elaborated closing of the mouth of the descending passage way in the thickness of the 19th course of masonry. Indeed, as said, it renders Mr. Petrie's work as to the exterior of the Pyramid worthless.*

J. RALSTON SKINNER.

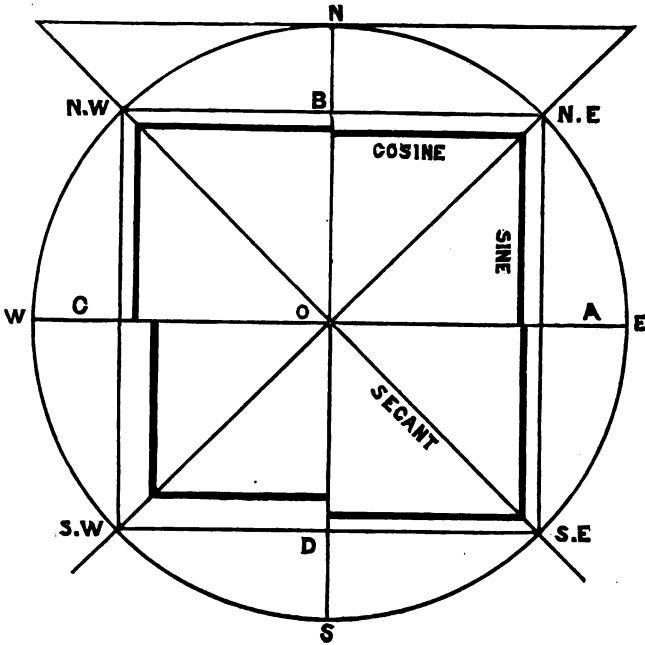
THE STRUCTURE OF THE BASE.

Perhaps the most interesting portion of our review of Mr. Petrie's book will be found in the present culminating article. Having considered the general structure of the base, and the probability and certainty that the architect plotted it and laid it out theoretically on the solid rock, as a sort of trial square, where he proposed to erect his pyramid, we may now consider what that general plan would be, which would form a working plan for the builders themselves, and yet embody all the leading features of the future edifice.

What was that general working plan plotted on the spot where the great Pyramid was to be built? It was neither more nor less than a trigonometrical arrangement of sines, cosines, tangents and cotangents, such as is always used in our common

*NOTE.—On working out Mr. Petrie's measures of the descending passage, and to the intersection of the ascending passage, his own data show a *necessary shortage* of 18 inches on 4143, by which he makes the passage length 4125 inches, which is the same with Vyse. This effectually breaks up his theory as to the 19th course of masonry. This being the fact, both have the same measures and the same angle for this passage. To this is to be added the mode of reconciling the "height of basement sheet," as 588 by Vyse and 611 by Petrie, as shown in preceding note. Then follows the correction of the error of Smyth, viz.: that the Pyramid proper was built *on the surface* of the pavement. By this the "between sockets" of Vyse, being 9168 inches, marked the limitation of the pavement, *on which*, and 18.132 inches inside the socket line, the Pyramid proper was erected with a base line of 9131.022 inches. This would serve to reconcile all conflicting claims of measures, and give a basis for a satisfactory solution of the conflicting statements as to core masonry and casing stones.

text books on trigonometry, and which was probably used by the geometers of the ancient schools when the Pyramid was built, as is exemplified in Euclid's 'Geometry.'



We have embodied this working plan in the above diagram, which every geometrician will recognize at once as a trigonometrical plan of sines, cosines, etc., known as the trigonometrical circle, which is divided into four equal parts by two diameters, perpendicular to each other, and each part is a quadrant. Now the trigonometrical square within the circle is an exact representation of the actual Pyramid base, as deduced from the measurement of Vyse, Ordnance Survey, French Survey, Smyth and Petrie. The latter gives a diagram, Plate X, identical in all its main features with the one here given. Our diagram is in fact, a rough sketch of the working *plan* of the builder of the great Pyramid, showing, very exclusively, that the architect designer or builder used such a system of arcs, sines and cosines in the erection of his building.

Of course, the proof would have to conform to all the requirements of his working plan. And it does conform and agree in every respect. The main feature would be that the core masonry would run out its sides at right angles, forming a system of sines and cosines; each quadrant having its own distinct system. And in such a case the S. E. quadrant would be the initial one. In this case all the quadrants have different sines and cosines, and the core masonry would have four irregular angular points in the middle of each face of the Pyramid, at A, B, C, D. Each face of the core masonry would have a sunken joint in the middle, or hollow at that point of junction. And as the finished faces would be perfectly level, smooth, and having no irregularity or unevenness on the surface like the core masonry, the casing stones on each face would be thicker at its joint on one half of its four faces, and thinner on the other half. On the other hand, if the four sides of the core masonry had been formed of sines equal to the cosines, then the sides would have been equal and form a perfect square, with casing stones of equal thickness all round.

But in the case of the Great Pyramid, the casing stones would begin to be suddenly thick and thin at these middle points at A, B, C, D. In other words the N. E. quadrant would have a thicker casing than the S. E. and N. W. quadrants, and the S. W. casing would be thicker than the S. E. and N. W. quadrants. The thicker casing would belong to the N. E. and S. W. quadrants, and the thickest casing of all would be in the S. W. quadrant. To a person not understanding this structure, the core masonry would have the appearance of being hollowed out at the middle of each face, with thicker casing stones at the middle to fill up the alignment of the face with the corners and angles of the Pyramid.

Now this is actually the case with the great Pyramid. Mr. Petrie detected this fact without knowing its cause, or detecting its significance. The following is what he says, p. 43:

“At the corners, however, the casing was thinned, averaging but 33.7 (difference of core plane and casing on pavement), and this is explained by the faces of the core masonry being very distinctly *hollowed*. This hollowing is a striking feature; and

besides the general curve of the face, each side has a *groove specially down the middle of the face*, showing that there must have been a *sudden increase* of the casing *thickness down the middle*. "The object of such an extra thickness down the middle might be to put a specially fine line of casing carefully adjusted to the required angle on each side, and then afterwards setting all the remainder by reference to that line and the base."

This is a demonstration of our discovery of the true form and significance of the Pyramid base. But it is evident that Mr. Petrie could not understand it, and did not detect the true cause and significance of the hollowing and grooving of the core masonry, and the sudden thickness of the casing at the middle of each face.

From the base we may now go to the general structure of the Pyramid. If this form of base be admitted, the trigonometrical centre of the sines and cosines would be the vertex of the circle, and the radius would be the origin of angles whose vertices meet at the centre of the figure. This brings us to the conviction, that the vertical axis is in the centre of the general figure, otherwise the sines and cosines of the sides would be untrue and unreliable. The whole Pyramid, through all its courses, will bear the same relation to the vertical axis and sides, because every course will practically consist of the same combination of sines and cosines, with the groove in the middle of each side.

A careful inspection of the top of the Pyramid by Mr. Petrie has demonstrated this theory of the upper courses, as clearly as with the lower and lowest courses near the base. Mr. Petrie says: "The top is, rather strangely, not square." And the casing here also must have been thicker on the S. W. and N. E. quadrants than on the S. E. and N. W. quadrants. But Mr. Petrie did not discover the cause of this singular arrangement.

By way of illustrating this trigonometrical plan of the Great Pyramid base, and for the special purpose of giving it the most obvious demonstration beyond the reach of suspicion or doubt, we will take Mr. Petrie's own figures as data. He says the axis of the Pyramid trends 5' 16" from the true north, p. 38, and on page 41 he refers to his own dia-

gram, Plate X, which is almost identical with the one we have given above, in the following words: "The main skew of the core to the base is 1' 33", and its mean azimuth—5' 16" to true North." With this deviation the sine of the N. E. quadrant will be lessened by that amount, and the cosine also, and the break in the line must of necessity be made at B in the middle of the base-side, where the N. E. cosine ends and the sine vanishes. The break could not happen anywhere else, the hollowing groove could not be made anywhere else, if the base is constructed according to trigonometrical principles. The line might have been a straight diagonal line without any break or hollowing groove anywhere. But the hollowing groove and sudden angle in the very middle of the line, where the cosine touches the northern axis, proves beyond all doubt or cavil that the *two halves* of the north side of the Great Pyramid have been constructed and planned to represent the cosines of a trigonometrical square, which has been divided into four quadrants. And as the cosine is diminished by a trend of 5' 16" west of north, the length of the N. E. side will be equal to the value of the cosine in the N. E. quadrant, and will there end exactly in the middle of the north side of the Pyramid.

Let us now test this theory with Mr. Petrie's data. The N. E. socket and corner is 11.4 inches higher than the S. E., with a trend of 5' 16" to the west. This would give a line of $\frac{9130.8}{2} = 4565.4$ inches for the eastern half of the north side.

The western half, with a socket at the N. W. = 7.1 inches high would be $\frac{9128.8}{2} = 4564.4$ inches, making a total length of

Eastern half, 4565.4 cosine.

Western half, $\frac{4564.4}{9129.8}$ cosine.

This is exactly the length of the north side given by Mr. Petrie.

So with the S. E. and S. W. halves of the south side of the base. Mr. Petrie says the axis trends 4' 58", which will lessen the sine and cosine of the S. W. quadrant to that extent. The S. W. half of the side, with a socket 16.9 high, will be $\frac{9118.9}{2}$

=4559.45 inches in length, and the S. E. half will be $\frac{9128.9}{2}$
 =4564.45 inches in length, making the total length of the
 south side 9123.9 inches. This is the length given by Mr.
 Petrie.

Now comes a *test question*. On the supposition that these two sides, north and south, are actual straight lines, as Mr. Petrie supposes in his calculation of the sides, how is it possible for the length to agree with the hollowing grooved character of the middle of the core masonry, except upon the supposition that the sides of the core were the actual sides of a quadrant, which were increased and diminished by regarding them as lines and cosines of that quadrant; and by making the sides of the two halves even with filling the lower half with thicker casing stones? Hence, Mr. Petrie is compelled to come to the conclusion that the core masonry is askew with the true base. He says: "The main skew of the core to the base is 1' 33", and its mean azimuth—5' 16" to true north," p. 41. And on Plate X, with the diagram of the base as computed by him, he says: "The *azimuths* of the sides stated are from the *mean azimuth* of the casing on pavement, which is—3' 43", *i. e.*, W. of N." But his pavement level has an unknown quantity of probable error in it that makes it unreliable. He says, p. 42: "The pavement levels, excepting that on the N. side below the entrance, are not of the same accuracy as the other quantities; they were taken without an assistant, merely for the purpose of showing that it really was the pavement on which the casing was found to rest on each side." The core-plane on pavement, as given by him, has, therefore, an unknown quantity of error in it. And this item, which ought to have been the most completely established as the zero and datum line of all the levels in the upper courses of masonry, is the least reliable, according to his own showing. We have no doubt that the mean azimuth of the casing on pavement was exactly the mean azimuth of the whole Pyramid, namely, 5' 16", west of north, or more correctly, 5' 12.525", as we have estimated it, no matter what the main skew of the core to the base might be. It is altogether inadmissible to suppose, as Mr. Petrie does,

that the architect and builder would adjust correctly the casing to the core masonry to make a perfect alignment and smooth face to each side, and do it with the utmost perfection and finish, and not adjust the casing and pavement level with equal alignment, perfection and finish. His diagram is therefore faulty and erroneous in the azimuth of the casing on the pavement. If the corner sides of core masonry were constructed as the two sides, sine and cosine, of a quadrant, as we have already proven, then it would have been next to an impossibility that the mean azimuth of the casing on the pavement could be what Mr. Petrie has given to it. We cannot for a moment admit it; and the more so because he admits that the pavement level on the N. side below the entrance was more accurately taken by Col. Vyse. The fact is, Mr. Petrie had no reliable formulæ to rest on as a guide and key to unlock the mystery before him, and to control his calculations. For this question of base, datum line, zero of levels, or foundation of the great structure, has been with him a matter of speculation rather than actual observation or measurement.

Indeed, this theory of the true trigonometrical structure of the Pyramid base is capable of the most exact demonstration, and of the widest and most fruitful illustration. Its discovery will enable us in future to employ a system of triangulation of a different character, such as has not yet been applied to the Great Pyramid. And I would recommend that the Institute organize an expedition for that purpose at as early a date as possible. I am now certain it will be impossible for that expedition to fail doing more satisfactory work, for the settlement of difficult points and theories, than any yet done. It can be equipped with perfect formulæ for its guidance, such as no other has ever yet possessed. We have the advantage of having tested them by comparing the results they give us with what has been done under the most favorable conditions, with the best appliances, and directed with admirable precision and skill. And we have found those results more reliable, because nearer the best averages, than any results yet attained. We have the advantage of knowing beforehand what the average positive success must be, from what has already been attained

with less effective formulæ as a guide. I cannot use too strong language in urging upon the Institute the immediate organization of such an expedition, and upon its wealthy members and friends the duty of furnishing the means to equip and support it in the work to be done.

We can now say, as we could never say before, that no merchant ever made an investment with more certainty of success.

S. BESWICK.

Strathroy, Ontario, March 1, 1884.

REFLECTIONS CONCERNING THE SO-CALLED "π" VALUE.

BY THEODORE FABER, BROOKLYN, N. Y.

The "orthodox" view of the "relation" between the diameter of a circle and that circle's circumference is, that it is an *infinite* relation. Has this view any *sound* basis?

"Relation" is a word which any reflective mind will readily allow can solely be applied where *difference* exists. If the universe consisted of one absolute infinite formless space, no "relation" could be conceived to exist there. Hence, that word is, geometrically, solely applicable to "form" and its *motion* in space.

The diameter of "a circle" and the circumference of the same *form* are virtually "abstractions" which we *image*, for instance on paper, and apply our minds to define and *measure* their "*relations*"—for what purpose?

Astronomy has been one of the oldest sciences. Man could not help early noticing the regular motions of bright "spheres" in the "heavens," and the influence these exercise on his own being. It became an early object of man's intelligent mind to investigate "nature," and to learn to comprehend as much as possible of the *relations* of *moving forms* in space. Man early *imagined* the *geometrical forms*, such as globe and cube, and their divisions, which soon became permanent objects of special

study. Why? Because it soon became obvious to man that law presides in the Universe, *i e.*, *perfect order* in the motions of all *forms* in space, as if under the control of One Infinite Intelligence. And where man discerns any *true* geometrical relation on earth, he may fully rely on its universal validity. If it were not so, of what possible practical use would be to him the study of all nature and her laws?

We *image* the circular motion of small forms round larger, and such for instance as that of the moon round the earth and that of the earth round the sun, by "*circles*," and call the *distance* across—dividing the circle into two equal semicircles—the *diameter* of the circle; and what the *circumference* of a circle means, any one knows that has ever described a circle with a pair of compasses. We desire, for instance, to know the distance from the earth to the sun, and that of the orbit of the earth round the sun. It soon becomes obvious that we must first clearly understand the true relation between the diameter and circumference of an abstract circle before we can hope to make any approximately correct calculation at all in astronomical science. The orthodox view of the relation between the two objects has hitherto been that it is *infinite*, and the value of " π ," what is, the relation between the *diameter* and *circumference* of the circle is $=1:3.14159+.$ to infinity. The question looms up. "Can this be called *sound* doctrine?" Is it indeed "common sense" to assume the relation between two such elements of *form* as the diameter and circumference of "a circle" as *infinite*? Even though all space could be *imaged* by a circle, the two elements of the *imaged form* would *never* be *infinite*. It is impossible for man to image or comprehend the *Infinite*. Hence, it would seem to constitute actually treason to common sense to call any other relation but a *finite one true* between diameter and circumference of a circle. And unless the relation be universally valid, that is, even identical in the smallest conceivable as well as in the largest possible circle, what reliance could at all be placed in any astronomical calculation soever?

The writer's ratio 9:8 between circle diameter and square root of circle area and $1:3\frac{1}{8}$ between circle diameter and circle circumference, discovered after many years of ardent reflections,

finally virtually *prove*, beyond all power of refutation, the solution of the "Grand Problem" as Chambers Encyclopedia calls it, namely the quadrature of the circle, so intensely sought after in vain for so many ages, that two great scientific societies finally, some seventy years ago, were tempted to pronounce the solution "impossible," although such dictum found itself based on no other ground than the fact of its still remaining unsolved.

A thorough explanation of the ways and means which led the writer to final success in making the great discovery of the solution of the famous problem, and this in the face of the dictum of the two great scientific societies, would seem to be due to the world's public at large, but more especially to that of the discoverer's adopted country, a nation which is finally to decide whether there is any value or national honor in the great discovery.

The ratio "9:8" is a more simple expression than that of $2\frac{1}{4}:2$, which latter was found by analysis of the primary right angle 2:1, in the following manner: Assuming the first following square to the unit "1" namely 2^2 , and drawing a straight line from the middle of its summit side to either angle of the base side, the line divides the assumed square into two unequal parts, the smaller of which constitutes a right angle triangle, the two sides of which obviously are 2 and 1. The question arrives, what is the hypotenuse of the triangle? According to the "Pythagorean problem," the sum of the square of the two sides of the right angled triangle is equal to the square of the hypotenuse. Now, what would be that square in given case? The sum of $2^2 + 1^2$ is = 5 which is a *surd* or *irrational* quantity, from which no clear *square root* can be extracted, because an irrational quantity is ever only = $a^2 + 2ab$, lacking b^2 from constituting a *square*. Hence, if we would have the true hypotenuse of the given right angled triangle, we must add b^2 to the sum "5." The writer himself discovered a rule for finding what he called the "artificial root" of "irrational quantities," as follows:

1. Extract the largest *square* from given irrational quantity.

2. Subtract the extracted square from given irrational quantity.

3. Use the difference for the *numerator of a fraction*, of which *twice* the root of extracted square shall be the denominator.

4. Add this fraction to the *root of the extracted square*.

5. Now, *square* the found artificial root, and the result will invariably be = to given irrational quantity—plus square of the *fraction*—and the found artificial root will constitute the “*hypothenuse*,” which in given case is = $2\frac{1}{4}$.

Now, if we use this hypothenuse for radius of “a quadrant,” what will be its relation to the *large side* of the right angled triangle 2:1? Evidently $2\frac{1}{4}:2$. Now, obviously the relation between the quadrant radius and the large side of the triangle is precisely similar to the relation between the circle diameter and the *square root of the circle area*. But $2\frac{1}{4}:2$ is = 9:8, which latter is a more simple ratio, more easily handled, and this fact has to be set down as an axiom: whatever ratio is the *true* one in a single circle must necessarily be valid in all circles. But how did the writer arrive at the ratio 1:3 13-81 as between *diameter* and *circumference* of a circle? By the very ratio 9:8! What is the square root of the circle, whose *diameter* is 1? Answer: As 9:8::1:8-9—*i. e.*, 8-9 is the $\sqrt{\quad}$ of a circle of diameter = 2, it will be exactly double of 8-9—that is, = 17-9, and $17-9^2$ = exactly 3 13-81. But what makes the *area* of a circle of diameter “2” exactly = circumference of a circle of diameter 1? Because it is the *law* of harmony between measure and number, which Euclid theoretically discerned, when he declared his proposition, that the product of half a circle’s circumference, and the circle’s radius, is equal to the circle’s “*area*,” although he could not find the numerical ratio between diameter and circumference. Curious enough, by the writer’s “*Table of Proof*” it is distinctly seen that this proposition of Euclid holds good *in every case* exactly, an absolute proof of the correctness of the ratio 1:3 $\frac{13}{81}$. The proposition of Euclid is virtually tantamount to the finding of the *circle area* of diameter 2 as exactly equal to the circumference of circle of diameter 1.

The writer finally made the discovery that the circle area stands in an *invariable* relation to the area of the square of the circle diameter, namely in this: as diameter square is $= a^2 + 2 a b + b^2$, the circle area is ever $= a^2$ of this formula; but a^2 , as its very name indicates, is *a square*. Hence, it follows, that every circle area is equal to *a square*, and thereby *proves* the *solution* of the "*Grand Problem*." Every assumed circle-diameter will bring us out in this theory with wonderful precision, as per examples here presented.

1. By our ratio 9:8 as between diameter of circle and square root of circle-area—assuming diameter as $= 9$, the square root of the area will be $= 8$, and therefore the area $= 8^2 = 64$, while the square of the diameter 9 will be $= 81 = a^2 + 2 a b + b^2$.

$$\begin{aligned} \text{Now } 8^2 &= 64 = a^2 \\ 2 \times 8 \times 1 &= 16 = 2 a b \\ 1^2 &= 1-81 = b^2 \end{aligned}$$

2. Let us now assume a circle-diameter $= 100$, then the square of the same is $100^2 = 10,000$. What is the circle-area according to the ratio 9:8? As 9:8 :: 100:88 8-9, therefore the circle-area will be $= 88 \ 8-9^2 = 7901 \ 19-81 = a^2$. The difference between 100 and 88 8-9 is 11 1-9, and this difference multiplied by twice the root 88 8-9 is $= 1975 \ 25-81 = 2 a b$, and the square of the difference, namely, $11 \ 1-9^2 = 123 \ 37-81 = b^2$. Now, these three amount, namely,

$$\begin{aligned} 7901 \ 19-81 &= a^2 \\ 1975 \ 25-81 &= 2 a b \\ \underline{123 \ 37-81} &= b^2 \\ \text{are } 10,000 &= 100^2 \end{aligned}$$

and thus in every case of application, thereby *proving* the *absolute truth* of the *circle-quadrature* beyond all power of refutation!

The discoverer himself is filled with wonder every time he makes the application with his ratio 9:8, namely with wonder, that this simple truth had not been discovered before; but he discerns the insidious cause by which even Euclid was misled in the practical carrying out—while he had a correct insight theoretically, demonstrating even the logical necessity of the circle-area being equal to a square. This insidious cause resided

in a false assumption of *universal* validity of the famous "Pythagorean Problem," finally found to be only a special one. The long-prevailing ignorance of "Science" of the fact, that a so-called "*irrational quantity*" can ever only be $= a^2 + 2 a b$, had a great deal to do with the difficulty of "squaring the circle"!

After all, the difference in "value" between the *finite* ratio 1:3 13-81 and the orthodox *infinite* 1:3.14159 + . . . does not much exceed 3-5 %, but, when we come to consider that already 707 decimals have been added to the same infinite ratio, while billions of decimals added to the same would scarcely change the *per centage* of difference, it would seem to be childish to deny the *advantage of the finite ratio*. The ratio 10:9 has recently been proposed. This would change the ratio between diameter and circumference to 1:3 24-100 instead of 1:3 13-81, virtually the difference between the metric and anti-metric system of measurement!

COPY OF TABLE OF PROOF IN SUPPORT OF THEODORE FABER'S TWO RULES FOR SQUARING THE CIRCLE.

Conversion Ratio.	Circle Diameter.	Square Root of Circle Area.	Circle Area.	Ratio between Diameter and Circumference.	Circle Diameter.	Circumference.	Half Circumference.	Ra. Circle Area.
9:8	1	($\frac{3}{2}$) ² = $\frac{9}{4}$	$\frac{9}{4}$	1:3 $\frac{1}{8}$	1	3 $\frac{1}{8}$	1 $\frac{7}{16}$ × $\frac{1}{2}$ = $\frac{9}{4}$	$\frac{9}{4}$
	2	(1 $\frac{1}{2}$) ² = 3 $\frac{1}{4}$	3 $\frac{1}{4}$		2	6 $\frac{1}{4}$	3 $\frac{1}{4}$ × 1 = 3 $\frac{1}{4}$	3 $\frac{1}{4}$
	3	(2 $\frac{1}{2}$) ² = 7 $\frac{1}{4}$	7 $\frac{1}{4}$		3	9 $\frac{3}{4}$	4 $\frac{3}{8}$ × 1 $\frac{1}{2}$ = 7 $\frac{1}{4}$	7 $\frac{1}{4}$
	4	(3 $\frac{1}{2}$) ² = 12 $\frac{1}{4}$	12 $\frac{1}{4}$		4	12 $\frac{3}{4}$	6 $\frac{3}{8}$ × 2 = 12 $\frac{1}{4}$	12 $\frac{1}{4}$
	5	(4 $\frac{1}{2}$) ² = 19 $\frac{1}{4}$	19 $\frac{1}{4}$		5	15 $\frac{3}{4}$	7 $\frac{3}{8}$ × 2 $\frac{1}{2}$ = 19 $\frac{1}{4}$	19 $\frac{1}{4}$
	6	(5 $\frac{1}{2}$) ² = 28 $\frac{1}{4}$	28 $\frac{1}{4}$		6	18 $\frac{3}{4}$	9 $\frac{3}{8}$ × 3 = 28 $\frac{1}{4}$	28 $\frac{1}{4}$
	7	(6 $\frac{1}{2}$) ² = 38 $\frac{1}{4}$	38 $\frac{1}{4}$		7	22 $\frac{1}{4}$	11 $\frac{1}{8}$ × 3 $\frac{1}{2}$ = 38 $\frac{1}{4}$	38 $\frac{1}{4}$
	8	(7 $\frac{1}{2}$) ² = 50 $\frac{1}{4}$	50 $\frac{1}{4}$		8	25 $\frac{3}{4}$	12 $\frac{3}{8}$ × 4 = 50 $\frac{1}{4}$	50 $\frac{1}{4}$
	9	(8) ² = 64	64		9	28 $\frac{3}{4}$	14 $\frac{3}{8}$ × 4 $\frac{1}{2}$ = 64	64

Rule 1. Convert any given circle-diameter by the ratio 9/8 and you have the exact square-root of the circle-area.

Rule 2. Multiply any given circle-diameter by the mixed number three and thirteen-eighty-firsts (3 $\frac{1}{87}$) and you have the exact circumference of the circle.

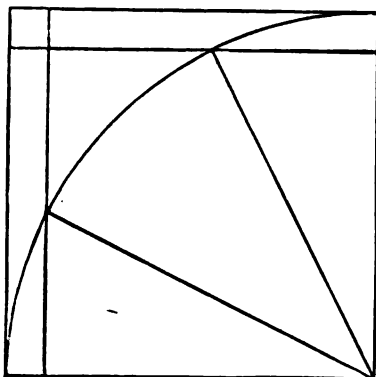
1. Draw an accurate square.
2. From middle of summit side of the square to either angle of the base side, draw a straight line which divides the square into two unequal parts, the smaller of which constitutes a right angled triangle, the two sides of which stand obviously related

to each other, as 2:1, thus constituting the *primary right angle*, the hypotenuse of which is *solely* expressible in a *finite*, and *not* in an *infinite* line, and when the *sum of the squares* of the two *sides* of the right angle constitute "*an irrational quantity*," the "*artificial root*" of that quantity, as obtained by Faber's rule, constitutes the "*hypotenuse*."

3. Now, using the hypotenuse for a radius, and moving the same to the left till it fall *in line* with the perpendicular side of the posited square, and moving it to the right till it fall in line with the base side of the same square, we have then "a quadrant."

4. Complement now the *square of the radius*. The question arises; what *relation* does the *area of the quadrant* bear to that of the first posited square? And what is the square of the radius?

Since the arc of the quadrant obviously cuts off a corner from the first posited square, and deposits the same quantity in two equal half arcs between the posited square and the square of the



radius, it becomes self evident that the first deposited square, and the quadrant are of perfectly equal area, and consequently that the quadrant area, in every case, bears the same proportion to radius square, that the first posited square bears to the same, namely, it is $= a^2$ of the $a + b^2$ of the radius 2 .

Now, the "quadrant" being simply the *exact fourth part of a circle*, it follows that the identical relations apply to the *whole*, that is: The circle-area is ever exactly equal to a^2 of the square of the diameter, the same as the quadrant area is

exactly equal to a^2 of radius-square. But " a^2 ," as its name readily indicates, is "*a square*," as much as "radius square" is "a square," and as much as circle diameter 2 is *a square*. This fact irrefutably establishes the solution of the "Grand Problem" of the circle-quadrature.

But what makes the $2 a b$ invariably = to product of twice the *square root* of quadrant area or of circle-area, and the *difference* between radius and square root of area? Because that is the exact content of the two parallelograms between the two squares, and b^2 consists of the square of the difference in the square roots of the two squares.

Thus, forever, most beautifully "*harmonizing measure and number*" never before accomplished.

Faber's ratio 9:8 between circle-diameter and square-area, wonderfully facilitates each calculation rendering the use of "*decimals*" fallacious.

WILLIAM OSBURN, THE EGYPTOLOGIST OF LEEDS,

1793-1875.

William Osburn, whose portrait, at an advanced age, we now reproduce for our readers, from a photograph taken and presented to us by a once Sunday-school pupil of his, now a photographic artist in Leeds (W. Hanson), was born in that city in 1793. After having received a good classical education in the local schools, he pursued for himself still further the study of various branches of ancient literature, both Latin and Greek; rejoicing in trials of intellectual strength with the best scholars of his time on the most difficult passages in Sophocles, Æschyles and Euripides. But, without fortune, he must do something more profitable for daily bread; wherefore, much against his own tastes, and the recommendations of those who had taught him, he entered into his father's business, which was that of a wine merchant.

Wearily and not successfully did he plod on at that occupation for nearly thirty years, vexing his friends by his total in-

capacity, as well as want of appreciation for "commerce," and giving himself up greatly to voluntary evening teaching to a large class of young men connected with a neighboring church. There he was most successful, forming them year after year, some into earnest school-masters (who were then greatly wanted in Leeds), and some into most devoted missionaries to carry the gospel into distant regions of the earth: so remarkable and powerful the influence he was gifted with by Nature, to obtain over the ingenuous, youthful mind.

But he by no means confined himself to elementary teaching of the young, for, being of strong evangelical views in religion, and having studied the old ecclesiastical literature deeply in the originals, he felt himself moved, when the High Church Oxford tracts came out under Pusey, Newman and others, to publish a work entitled, 'Errors of the Early and Apostolic Fathers,' in which book, by means of copious quotations from their writings, he was enabled to show the very early introduction of serious corruption and superstition in the Christian churches, both Latin and Greek.

His essay, though, however good in itself, obtained for him through the rest of his life the cold shade of the political leaders and government ministers connected with that Oxford movement. While his following works, 'The Life of Origen' and 'Hidden Works of Darkness, or History of Jesuitism,' so angered the Jesuits, that one of them (whom all scientific men would never have believed capable of such an act) tried to turn the tables upon him by declaring that William Osburn was, himself, that odious thing to free humanity "a dispensed Jesuit."

By this time (1847) William Osburn had not only left the unfortunate wine merchant business in Leeds, but, after having been called to be, and having practised as, a newspaper editor in Manchester, and published on the 'Antiquities of Egypt,' the ancient hieroglyphics of that land and its modern Coptic language—of which he finally produced a dictionary—he was invited by the Rev. Lord Wriothlesley Russel (a scion of the politically liberal house of the Dukes of Bedford) to become a private tutor to his two sons. This employment took Mr.

Osburn much away from his own growing family (for he had married in 1829), but was too congenial to his mental gifts to be disregarded. He accordingly became a travelling tutor to these young men, and afterwards to a son of Sir John Dean Paul, with whom he visited not only the chief cities of Europe but Egypt and Ceylon, whence he was enabled to publish his highest researches in both Egyptology and revealed religion in the shape of his 'Israel in Egypt,' in 1853; 'Monumental History of Egypt,' 1854; and 'Religions of the World,' 1855.

The above account is taken with very little alteration or addition by us from an excellent notice in the Leeds *Mercury*, for February 27, 1875, written, we believe, by its editor-in-chief, that able and widely-respected liberal politician and educationist, Mr. Baines. And what follows is taken *verbatim* from the same source, for we believe that it cannot be improved upon, even for our especial purpose of showing why William Osburn's portrait has been introduced into our International's gallery of worthies in science and religion, students of the Great Pyramid.

Thus, then, in winding up his account of the last days of a most striking existence, continues the editor of the Northern paper—

Owing to his long illness (acute and extensive chronic rheumatism) Mr. Osburn had withdrawn for many years from public life; indeed, only a comparatively small circle of surviving friends knew that he was still alive until yesterday. Eight years ago reference was made in the *Mercury* to the fact that the Astronomer Royal for Scotland had then written of the important and difficult researches of the deceased under the belief, then widespread, that Mr. Osburn was dead. Alluding at that time to Mr. Osburn's volume entitled the 'Monumental History of Egypt,' we wrote: "This work failed to take its proper position at the time of its publication, being both reviewed in a most unfriendly spirit by persons who ought to have sympathized in its author's object; and being unfortunate in its publisher, who became bankrupt while the work was in progress. Its detractors doubtless chuckled when Chevalier Bunsen, in his book on Egypt, discredited Mr. Osburn's views as 'of no value what ever.' Ten years more have elapsed, and within the last two

or three of them readers, both learned and unlearned, have been deeply interested by the publications of Professor Piazzzi Symth on the Great Pyramid. References to our townsman's slighted work are scattered over 100 pages of this writer's latest volume; and they have not only the weight derivable from the name of the distinguished author, but something like the impartiality of a verdict of posterity, the learned writer being under the misconception that Mr. Osburn no longer lives." It is now due to Mr. Osburn's memory that some portion of this testimony to the importance and value of his labors and their results should be quoted, and we therefore make no apology for extracting the most noticeable passages concerning him from Vol. III of 'Life and Work at the Great Pyramid':—then

“The whole monumental conclusion, formed by combining the quarry marks of the Great Pyramid with whatever is to be trusted, or is tolerably agreed upon among Egyptologists, and both of them with our astronomical date of the building, can be no other than that two of the kings of the fourth dynasty of Egyptian history, Shofu and Nu-Shofu by name, lived through a period including the epoch of 2,170 B. C., when the pyramids were being built. Mr. Osburn, the one historian into the very middle of whose date and duration for the fourth dynasty of Egypt the epoch 2,170 B. C., falls, was only brought to our attention recently, and then by an accident; but, after having experienced something of the earnestness of his manner and thoroughness of his style of investigation, we procured one after another of his works, tracing thereby the growth of his knowledge of Egypt, her monuments, and both ancient and modern language, continually increasing through a long period of years, until it may be considered to culminate in his 'Monumental History of Egypt,' published in 1854.

His grand and abiding purpose appears to have been to ascertain if the unlocking of the written materials of Egypt, by Champollion's method of interpreting hieroglyphics would disclose any trace of the sojourning of the children of Israel in the Nile land, or anything bearing on the Bible records of early events transacted therein or connected therewith. 'Is it not marvellous that they can now read the old Egyptian readily,

and understand its grammar? These Egyptian discoveries are likely to be one of the greatest wonders of our age' had written the late Dr. Arnold; and William Osburn pressed forward in his younger life with a youthful enthusiasm which did not tire during 30 years of devotion to the task, in order to acquire this power of reading and of grammar, that it might be employed on the one chief object of his life. To prepare himself worthily, therefore, for his subject, he appears to have visited Egypt, made himself well acquainted with its physical features and climatic experiences, studied its measurements *in situ*, and copied hieroglyphics with his own hand, over and above the never ceasing task of making himself familiar with all the idiomatic particulars of the Coptic language, the extensions of hieroglyphic interpretation-methods, the works of modern hierologists, and remains of all authors of antiquity who have treated on Egypt.

Hence, while he is often going over the same ground as Gardner, Wilkinson, Rosellini or Lepsius, there is a difference in his manner. With him no dallying by the wayside, entranced by vivid details of private life in ancient times, or the skill of ancient workmen, or the often intricate details of idol and animal worship; that is, for their own sakes, for he does not neglect such topics altogether, but keeps them in due subservience to his own grander objects of pursuit, and estimates their true value by the light of a more advanced civilization and a purer religion.

To trust no one of intervening time seems to be a notable principle with him; and, after sifting to the utmost all that has come down to us from Alexandrine Greeks, his principal labor begins with unravelling the tissue of fictitious history composed by the ancient Egyptian priests, and recorded by their despotic monarchs on the exteriors of their temples in a land of eternal slavery, where none dared openly contradict what was appointed to be inscribed.

For this remarkable purpose Mr. Osburn makes abundant use of the hieroglyphics found on private tombs sealed up in their own day, and only recently disclosed by excavations; but thereby in their turn unfolding for the first time the opposite side to

the official side of Egyptian history. And delightful is it to observe his astonishing facility in dealing with the hieroglyphic characters of every age, and in either large or small amount."

In other passages of his work, Professor Smyth claims an honorable position for the late Mr. Osburn amongst our philologists of reference, describing him as a man of peculiar talent, high resolve, noble purpose, and magnificent ideas of devotion in a good cause. During long years of solitary and unsympathized toil, the deceased labored in laying down a broader and more secure track over the morass of doubt and dark pits of oblivion which beset man's present knowledge of the affairs of the world as transacted from thousand years ago.

PERSONAL RECOLLECTIONS OF WILLIAM OSBURN, AUTHOR OF
THE MONUMENTAL HISTORY OF EGYPT, BY WILLIAM HANSON,
PHOTOGRAPHER, GREAT GEORGE STREET, LEEDS.

I was first introduced to Mr. Osburn in the year 1850, and the impression I then received of his personal appearance is that of a portly gentleman of middle height, with a genial expression of countenance, and a manner that was simplicity itself. My sphere in life has not brought me in contact with many persons of eminence, but I well remember speaking to one (Professor Owen) whose singular freedom from affectation, Mr. Osburn's manner much resembled. I never read "Pickwick" without being reminded of some of his *lighter* characteristics.

Mr. Osburn commissioned me to prepare the plans and illustrations for his 'Monumental History of Egypt,' and this work kept me in close communication with him for a long time, so that my first impression was well tested, and I am glad to be able to add that it did not change. After many years of intimate acquaintance he was still the same good natured, sincere, humble, *gentleman* I first saw.

Mr. Osburn looked forward with much hope to the publication of his "history," and often talked about future labors in Egypt, when he was to make fresh explorations and copy more inscriptions. But, alas! the very cold reception accorded to

the said "History" when it left the press, blighted all his hopes, while the catastrophic end of his much trusted former friend, Sir John Dean Paul, left him without further means to realize any of the plans he had conceived, indeed barely enough to live on. For sometime he bore up against the bitter disappointment, but, I am disposed to think that it proved fatal not only to his future Egyptological schemes but to his health and life eventually, his remaining years being passed first in illness and then in helplessness, suffering and neglect, till death put a period to all his troubles here, on Friday the 26th of February, 1875.

From the time of the preparation of his 'History' to the year 1864, I was a constant visitor at his lodgings, when he was not in York or Jersey; and the hours passed in his society are now among the most pleasant and improving of my recollections. His conversation was generally instructive and always interesting, never dull or common place. It was continually enlivened with wit, and frequently graced with fine imagery.

Mr. Osburn was perhaps more of a poet than a scientific philosopher. He seemed often to grasp a conclusion more as by inspiration than by patient labor, owing no doubt to the extreme quickness of his mental faculties, and his strong, animated, even vehement feelings. He had the bitterest hatred of Roman Catholicism, founded on the corrupt practices which he had witnessed at Rome and other places. He held through life steadily to the church of England, yet so liberally that he frequently attended the service at Queen Street Independent chapel during the ministry of the Rev. William Guest, a preacher whom he greatly appreciated and admired.

Mr. Osburn was quite lost to outward things when his mind was bent on any subject; and on one occasion, at the chapel just named, he so far forgot himself, that he attracted the particular notice of an old gentleman who occupied a pew behind him, by assenting to the sermon very freely with nods of his head, and other motions of the body, but which were sadly misunderstood, for the elderly gentleman referred to afterwards proved the pungency of the preacher's matter by telling a party of his friends that evening that it had made a

portly stranger in front of him sit very uncomfortably on his seat.

Mr. Osburn's spiritual life, during his terribly painful rheumatic afflictions was one often of great conflict and trial; but his faith in God's word was steadfast; and he was accustomed to say "great! faith shall have great trials."

On one occasion I found him much distressed in mind, and he repeated that remarkable hymn of Newton's, beginning:

" I asked the Lord that I might grow
In faith, and love and every grace;
Might more of his salvation know,
And seek more earnestly His face."

Never shall I forget the deep, passionate earnestness in which he spoke the whole words of the hymn. His face was upturned, the tears rolled from his eyes, and his whole frame shook under the strain of his intense feeling. For the moment he was a sublime spectacle, but a very solemn one, for he was crippled at the time by his rheumatic sufferings to such an extent that his old age had become like that of St. Peter, his garments bound about him by unsympathizing hands, and himself led to places he did not desire.

On another occasion of somewhat less suffering, he read from Milton's "Paradise Lost," the expulsion from the garden; but was so overcome that he could not finish the passage. I spoke to him of a bishop who was said to have committed the whole of this grand poem to memory, whereupon he replied: I do not doubt the statement, for if the first book of it were lost I could myself replace it from memory.

Another time I found him just finishing the perusal of Colenso on the Pentateuch. He closed the book and pushed it from him, saying with much vehemence—"I never was more convinced of the truth of this blessed book (the Bible)," and continuing, "Dr. Thompson's answer to Colenso is the best I have seen." About this time he read to me a short poem of his own, on "Simon the Cyrenian bearing the Cross," which greatly moved me.

Mr. Osburn was passionately fond of music, and he particularly admired the compositions of Mr. Bishop. Under the influence of music he used to pace the room and look very ab-

stracted. I think it acted as a stimulant to his thoughts.

Martin Luther found in him an enthusiastic admirer. He loved to read the "Table Talk," and delighted especially in its strong denunciation of the Popes. I should think that in temperament he much resembled the German reformer, at any rate he most cordially reciprocated Luther's detestation of shame and fraud in religion.

Among other things he so heartily hated was slavery. I never heard him speak on this subject without warmth. It moved his whole being to talk about the horrors of bondage. During the struggle between the Northern and Southern States of America he prayed night after night, when he could not sleep, that the former might prevail. So he expressly told me. He always spoke of Abraham Lincoln in terms of praise, and seemed to have a real affection for the good President's simple nature and honest purpose. Speaking of the slavery sometime *before* the war broke out, he said: "That is an account which will have to be settled in *red ink*."

As regards art, Mr. Osburn possessed a highly cultivated taste and sound judgment. He was exceedingly quick to appreciate merits or detect faults in a picture. He made no pretence of understanding the technicalities, but quickly recognized the higher qualities of art when they were present. The works of Raphael, Murills, Velasquez, Van Dyck, Sir Joshua Reynolds and Gainsborough (particularly the blue boy) afforded him much enjoyment. He spoke of John Ruskin as a "wonderful creature," and praised his "Stones of Venice" highly. Still I am disposed to think he loved the rude figures traced on the Monuments of Egypt, whenever he could trace their testimony to the truth of primeval history as given in the Bible, more than all these.

On one occasion he asked me to accompany him to hear the Rev. W. M. Punshon preach. When leaving the chapel, after the service was over, he ejaculated:

"Weave a circle round him thrice,
For he on honey-dew hath fed,
And drunk the milk of Paradise."

Mr. Punshon is a heaven-born orator."

Mr. Osborn had no capacity for public speaking, though he came so near it as to dictate to an amanuensis the subject matter, or contents, of his subsequently most successful books.

In fact his only absolute failing through all his life, excepting those matters of science, mathematical, mechanical and natural, which he did not pretend to go into, was, his total want of business qualifications for the art of making money. A banker in our city once said of him: "He is a great man, but he cannot distinguish between a sovereign and a shilling." This failing of course was a very serious one in the eyes of a trading community like that of Leeds, and was a main cause why his real merits were known to so few.

These fragments may not be much in themselves, but they will serve to show the man as he appeared to me.

WILLIAM HANSON.

Leeds, Nov. 22, 1883.

LIVES WHICH LIVE.

A SERIES OF BIOGRAPHICAL REVIEWS, BY THE REV. TIMOTHY HARLEY, F. R. A. S. LONDON, I. SIR JOHN HERSCHEL.

As we have already published Rev. Charles Pritchard's memoir of Herschel, we will give here some of Mr. Harley's selections from Herschel's works. He says: "We are struck with the versatility of his genius, which, without the least indication of unsteadiness, could turn in various directions, obedient to the currents of truth. What Dr. Johnson wrote of Oliver Goldsmith may justly be applied to Herschel: 'He left nearly no style of writing untouched; and he touched nothing which he did not adorn'"

In a critique of No. 99 of the *Quarterly Review*, on the "Mechanism of the Heavens," after alluding to the possible effects of "other conceivable laws of central force" than the law of gravitation, he finely says, with the humility which marks the highest order of mind:—"We may please ourselves with such speculations, and enjoy the beauty and harmony of their

results, in the very same spirit with which we rejoice in the contemplation of an elegant geometrical truth, or a property of numbers, without presumptuously encroaching on the province of creative wisdom, which alone can judge of what is really in harmonious relation with its own designs. The stability of our actual system, however, rests on a basis far more refined, and far more curiously elaborate. It depends, as we have before observed, on no nice adjustments of quantity, speed, and distance. The masses of the planets, and the constants of their motions, might all be changed from what they are—within certain limits—yet the same tendency to self destruction in the *deviations* of the system from a mean state would still subsist. The actual forms of their orbits are not ellipses, but spirals of excessive intricacy, which never return into themselves; yet this intricacy has its laws, which distinguish it from confusion, and its limits, which preserve it from degenerating into anarchy. It is in this conservation of the principle of order in the midst of perplexity—in this ultimate compensation, brought about by the continual action of causes which appear at first sight pregnant only with subversion and decay—that we trace the master-workman with whom the darkness is even with the light.”

In his presidential “Address to the British Association for the Advancement of Science,” at Cambridge, in 1845, Sir John Herschel concluded with this beautiful peroration: “True science, like true religion, is wide-embracing in its extent and aim. Let interests divide the the worldly and jealousies torment the envious. We breathe, or long to breathe a purer empyrean. The common pursuit of truth is of itself a brotherhood. In these our annual meetings, to which every corner of Britain—almost every nation in Europe—sends forth as its representative some distinguished cultivator of some separate branch of knowledge; where, I would ask, in so vast a variety of pursuits which seem to have hardly anything in common, are we to look for that acknowledged source of delight which draws us together and inspires us with a sense of unity? That astronomers should congregate to talk of stars and planets—chemists, of atoms,—geologists of strata—is natural enough; but what is there of *equal* mutual interest, *equally* connected with

and *equally* pervading all they are engaged upon, which causes their hearts to burn within them for mutual communication and unbosoming? Surely, were each of us to give utterance to all he feels, we would hear the chemist, the astronomer, the physiologist, the electrician, the botanist, the geologist, all with one accord, and each in the language of his own science, declaring not only the wonderful works of God disclosed by it, but the delight which their disclosure affords him, and the privilege he feels it to be to have aided in it. This is, indeed, "a magnificent induction—a consilience there is no refusing. It leads us to look onward, through the long vista of time, with chastened but confident assurance that science has still other and nobler work to do than any she has yet attempted; work which, before she is prepared to attempt, the minds of men must be prepared to *receive* the attempt—prepared, I mean, by an entire conviction of the wisdom of her views, the purity of her objects, and the faithfulness of her disciples."

Mr. Harley concludes his memoir with a selection from Herschel's poems. It is entitled

"MAN THE INTERPRETER OF NATURE."

Say ! when the world was new and fresh from the hand of its Maker,
 Ere the first modelled frame thrilled with the tremors of life,
 Glowed not primeval suns as bright in yon canopied azure,
 Day succeeding to day in the same rhythmical march ;
 Roseate morn, and the fervid noon, and the purple of evening—
 Night with her starry robe solemnly sweeping the sky?
 Heaved not ocean, as now, to the moon's mysterious impulse?
 Lashed by the tempest's scourge, rose not its billows in wrath?
 Sighed not the breeze through balmy groves, or o'er carpeted verdure
 Gorgeous with myriad flowers, lingered and paused in its flight?
 Yet what availed, alas ! these glorious forms of creation—
 Forms of transcendent might—Beauty with Majesty joined,
 None to behold, and none to enjoy, and none to interpret ?
 Say, was the work wrought out? Say, was the Glory complete?
 What could reflect, though dimly and faint, the ineffable purpose
 Which, from chaotic powers, Order and Harmony drew ?
 What but the reasoning spirit, the thought and the faith and the feeling ?
 What, but the grateful sense, conscious of love and design ?
 Man sprang forth at the final behest. His intelligent worship
 Filled up the void that was left. Nature at length had a soul.

* A SUCCINCT HISTORY OF THE INTRODUCTION
AND ESTABLISHMENT OF THE DECIMAL SYS-
TEM IN FRANCE.

For centuries thinking men in European nations had been dissatisfied with the uncertain character of the units which formed the basis of the various scales of measure, and they desired to discover some invariable principle in nature suitable as a standard unit.

In 1658, the Dutch Astronomer, Huygens, published a work entitled, *Horologium Ascillatorium, Sive de Motu Pendulorum*. He recommended the length of the pendulum of a clock, vibrating seconds of mean time, as an *invariable* unit. This work came under the notice of the celebrated Picard, who zealously advocated the views of his contemporary; but, a short time before his decease, it was discovered that the length of the pendulum varied with the latitude. This discouraged the philosophers for nearly half a century till Cassini suggested that a unit derived from the magnitude of the earth would be more likely to prove invariable than any other. This hint of Cassini issued in the production of the metrical system; it aroused the attention of a French astronomer, M. Mouton, who flourished near the middle of the last century. He proposed that a *minute* of a degree of the meridian should be taken as the *superior* unit, from which all other measures should be derived, proceeding in a subdecuple series. To him belongs the honor of promulgating *the first idea of applying the decimal system to measures of quantity*.

M. De La Condamine, who had been employed in measuring a degree of the equator in Peru, revived the pendulum scheme; his aim was to make the length of this instrument a standard unit of quantity for the whole world, and he recommended the equator as a suitable position whence it might be taken. But

* Abridged from the 'Decimal System' by Jno. H. Felton.

Condamine died, and his scheme lay dormant for forty years. Talleyrand then brought the pendulum theory again before the world. He submitted it to the Constituent Assembly in the year 1790, and procured the appointment of a committee, consisting of Borda, Lagrange, Laplace, and others. They considered the pendulum deficient in those properties required in a perfect standard, and preferred taking a unit from the earth's magnitude. The report of this commission issued in the introduction of the decimal system. It recommended that the distance between the equator and the pole be divided into ten millions of equal parts, and that one of these parts form the length of what should be considered as the grand standard unit of quantity to be called the metre, from which, by decimal multiplication and division, all other quantities on the scale of length should be derived.

To M. M. Delambre & Machain was assigned the office of ascertaining, by actual measurement, the exact length of this important unit, the metre; and the ground chosen for the experiment was between Dunkirk and Barcelona, Delambre taking the northern part, Machain the southern. This great undertaking was projected just before the troubles of the revolution arose, and the seal and signature of the unfortunate Louis XVI. were appended to the instrument of appointment. The document, therefore, only invited persecution. The mathematicians were regarded by the country people with jealousy and suspicion. They were ill-lodged and worse treated. By some they were considered wizards, or lunatics; by others, emissaries of Satan; by all, enemies of mankind. Before their task was half executed they received intelligence from Paris that their names, and those of their associates, were struck off the commission by order of the ruling powers: But they took courage and proceeded on their own responsibility, trusting to the national sense of honor for reimbursement at some more favorable period. In this they were not disappointed.

But, although the tyrants at Paris abandoned the commissioners, they valued the object of their labors so highly that they lacked patience to allow time for its maturity. The Committee of Public Safety, acting under the influence of Robes-

pierre, attempted to effect the contemplated changes by means of a standard, which was afterwards known as the *provisional metre*.

Shortly after the reign of terror had spent itself, the commission was reconfirmed, the names of the mathematicians restored, and they were allowed to proceed with their labors under government patronage. The whole of these important operations were conducted under the general superintendence of numerous commissioners, members of the Institute, together with commissioners from Spain, Italy, Holland and Switzerland.

One singular fact connected with the history of the decimal system is, that two of its earliest supporters seem to have been the very antipodes of each other—we refer to Louis XVI. and Robespierre. The latter had been a zealous patron of the object of our history from its earliest promulgation, but no sooner had he attained a preponderating influence in the Committee of Public Safety than, to the surprise of all, he deprived of their office Delambre and his party. This arose from his deadly animosity to the power from which that committee had received their appointment. He had also observed that the people were favorably impressed with the enterprise, rather from the praises they had heard from his party than from any clear conceptions of their own. Nor had it escaped his notice that the common denominations of weights, measures and coins were in many ways associated with objects of royalty. He, therefore, determined to break up the metrical committee, to divest the language of all names offensively royal, and, at the same time, to gratify the people by the speedy introduction of the decimal system. His first movement—namely, that of directing a death blow at the Royal Committee, as it was derisively termed, was explained by his publicly declaring that he did not intend to forfeit the advantages of the new system, which, he stated, might be much more expeditiously obtained without than with the assistance of the metrical committee. He knew, also, that with a people fond of novelty everything must be done in hot haste; and, since neither time nor money could be spared for geodetic operations, he decided upon hazarding

another stake for popularity by taking a metre of his own devising.

The length of this precocious product of expediency was calculated from data furnished by Lacaille, who, in the year 1758, had computed a degree of the meridian in 45° latitude to comprise 57027 toises.

This took place at the commencement of the reign of terror, when Robespierre, Couthon, and St. Just held a kind of blood-stained triumvirate in the Committee of Public Safety, and used the other members chiefly as instruments to lend a sanction to their diabolical proceedings; and this committee, in their turn, governed the convention. There was, therefore, no difficulty in the introduction of a temporary metre until a more convenient period, when, as was promised, a correct one should be obtained by actual measurement. A decree to this effect was hastily prepared, but a part of its provisions were considered ineligible, until modified by a succeeding one; after which it was finally adopted, and became law on the 18th Germinal (March) A. D., 1794.

The metre, of course, was the grand unit of quantity, from which the units of weight and measure of capacity were to be derived. The nomenclature of this scheme differed from the one now used, by not admitting the denary multiples of the various units, but only the submultiples *deci* and *centi*. To supply these omissions, several denominations in each class of measures were used.

This project may literally be said to have been baptized with blood. The law which gave it a being was enacted at the commencement of the "Reign of Terror," but it cannot be said to have been placed in operation until after the conclusion of that horrible era. During that period the country was in a state of commotion that defies description. Nearly every province had its Robespierre, above the whole of whom Carrier, of water-marriage noteriety, held a distinguished pre-eminence as being the most extensive slaughterer of his race. The awful tragedies closed with the sudden removal of the principal actor and his associates from the stage of time, by the same machine which they had so liberally employed for the destruction of others.

One of the most active, influential and zealous friends of the cause was La Reveillere Lepeaux, well known in France by the first part of his name, and abroad by the last. He was a zealous Girondist, and formed one of the party that suffered banishment on the ascendancy of their political enemies, the "Mountain." After the execution of Robespierre, Lepeaux returned to Paris, and was permitted to resume his seat in the convention where he arranged himself on the side of the moderate party. Here he labored hard in advocating an improved decimal system. He soon procured a decree for its introduction, which, however, was not put into operation until he was advanced to a higher post of political power.

The provisional government gave place to one in whose creation they had been chiefly instrumental. This formed the third constitution, and was better known as the "executive directory." The leading power was vested in five directors, of whom Lepeaux was one. He seems to have owed his elevation to his fame for learning, and the prominent position he took in promoting the advancement of the new decimal plan; he was, also, one of the few survivors of the preceding massacre, who had taken a part in the condemnation of the late king. His character was a singular compound of philosophy, fanaticism, and infidelity; the chief powers of his mind were concentrated in an attempt to effect two objects: the establishment of a new decimal system, and a new system of religion. The latter he intended to found on the ruins of Christianity. This system seemed to unite two extremes; for while he ridiculed the Bible, he admitted, admired, and taught absurdities that would have sparkled in the pages of a jest book. His speeches were wafted across the English channel, and proved an acceptable condiment in the banquets of those who assembled nightly to read, and to hear read, the wisdom of Paine. Such was the man who figured as the leading promoter of the second decimal project in France.

The executive directory assumed their full powers in the autumn of 1795. Parisians had begun to respire, and trade and commerce to assume something like their former appearance when the new decimal plan was brought into operation. It was

thought a fortunate circumstance that Lepeaux's exaltation took place at that critical juncture, but this coincidence seems to us rather problematical

Article 2 of the decree which received the sanction of the convention, and became law at the above named period, says, "There shall be but one standard of weights and measures. It shall be a rod of platina, on which the metre, the fundamental unit of the whole system of measures shall be traced."

Article 5 defines the metre. "Metre, the measure of length, equal to the 10,000,000th part of the arc of the terrestrial meridian, contained between the North Pole and the equator."

Lepeaux and his coadjutors also attempted to reform the calendar, giving 30 days each to the 12 months of the year, and altering the names of the months. The 5 days of excess were to be celebrated as holidays. The days of the months were to be divided into decades; every *10th day* was to be considered the Sabbath, in accordance with Lepeaux's "Theophilanthropy," and no other Sabbath was to be publicly sanctioned. The hours of the day and the minutes of the hour, together with all shorter periods of time, were to be arranged in a descending subdecuple series. Such was the law. Many parts of this absurd article of the decree have been subsequently repealed.

Lepeaux's admiration of the decimal system assumed the form of a mania that required all numeral objects to be considered in the order of *tens*. The day soon arrived for the introduction of the new system, but, alas for rulers, projectors, and people, the manner of *placing it in practical operation* had either been overlooked, or too faintly regarded. No public instructions had been issued that were available to the wants of the people. The early patrons of the new system had swept away all the old standards, and it was now seen, and felt too, that *no single term on the new scales found a corresponding quantity on the old tables*. Even the metre, described a quantity totally unintelligible to the people. They had supposed that this new system would, by a kind of magical process, convert confusion into order, and establish uniformity from one end of the nation to the other. But when the whole scheme, with its strange names undetermined quantities, and provokingly inconvenient magni-

tudes was fairly placed before them, it was so widely different from everything they had looked for, that their extreme disappointment found vent in unmistakable sallies of indignation. The retailers and small purchasers felt the greatest degree of annoyance. They were unable to carry the law into effect, from sheer inability to calculate the required equivalents. Thus the buyer found himself at the mercy of the seller, and every trivial sale was attended with a sharp contest; respecting the rights of *meum* and *tuum*. Every purchase partook of the character of a speculation. This, combined with the confusion and perplexity produced by the oversight which we have named, was sufficient of itself to have ruined any project even if contrived with the genius of a Euclid. But there was something beyond this. The new quantities *when determined* were to be called by *new names*. The prefixes of the terms denoting multiplication were derived from the Greek, and those denoting division from Latin. But the French peasant knew nothing of Greek or Latin, and the whole plan was as unintelligible to him, as if the names had that day been imported from China. He was continually confounding *deci* with *deca*, *hecto* with *kilo*, and *myriagramme* with *millegramme*. Besides this he could never remember their *order*.

Another cause of complaint appeared, which, though not so perplexing as the former two, yet must surpass both in duration. We mean the *inconvenient magnitude* of the quantities proposed, in lieu of those they were designed to supersede. This blemish is not very conspicuous to the general observer, from being felt almost exclusively by those who are daily employed in manipulating weights and measures; but to them it now proves and ever will prove, a perpetual discomfort.

During the revolutionary storm, 300,000 keepers of retail stores were incarcerated, their property confiscated, and their prospects ruined. Trade and traffic were regarded as ignoble pursuits, while "the pride, pomp and circumstance of glorious war," were, with all classes on a worshipful eminence. But the small dealers were not the only persons embarrassed; every individual of the great public, that is, every buyer as well as every seller, was compelled to endure some portion of the

general grievance. In a short time the general tide of metropolitan murmurs received a large accession from the rural districts, until its accumulated force threatened the very existence of the government. Barrass and his associates in power, at length aroused from their dreams of future prosperity, by the clamors of the populace, felt that they could no longer remain quiescent spectators of this grand working of events in Lepeaux's department. But what could they do? Some feeble attempts were made by means of public instructions, yet all such were found to be of no avail so long as the new denominations remained unaltered. The directors were in the position of children, who, having set a complicated and powerful piece of machinery in motion, were standing mute with wonder and affright from a conscious sense of their inability to stop its progress or control its motions.

Another cause of the unpopularity of the decimal system at that time, is found in the manner in which it was associated in the minds of the people, with Lepeaux's ridiculous "Theophilanthropy." Perhaps the most unfortunate event in the catalogue of mischances that attended the introduction of this reform, was that of making it subservient to the purpose of infidelity by abolishing the Christian Sabbath. This impious innovation originated with Robespierre, and not with Lepeaux, as it is generally supposed. He of the guillotine introduced the denary Sabbath into France, by appointing one day in ten, according to his system of divinity, for the religious consideration of some one of the virtues, as truth, justice, and the like, What fellowship he had with these virtues it is difficult to imagine.

However, this sacrilegious use of the system to perpetuate a continued breach of the decalogue, placed every Christian in direct antagonism to its advancement; and although the prevalence of infidelity in that age is a melancholy fact, yet the whole nation was not entirely submerged by that wide-sweeping whirlpool. Shortly after the excitement caused by the late cruel dynasty had subsided, we find 500 priests in Paris, and Lepeaux persecuting them in hot indignation for ridiculing his religious amusements. It is a notorious fact that this new

calendar, with its decimal Sabbath, as it was called, fixed upon the decimal system a stigma that is scarcely yet removed. At that period every man whose religion was anything beyond nominal, felt himself bound to oppose it upon principle. An open attack had been made upon the religious feelings of the whole nation, and those who continued indifferent to the result must have felt condemned as traitors to their God, and not many degrees better than the Judas-like characters, who, in order to trade with the crescent, trampled upon the cross.

At this juncture the directory were informed that the commissioners first appointed to ascertain the length of the metre, were proceeding with their labors. This intelligence was at first received with astonishment, mingled with displeasure arising from a feeling of rivalry. The provisional metre was, on its introduction, publicly announced as being nothing more than a substitute for one that would, at some future period, be obtained by actual measurement. But, certainly, nothing was more foreign to the intention of all concerned in the directory than to connect themselves, in any way, with the "royal metre," as it was contemptuously called. Yet now, the directors, trembling for their places, and, probably, for their lives also, were glad to avail themselves of any expedient to divert the torrent of indignation which threatened to overwhelm them. Two out of the five had given place to others, but Lepeaux still held the reins of government, though with an unsteady hand. Talleyrand had recently joined their councils, and obtained their utmost confidence. He wisely recommended them to cast oil upon the troubled waters by patronizing the metrical committee. To him this very committee owed its existence, and he had no connection with Robespierre's abortive attempt to effect its destruction. Accordingly Delambre's friends were courted, a new decree was issued in favor of his committee, and they were encouraged to proceed with their labors. It then became the fashion to sound forth the sterling merits of the legitimate metre; its presumed mathematical accuracy was applauded; the people were assured that the old names of quantity should be restored, and an entirely new system ar-

ranged ; and the scheme was entitled "a grand expression of national talent."

On their entry into Paris, the metrical committee were received with public expressions of courtesy and respect. Their report was presented on the 10th Prairial, A. D., 1798, and was received with unbounded applause. A new material metre and kilogramme were constructed on truly scientific principles, and presented with a pompous address to the two councils of the legislature ; and these prototypes were ultimately deposited among the national archives, where they are still preserved with little less than religious veneration.

Borda was directed to ascertain, with scrupulous care, the exact length of the seconds' pendulum at Paris, for the purpose of establishing that of the metre, thus to facilitate its recovery in case of loss or accident. The absurd article of the previous decree, relative to the decimal division of time, was repealed, except the denary Sabbath, which Lepeaux still managed to preserve.

This committee also introduced the decimal division of the *quadrant*, but that achievement procured for them more compliments than sterling credit. The decimal system when applied to proper objects prevents perplexity, *but the circle is not of their number*. It is already provided with a mensuration suitable to its peculiar denary proportions, and one which admits of no improvement.

On 13th Brumaire, A. D., 1798, the legislature acknowledged the metre and kilogramme, recently presented, as the legal criterions of the measures of weight and capacity for the whole of France, to the exclusion of all others ; at the same time admitting the names proposed by the earliest committee, but leaving the decimal divisions of the metre and its units undisturbed. The list of denominations now permitted, consisted partly of names in general use before the revolution, with a mixture of others known only in particular localities. The well known sounds of the old names awoke former associations, and seemed like the voices of old friends ; but this drop of comfort was sadly embittered when it was discovered that these names were to be matched with the former decimal quantities. *Nor was*

this new measure rendered more palatable from being concluded with a threat of compulsion.

After the novelty and excitement attending the introduction of the amended plan had subsided, its popularity ceased ; and, in spite of the long tables of equations, and all other "appliances and means to boot," the calculations of value and quantity in the retail department of trade, still continued to be impracticable to many, perplexing to most, and odious to all. Instances of the people taking "French leave" to match the old names with the old quantities in their bargains, need excite no surprise when we reflect that it would be more likely for buyers and sellers to prefer to transact business by a system well understood by both, than by one that was intelligible to neither.

This third essay to introduce the decimal system was regarded by Lepeaux with feelings of displeasure, since it implied the superseding of his own well ordered nomenclature by another that was remarkably clumsy ; yet he turned it to some account, since it furnished him with a pretext to prosecute those Christians that fell within the meshes of the law, and we bear record that he availed himself of this chance to the fullest extent of his power. He had formerly secured the attention of the multitude to his theological whimsicalities, through the imposing character of pompous exhibitions, seconded by his own oratory ; but, these things having lost the lustre of novelty, were fast sinking in public esteem. He experienced another mortification from the decline of his popularity in the national councils. All these misfortunes he attributed to sacerdotal influence. At last, opposed by all parties and at all points, he threw up in disgust an office of considerable power, after having held it for nearly four years.

All parties were now sick of the decimal system ; the legislature in making and repairing laws, and the people in observing those already enacted and the contagion continued to spread until it assumed the type of a confirmed epidemic. As to the project itself, notwithstanding the royalty of its origin, it was now in a pitiable condition. Clothed in the ragged garments of infidelity, deserted by its legislative protectors, opposed by the

craft of the politician, the zeal of the priesthood and the thick-skulled fury of the ignorant, it still, nevertheless, struggled on, maintaining a dubious and somewhat occult existence, until the memorable period of the invasion of Russia by the armies of France.

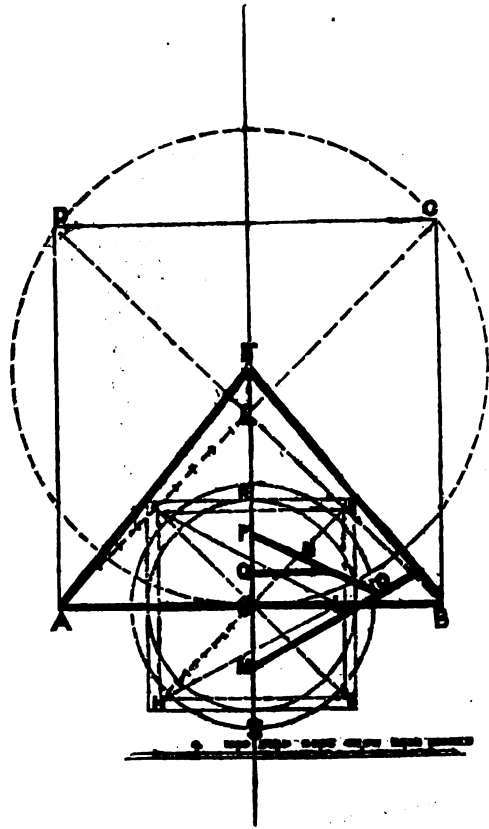
The legislature of that day made a decree, granting the use of the ancient terminology in connection with the metrical standard units, on condition that the word *usuel* be added to each, whenever such names are expressed. Thus the *toise usuel* described two metres; the *livre usuel* equalled half a kilogramme, and so on for others. But the most striking article in this decree is that which directs that these units shall *not be divided decimally* but in *duodenary* order, that is, into halves, thirds, quarters and eighths.

This act of surrender on the part of the ruling powers, may be regarded as the total abandonment of the decimal principle, as far as they were concerned; we find that France had then gained little beyond the *metre*, and the experience resulting from a series of troubles, from the first day that Delambre's committee left Paris on their geodesical enterprise to the date of this decree, A. D. 1812, a space of time numbering just 21 years. How easy it is now to perceive that the Parisians might have obtained a suitable standard without the assistance of any committee. We mean their *toise*—a measure with which all Frenchmen were acquainted. Besides, the act of taking the exact length of the pendulum for the purpose of preserving that of the *metre*, invests the rod of motion with the dignity of the ultimate criterion. Hence, the pendulum after all becomes the *principal standard*.

The sticklers for the decimal system, brought the decimal and the duodecimal scales into collision; for the new ounce and its divisions on the *usuel* scheme were so widely different from the *gramme* and its decuples, that the proportions could not be ascertained without a troublesome calculation. Perplexities and embarrassments pervaded the whole community. Artificers, in order to accommodate their various patrons, found it needful for the purposes of measurement, to be provided with a prism, having the divisions of the "*foot royal*" delineated on one side,

the *centimetres* and *millimetres* of the decimal school on another and the quantities *usuel* on the third. These annoyances were not confined to the marts of commerce, they were also felt in pharmacy, for no dependence could be placed upon the manner of preparing medical prescriptions; and all things conspired to make it appear as if the confusion of Babel had met with a modern parallel; all confidence in "men and measures" having given up the ghost!

In order to still the tumult, the government, then under the dynasty of the Bourbons, interposed the weight of its influence with the view, it is believed, of entirely submerging the decimal principle as regards quantity. But this very movement seemed to call forth more friends to the cause which it was designed to crush, than it was ever supposed to have possessed. Whether this accession of support was due to political motives, or, whether it was instigated by the published animadversions on the decimal plan made by foreigners visiting France, it is hard to determine; but while it protracted the convulsed state of society, it aroused the system from that condition of suspended animation in which alone it could be said to have existed. The friends of the decimal principle availed themselves of these circumstances to strengthen their ranks, and exerted themselves right earnestly to secure quietude and convenience by the establishment of the complete decimal system of 1795. The spirit of the age was more favorable. The dealers were harassed with the vexations we have described, and a reaction was evidently produced, so the legislature, plied hard by the friends of the principle, took advantage of the popular movement, and passed the last decree in favor of the decimal system, A. D. 1837. This law made the original plan and the present nomenclature compulsory throughout the whole extent of France. after the first day of the year 1840. The space of nearly three years was allowed for the public to become acquainted with the names of the quantities and the demands of the decree, which it was understood would be rigorously enforced. This law has been observed. At first some reluctance was manifested by the lowest class, which caused the legislature a little trouble, but the people of France are at length in possession of their decimal, or metrical system after forty-five years of toil and disquietude.



PYRAMIDAL FREEMASONRY.

BEING A SERIES OF ANNOTATIONS ON THE ORIGIN OR ARCHETYPE OF FREEMASONRY DISTINGUISHED AT THE BUILDING OF THE GREAT PYRAMID IN THE LAND OF EGYPT, 2170 YEARS BEFORE THE PRESENT DISPENSATION. READ BY THE SECRETARY BEFORE THE OFFICERS AND BRETHREN OF THE ST. AMBROSE LODGE, NO. 1891, HELD AT BARON'S COURT HOTEL, WEST KENSINGTON.

Before closing these essays I wish to add substantial proof, and endeavor to show what a grand delineation of magnitude and extension there is displayed, geometrically, in this Pyramid of Gizeh, in the land of Egypt. Our Masonic ceremony, speaking of geometry, says: "By it we may discover how the planets move in their different orbits, and mathematically demonstrate their various revolutions. By it we can, rationally, account for the return of seasons, and the beautiful and mixed variety of scenes which each season displays to the discerning eye. Numberless worlds are around us, all formed by the same Divine artist, which roll through this vast expanse, and are all conducted by the same unerring law of Nature. Then, while such objects engage our attention, how ought we to improve, and with what grand ideas ought such knowledge to fill our minds? A survey of nature, and an observation of her beautiful proportions, first induced man to study symmetry and order. This gave rise to societies, and birth of every useful art. The architect began to design, and the plans which he laid down having been improved by time and experience, have produced those stupendous works of art which have been the admiration of every age."

We may, therefore, consider geometry is the most important part in the original design, collectively with the cosmic relation of the universe, in framing this most noble pile of stone masonry we have been, theoretically, exploring on paper, without the fatiguing journeys to or from, and coping with sand drifts and other annoyances from the Arabs and their plunderings.

I intend by this diagram to show, by plain geometry, how this Pyramid was set out or planned by the Grand Geometrician of the Universe, by unerring lines; but those lines in true conformity with the vast ethereal expanse of worlds, and governed by the same geometric laws; lineal measure being also determined by these laws—the cubit of 25.025 and unit of 1 inch being the fixed standards. Colossal as our structure is, it is an atom only in space, yet situated and so built as to form a miniature world, proved by its mathematical correctness.

We will follow through the application of principles adopted in first laying down the plan of the building. We have advantages our ancient forefathers did not possess, except to very limited proportions. All knowledge was transmitted orally, or by illustration; not so now, for we have the advantages of printed matter, and other resources, to guide our pursuits in geodesic knowledge. The first operation being to lay level a hard rocky surface of fourteen or fifteen acres, and set out the four sides correctly with the cardinal points (any size would have answered according to the principle laid down), but there was design of great skill and ability to fix the base side lengths A, B, C, D, each side delineating the 365¼ days of the solar year; this correctly accomplished, a line was drawn from corner to corner diagonally each way, crossing each other at E, the sum of which in the fixed unit of inches denotes the slow precession of the equinoxes, 25,827 years. Then from the centre, E, divide one of the semi-diagonals, say from E to A, into ten equal parts, and take nine of these parts for the height of the Pyramid, F. (This $\frac{9}{10}$ of the

half diagonal, or $\frac{1}{2}$ of the whole diagonal, of square base being the key, and the only key required to unravel all the slopes, inside and out, in a constructive point of view; in short, it solves the whole construction in its simple geometric details).

In the next place, describe a circle with F as a centre, the circumference of which will be equal to the four sides of the square base, A, B, C, D, with unerring exactness,—the outline of the Pyramid being thus duly formed at its proper angle, $51^{\circ}51', 14.8''$. We shall see, as we proceed, how each part is based on the true principle of plain and practical geometry. Following on we will next proceed with the inside passages, continuing the same adaptability of lines and superficies; in this instance beginning with a circle in place of a square, dividing the height of the Pyramid into two equal parts, F, G.—describe a circle with this half height, having the point G on the base line for its centre. Divide into four the radius of this circle, to form the square whose four sides equal the circumference, and whose diagonal lines thus divided are parallel with the former diagonals of square base, and, crossing at G, divide one of these lines from the point G to H into nine equal parts, add one of these parts to each diagonal line outside of circle at H, I, J, K, and from each of these points draw straight lines forming the desired square. The two upper angles of this square at J, K, intersect with, and bisect the semi-diagonals of the base between A, E, and B, E, of the first formed square. This would again prove the correctness on which the geometrical problem rests, and also proves the mathematical precision of the Great Designer when constructing the work. But, to proceed; from the lower corner of this square at H, draw the hypothenuse from H to L, and also from the upper corner from K to L (dotted lines), thus forming the true angle of inclination or slope, $26^{\circ}18'$ of the ascending and descending passages. To determine the position of these passages according to this angle of inclination, for the descending passage, bisect the lower half of circle from G to S at M, and draw the line parallel with H, L, extending to the outer casing of Pyramid, from the central axis; to form, or determine the position of floor-line of first ascending passage and grand gallery, bisect the diagonal line from G to J at N, and parallel with K, L, draw the line P, O, from central axis at P, and intersecting on descending passage line at O, thus completing the true angle of inclination and position. Also, for lengths, for the passage way to queen's chamber; divide equally in two parts the height, between P and G, on vertical line at Q, from which point draw a line parallel with base of Pyramid, intersecting the ascending passage floor-line, truly correct in position on that line, to form the requisite lengths of grand gallery, and the passage way to it, with marvellous exactness, when compared with our great measurer, Piazzì Smyth, in his work, 'Our Inheritance in the Great Pyramid.' This last completes the passages as far as we know.

Having these passages and angles correctly and geometrically set in position, I may add they define and lead up to a positive problem, only defined, as far as my limited observation has extended, in this our gigantic pile of masonry, and that at an age when, as some of our scientists would assert, few but barbarians existed. But to return to the point where we left off; on the central vertical line we divided the distance between P and G at Q; now, if we turn over the compasses to a third point, at R, we have Q, P, R; on this point R is the top line of the square of Piazzì Smyth's diagram, which square, in area, equals the area of the circle, having G for its centre, or the half height of the Pyramid; and if we describe a circle from the same centre, inside this last square (both the circle and square, in my diagram, are in red dotted lines), this circle will equal, in area, the square I obtain for the inclination or slope of the passages, and I think I may be bold enough to assert if these lines are truthfully drawn they will bear me out in my working of this problem, and I have yet to learn where the geometrical lines are to be found outside of the Pyramid and its mathematical proportions. Here we have the area of a circle equal to a given square, and the area of a square equal to a given circle, both worked out by square and compass, like other geometrical problems.

My strong opinion is, that on this line R, where a direct double significance is attached, with a point in geometry, there will be found the locality of a double set of chambers, and the starting-point will be the ante-chamber on both sides. It is only repeating what is on the story below, if we may make use of so familiar a term to express so great a scheme of construction.

As many of my readers can and will try the application of these lines, and those having space, would adapt that space to draw it out on a large scale; and, furthermore, to prove the correctness of the result of their endeavors, I will, for the uninitiated, give directions so to form a scale of inches to any size square, so that the truth of the whole may be tested. As the base side length, taken from Piazzi Smyth, is 9131.05 P. I., divide one side of your square, or the base of the Pyramid, into nine equal parts, leaving a residual of $100\frac{5}{16}$, or what would make a little less than an $\frac{1}{4}$ of one of those 9ths, then each of these 9ths would represent 1000 inches, so that you would have nine of these 1000ths, which, together with the residual, would be 9131 inches; thus you may, on a straight line, dot off some five or six of these parts, and divide one into ten parts for 100ths; thus you have a scale, for all practical purposes as close as any scale can be for so vast a building; and, if the diagram be correctly squared, and the angles correctly formed, according to the diagram in connection with this paper, the results will be in close proximity to the illustrations of Piazzi Smyth.

Thus the whole of the passages are determined by plain and simple geometry, independent of its mathematical results and great astronomical delineations; it is one gigantic pile of wonderful construction, not of necessity requiring any given measure, or set of figures, after the first setting out of its basal plain. Geometrically, any size would produce the same angles and slopes; but it requires the starting figures of cosmic commensurability to produce the great equations and mathematical results set forth by Professor Piazzi Smyth's work, 'Our Inheritance in the Great Pyramid.' And, there is little doubt, as far as my comprehension of the practical theory of construction is concerned, that if a space could be found sufficiently large to set out the base of the Pyramid, to prove these lines, to a scale of a sixteenth its full size, or about 48 feet for the base length, requiring a room or floor of about 50 or 60 feet broad by 100 feet long—under such conditions it is very probable these lengths could be tested with some degree of certainty, and so establish this problem in geometry as fulfilling the facts and figures so far known. At the present time many arguments are alleged for the different discrepancies in actual measurement, and not a few are the opinions put forth to account for these discrepancies by very logical arguments—one by a gentleman, Dr. Wood, of the United States, who argues that the excessive rays from a vertical sun for some 4000 years has caused the whole structure to warp, more particularly the south side, being more exposed,—and I am inclined to endorse that opinion, from what has come under my own observation under a tropical sun. Some attribute the cracks and kind of fissures now discernible to volcanic disturbances, and some to a settlement, but the many ages it has been acted on by the sun is the most practical theory. Under all these circumstances, if my lines are not so minutely correct, the practical working with the positive geometrical following on of the lines, and the results attained and demonstrated, are very remarkable.

I believe there is much more yet to be developed in this grand and noble pile of scientific skill and ability. The discerning eye and the practical man can now see by its construction what was intended by the Great Architect to be removed without disfigurement, so that in after ages the same may be said and applied to the top end of the grand gallery as is now said of the bottom end; that is to say, at some time or other certain stones were removed which disclosed the queen's chamber and passage-way, and the almost perpendicular shaft once covered by the ramp stone; but doubtless the whole, both before its removal and since, had its significance and meaning; and I contend this geometric development places these other chambers in position.

Now, brethren, to bring this vast matter of our ancient pedigree to a close, I would impress on you the dignity of our order, and proud, indeed, ought we to be as Freemasons to have the distinctive honor to be quoted as a fraternity emanating from so vast a seat of learning. Not, as I said in the outset of these annotations, would I detract one jot or tittle from the regal splendor of King Solomon's Temple, but rather add to its lustre by showing what wisdom and learning had preceded that historic time, and with the great wisdom with which King Solomon was endowed, and the resources at his command, those scattered elements of learning could be so collected, appropriated and concentrated on the Temple that nothing in this world could surpass it.

It is a grand pinnacle, my brethren, to exalt ourselves upon, and if those among us of a lethargic temperament can be induced to raise themselves to think more highly of the dignified status we have always held and been the custodians of, I again say, if I can actuate those of my brethren who think harshly of our ceremonies to investigate their precepts and teaching, and see the vast field we cultivate for wisdom and learning, then will my hopes be realized and the object of these annotations or essays be gained, for verily the Grand Geometrician of the Universe has not brought us along in history, and preserved our traditions for so many ages, that we should be despised and set down as babblers and heretics. I maintain that Freemasonry has achieved some of the most gigantic, and raised some of the most stupendous edifices on the face of this earth, and by the guidance of our Divine Creator there is much yet to be accomplished to fulfil our "allotted task." Freemasonry is inseparably bound up with the volume of the Sacred Law; on it our foundation rests, yet of itself Freemasonry is not a religion. It disseminates light like the sun, but while that great luminary lights but one half the globe at one and the same time, Masonry, with its effulgence, lights the entire universe and sends its rays of healing, consolation and good cheer, dispelling ignorance, superstition and error. To practice all the Masonic virtues would be attaining to a very high state of perfection, but it is not the regeneration of the heart by the Holy Spirit, nor does any of our ritual preach any such doctrine. "With the exception of Christianity, I know of no other institution in which benevolence so pure, and philanthropy so disinterested, are taught in obedience to the command of God; nor where, but in the volume of the Sacred Law, the social and moral duties are enforced by such awful sanctions as in the Lodges of the Brotherhood!" Who can thoroughly understand the moral mysteries, as well as those of art and science, which our legends unfold, and who has so laudable and high ambition to participate in the exalted sphere, with congenial associates, in that subtle communion and fraternization which genuine 'Sublime Freemasonry' is peculiarly calculated to afford." So mote it be.

GLIMPSES OF OUR CELTIC ANCESTORS BY EDWIN WILMSHURST RETFORT, NOTTS, ENGLAND.

INTRODUCTION.

As the following articles were written for publication in the *Banner of Israel*, a periodical advocating the theory that the British people are the ten tribes of the lost "House of Israel," it is necessary to explain that the writer has inferred that the Celtic tribes, whom the Romans found in possession of Britain, were descendants of Asiatic emigrants and of Hebrew descent.

Professor Rawlinson says that the Celts, who were the first people who arrived in Europe *from Asia, their birth-place*, pushed out the sons of Japheth, and, also, that a people known as Cimmerii, or Cimri, attained to power in Western Asia and Eastern Europe between B C 800-600.

From the "cities of the Medes," near the Caspian Sea (See II. Kings, xvii., 6), they migrated, and escaped over the Caucasus to the *Crimes*, thence to the *Cimmerian Land* of Herodotus, where now, in Wallachia the River Sereth runs into the Pruth. Pressed on by their kindred, the Scythian Sacai, the Cymry, or Cimmerii, migrated further to the *Cimbric* Chersonese (Jutland), from whence, always followed by the Saxons, they arrived in Britain, occupying the east and south coasts till the Romans, and afterwards the Saxons, pushed them to their present locations in Cumberland (*Cymry-land*) and *Cymria*, or Cambria, now Wales.

But the Sacæ, shown to be of the same ethnic stock as the Cimmerii, Cimri, or Cymry, also came into Europe *from Asia*, where they had seized the most fertile province of Media, called from *Sakasina*. Strabo mentions the 8th, and Herodotus the 7th century B. C. as the period of the first appearance of these Scythic tribes, the ancestors of the British race; and the 8th century B. C. was just the time when the kingdom, or "House of Israel" (as apart from the *Jews*), were deported to the cities of the Medes. Herodotus states that Media was *not* the cradle of the race of the Sacæ.

Moreover, the Danes and Normans, who followed them to Britain, were of the same original stock as the Sacæ and the Cymry, and we are driven to the conclusion that the Cimmerii were a branch of the Sacæ, that the Sacæ were kinsmen of the Danes, Jutes and Normans, and that *all* came from the identical part of Asia (Media) to which the ten tribes were carried and scattered by their Assyrian conquerors, as recorded in Hebrew chronicles, in one of the latest of which, written just before the captivity, they are called (Amos, vii., 16) the "House of Isaac," whence Sakai-Suna, or Sons of Sakai—abbreviated Saxons—"In *Isaac* shall thy seed be called."

PART I.

Before we approach the subject of the identity of the Britons with one fold of the lost sheep of the House of Israel, we must reject the popular delusion that the Cymry bore the same relation to the civilized Romans as the Australians, Mæoris, or Red Indians, bear to the English. The nomadic tribes who came west across Europe from Asia were not aboriginal (Japhetic) savages, but rather enterprising backwoodsmen, rough and hardy pioneers, who, for various causes, had left the teeming lands of Western Asia.

If a far future generation discovers in North America steel-polled axes of the best Sheffield make, they will probably argue that the first wave of Europeans came there with the

implements extant in their age; and the presence of implements of bronze (the production of civilized man) found in every part of Britain, and the fact that our ancestors used war chariots similar to those used by the civilized nations of Asia is an evidence that the British Celts, with whom the Romans came in contact, were survivals of colonies of civilized Asiatics of an age long antecedent to the Romans themselves.

The fact that Christianity was preached and received by them in the age of the Apostles shows that importance was attached to their conversion, and a passage from St. Paul's Second Epistle to Timothy calls attention to incidents interesting to Anglo-Israelites. "Eubulus greeteth thee, and Pudens and Linus and Claudia." Where now stands Chichester, the capital city, for the last 1,400 years, of South Saxons (Sussex) stood, in the first centuries of our era, the Celtic capital of the Regni (the opposite part of Britain to Gaul), which was, by Aulus Plautius, reduced into a Roman colony, and while a 'colonia' of veterans was quartered there, the historian Tacitus records: "A few States were given to the British chief Cogidunus, whom I, even, remember, a faithful ally to the Romans." To the present day, the Roman rectangular camp, which may be traced in the present configuration of the city, exists within sight of the Celtic circular stronghold, which crowns the summit of the "Trundle," the highest elevation of the surrounding downs.

It was the policy of the Roman Emperors to adopt into their families, or "gens," distinguished chiefs of subject nations, and there is little doubt but that Claudius Cæsar gave his name and protection to the British king, henceforth "Tib. Claudius Cogidunus," the females of whose house would hence be all "Claudias."

The Roman family of Pudentinus was of the highest senatorial rank; and, in the army of Plautius, it is believed his son commanded a cohort stationed at Regnum (now Chichester).

About A. D. 67, the epigrams of the poet Martial were all the rage in Rome, and from them we extract the following:—

O, Rufus, my friend Pudens marries the foreigner Claudia;
O, Hymen, be propitious with thy nuptial torch.

Elegantly rendered by Professor Plumptre,—

Claudia, the fair one from a foreign shore,
Is with my Pudens bound in wedlock's band.

And in a later epigram, when children had blessed the union, the poet continues,—

Since Claudia Rufina has sprung from the azure Britons,
How comes she to have the feelings of a Latin maid?

What grace and beauty! With the daughters of Italy, she may pass as a Roman; with those of Greece, as an Athenian matron, etc., or,—

Our Claudia, named Rufina, sprung, we know,
From blue-eyed Britons; yet, behold, she vies,
In grace with all that Greece and Rome can show,
As born and bred beneath their glowing skies.

It is as likely that the high-born Pudens married a savage when he chose the British maid with auburn locks (Rufina) to be the mother of his future patrician descendants, as that an English officer on service at the antipodes would disgrace his family by marrying an aboriginal woman; and the fact that Claudia Rufina rivalled the beauties of Rome in grace and elegance, is an evidence of the racial superiority of our Celtic ancestors, and possibly of a Roman education.

In A. D. 1723, in excavating a cellar at the corner of St. Martin's Lane and North Street, Chichester, was found the dedication stone of the Roman temple of Neptune and Minerva, stating that the land for the temple was voluntarily given to the College of Roman Artificers by Pudens, son of Pudentinus, showing that, in close proximity to the Celtic town of Cogidunus, a Roman officer possessed land, and that Roman culture

was strong enough then to induce a guild of artizans to come there to erect Roman buildings.

Dr. Stukeley, a savant of the period, believed the Pudens of the inscription to be the Prudens of the poet Martial, and husband of Claudia, the British maid; and, considering the small grasp of the island then held by the Romans, it is extremely unlikely that there should have been two Pudens, who each married a Claudia, and each, moreover, with golden locks.

But can we connect this Pudens and Claudia with those mentioned in St. Paul's epistle? And how and when did Paul of Tarsus become acquainted with them? And, moreover, where did they receive the sacrament of Christian baptism? We believe we can answer these queries satisfactorily.

LETTERS.

LETTER FROM S. G. ARNOLD.

Washington, March 12, 1884.

Dear Sir: I notice, from Piazza Smyth's article in the last STANDARD, that he commends, in no words of measured praise, the careful work of Mr. Petrie at the Great Pyramid. He says:

"The battery of scientific measuring instruments which he took out with him was more extensive than anything before known in that region, and had been in large part prepared for the occasion by his own hands with an acuteness and manual dexterity which cannot be too highly commended."

Mr. Petrie is a disbeliever in Mr. Smyth's theories, and the warm endorsement which his work has received from the Astronomer Royal is therefore the more noteworthy, and will give to his measurements a value in the eyes of the public which they would not otherwise have attained. As they are the latest and most accurate, and have been made with great care and labor and with the best of instruments, I was immensely interested to see what height he gave to the base side of the Pyramid, because none of the measures hitherto taken sustain the theoretic measures which were long since adopted by our Society.

According to Mr. Taylor's very careful investigations, the measures of the base side differ by about 70 feet. The most reliable may be re-stated in brief as follows: 693 feet, 728 feet, 746 feet, 763½ feet, 764 feet. Mr. Taylor explains these wide diversities by reminding the reader that the sides of the Pyramid incline inward and that the earlier measures were taken above the mountains of sand and debris which time has gathered around the building. The measures taken under the direction of Col. Howard Vyse in 1840, after the discovery of the casing stones and the corner sockets, are generally regarded as the most accurate and as approaching very nearly to the original model of the building.

But if there is disagreement in regard to the side of the base, there is no less disagreement in regard to the height. Indeed the height has been generally estimated from the base. The incline of the casing stones having been ascertained, the point at which the lines meet will be lower or higher, just in proportion to the size given to the base. Hence the height has been put at 478 feet, 480 feet, 490 feet, 486 feet, &c.

When it was discovered that the height of the Pyramid was intended to bear the same relation to the base as the radius of a circle bears to its circumference, the matter approached nearer to a solution but did not quite reach it. It could hardly be assumed that the proportions of this geometrical figure were accurately known at so early a period as

the building of the Pyramid. As it was not known to the Greek mathematicians of Alexandria, we would not expect it to be known two thousand years before. Mr. Taylor supposed that while the building was projected on that idea, the proportions had not been accurately ascertained. Hence the height could not be accurately ascertained from the length of the base side unless their formula was the same as ours, or we knew the amount of errors in their calculations. If their formula was erroneous and ours is correct, clearly they would not give the same results.

But in due time it was discovered that the different parts of the building had curious correlations. Among these none is more remarkable than the apparent relation between the length of the ante-room floor and the circuit of the base, the height of the building, and the diameter of the circle on which the building is supposed to be projected. And if it can be shown that these several proportions accord with the actual known measurements, all the problems are solved. Hence the very great interest that I felt in these latest and most accurate measures of the great building.

Allow me to go a little into particulars. The floor of the ante-room is said to measure $116\frac{1}{4}$ inches, plus. It may be 116.26 inches—a very curious and significant number which appears to be the key to all external proportions of the building. If you multiply it by 50 it gives the theoretic height, if you multiply it by 100 it gives the diameter of the circle which is supposed to circumscribe the base. If you multiply it by the formula in our arithmetics for deriving a circumference from a diameter, it gives the days, hours, minutes and seconds of our calendar year; and, by removing the point two places to the right or multiplying by 100, it gives the apparent circuit of the base. Such a combination of startling results could hardly be an accident, and hence our Society leaped at once to the conclusion that the results thus ascertained must certainly be those which the builder had in his mind when he "laid the measures thereof."

But there always has been a stern difficulty. All the actual measures were fatal to this theory. The earlier ones were altogether too small and the later and more accurate ones were too large. A theory that proves to be correct fits into all the circumstances and explains all the phenomena; but in this case the whole circuit of the base, as ascertained from the masonry line of the engineer, was some 16 feet or 192 inches too great, and we must either believe that it was incorrect or abandon our theory.

It is just this cloud that Mr. Petrie's measures have served to remove. As ascertained by his better instruments and more careful work, one side of the base measures 91.26 inches which accords almost exactly with the theoretic measure, and clears away all doubts which have beset our problem. The theoretic measure is, in fact, greater by only 5 inches. Besides, if Mr. Petrie is correct, it goes far to prove that the builders of the Pyramid understood the true relation of a circumference to its diameter. If we multiply 116.26 inches (the length of the ante-room floor) by 50 it gives as the theoretic height of the Pyramid 5.813 inches or 484 feet 5 inches. If you take this height and derive from it the circumference of the base, you will find it to be 36.524 inches, or, for one side 9.131 inches. We get this result by our formula. But if the builders of the Pyramid did not use the same formula, how does it happen that their work corresponds so exactly with the latest and best and most accurate measures?

Again, if the builders did not use the same formula as ours, how does it happen that the theoretic measure expresses so exactly the length of our calendar year. If you multiply the length of the ante room floor (116.26 inches) by the formula now in use for obtaining the circumference of a circle, the result will be as follows:

	3.1415927			
	110.26			
	188495562			
	62831854			
	188495562			
	31415927			
	31415927			
Days,	365.241567302			
	24			
	966269208			
	483134604			
Hours,	5.797615248			
	60			
Minutes,	47.856914880			
	60			
Seconds,	51.414892800			
	Days.	Hours.	Minutes.	Seconds.
Our calendar year,	365	5	48	46
Pyramid year,	365	5	47	51
Difference,				55 Seconds.

It will be observed that the figures which thus express the length of our calendar year also express the circuit of the Pyramid's base. But they require the removal of the point two places to the right. They are 36,524 inches, or, for one side of the base 9131 inches, being, as we have said, 5 inches more than the measure given by Mr. Petrie. The difference is just enough to show that there was no collusion, and the impression left on the mind of the thoughtful student is that the measures derived from the ante-room floor are those which the builder adopted, and that the little room in front of the king's chamber was so constructed as to record this key to the external measures of the great building.

S. G. ARNOLD.

LETTER FROM T. HOLLAND.

182 BROMPTON ROAD, S. W., April 15th, 1884.

Mr. President:—Yours of the 1st inst. just to hand, and I hasten to reply though I sent a diagram and slip, as per enclosed, a week ago, to Mr. Bisbee, thinking it probable the one sent to you was worthless as it is considerably in error, sending it away under some anxious haste to get it off my mind while shifting my residence. I think the diagram now enclosed is much more correct and produces many more facts geometrically, and of a practical character, mathematically I will not say. But, if my scale and compass principle produces a fixed height, and a circle struck from that height, the circumference of which is equal to four base side lengths, surely there is some ground for my conclusions, leaving the tests by trigonometry in more able hands. The other results from a following on of my lines seem to me remarkable, namely, the production of a circle equal in area to a given square, also a square equal in area to a given circle, and of different sizes, yet both required to complete the formation of the structure in a practical sense. I have a very high and distinguished respect both for Mr. Wood and Mr. Dow and their mathematical calculations, and it may be possible discrepancies may exist outside their gifted calculations—"Flinders Petrie" for instance. I will however leave the whole matter in your hands, and

I am confident my humble efforts will not only be safe, but judiciously applied if found worthy.

Yours most sincerely and respectfully,

THOS. HOLLAND.

I have made several of the enclosed diagrams to send here and there. They are on too small a scale for close testing, but answer the purpose to illustrate my meaning. I am sending to Piazzi Smyth, Mr. Biden, Mr. Homer, and others, before publishing.

T. H.

LETTER FROM REV. JAMES A. UPJOHN, IN REPLY TO MR. LATIMER'S INQUIRY AS TO HIS METHOD OF FINDING THE NUMERICAL VALUES OF SCRIPTURE NAMES.

Dear Sir: I began at the first word of the first verse of Genesis and counted the value of the first letter added it to the value of the second letter, and so on until I got beyond the cumulative number 888. If before that I found the cumulative number 666, I marked it. In some parts of the Bible I counted as far as 999, then I would begin as at first and count the first letter of the word next following the last word included in the first sum, and add to that first letter the value of the next, and so on until I had reached 888, or had found none there, and from that point I would start again counting as before. In this way I found many appearances of 888 and of 666. Of course when I saw an approximation or likelihood of the number I would examine more closely. I would always begin anew at each verse, when the verse preceding ended with a period. I do not think that many appearances were passed over, for I have frequently tried to find or pick out a 666 here and there and do not recollect finding any, in this way, which I have come across in the progress of my consecutive counting. There may be grammatical rules which would exclude some given *e. g.*, when the last word included in the 666 is in the construct state, having a termination different from its independent form. But these instances are comparatively few.

This 666 must be studied with a reference to Rev. xiii. 18. I think that the number as found on Pharaoh, Nebuchadnezzar and other Old Testament heathen kings gives us types of anti-Christian manifestations. A student of history could find the parallel between them and epochs and events which have occurred during the Christian era. But I believe that the number has a wider application: Thus its original reference is the *genus homo*, next, man in covenant with God, next, the powers in their relation to that man in covenant with God. The Bible concerns itself not with all men. It starts with Adam and Eve and gives us the names of three sons, Cain, Abel and Seth, but we must believe there were other sons as well as daughters. Then again it takes up Abraham and is occupied with the history of his descendants, and whatever accounts of other people came in are incidental as they are brought into relation with the Jews. I started with the intention of getting out a work on 888, which is a simple subject, but was turned off to 666, the reference, Rev. xiii. 18, leading me to believe that it would awaken more interest. There is a language in these numerally which can be used and understood universally. They are in language what uniformity in weights and measures would be if adopted by all people. I hope I have made clear some points, and if you find I can elucidate the matter at all, and have any difficulty to suggest, I shall be most happy to do what I can to remove the obscurity.

I thank you very much for writing, and send you a prospectus of 888 which may throw additional light on the subject.

Faithfully yours,

J. A. UPJOHN.

LETTER FROM REV. J. M. PERRY.

APRIL 12TH, 1884.

My Dear Sir: On receipt of your very welcome letter I immediately went over to Edinburgh to consult with Professor Piazz Smyth, and on his recommendation I applied to a shipowning friend of mine in Liverpool with the object of getting my instruments taken out to Alexandria and back free of all charge; and I am now happy to inform you that I can get this done provided the members of the expedition take their passage from Liverpool in the same steamer that takes out the instruments. This will, of course, very materially reduce the cost, and I should think that £50 or £60 would cover the expense of packing, carriage to Liverpool, and carriage from Alexandria to Cairo or the Great Pyramid, and erection there, together with the cost of bringing them home. I shall be glad if you will kindly give me the earliest possible notice of the starting of the expedition, as I shall have to get a new stand made for the great equatorial, and many other preparations to make. I suppose we shall all start from Liverpool.

I heartily reciprocate your kind wish to meet me, and trust that the time may not be far off when we shall be associated together in the Egyptian expedition, as I presume you will form one of the party.

The Scottish Astronomer strongly recommends that no attempt be made to take the great telescope to the top of the Great Pyramid, but that it be erected near the base. In this I think he is right, for although it would not be impossible to get it to the top, yet the expense of doing so would be so considerable, and the difficulty and inconvenience of getting up and down the Pyramid for the necessary observations would be so great, that it would very materially restrict its use, while the advantage gained would be *nil*.

Of course the great telescope will at all times be at the service of members of the expedition for viewing and examining celestial objects, but the work which I should propose principally to devote the instrument to is the measurement of double stars south of the celestial equator. Some time ago I mentioned the idea of taking out my telescope to Athens or Egypt, with this object, to the first double star observer in the world, Mr. S. W. Burnham, an American astronomer, no doubt well known to you. He strongly approved of the suggestion. The following quotation from his letter will be interesting:

"With respect to Athens and Egypt I have, of course, no practical information or personal knowledge, so you will make due allowance in considering my notion about the matter. On general principles I should select Egypt, where I should expect to find, for a portion of the year at least, a dry atmosphere and a rainless interval. These conditions I have found to be very important with respect to good seeing. You doubtless know what I have said on this subject in my report on the Lick Obs'y., and I have no doubt the statements there would hold good elsewhere. I should certainly select a place of that kind in preference to any other, after my experience in California. There is a further consideration which, other things being equal, would at once settle the question with me if I had any such trip in view, and that is the latitude. In Egypt, which is only about 30° north, you will have a splendid chance to work south, and further than any observatory in Europe or America can do. You will remember that at Mount Hamilton, in latitude 37° N., I could find new stars down to 45° S., or nearly that. With first class conditions you might expect to go to 50° S., one half of which will be almost new ground. Measures of stars there will of course be very valuable, for nothing practically has *ever* been done with the micrometer below 35°, and but little south of 20°. There is every reason for making the trip, if you can bring it about. I know of nothing that would be more interesting or profitable astronomically."

Of course, in writing this, Mr. Burnham knew nothing of the proposed expedition by the International Institute, nor did I when I received it, but his words show that useful

and important astronomical results may be reasonably expected from the use of such a telescope as mine for a few months in Egypt.

With kind regards, I am, my dear sir,

Yours very sincerely,

JEVON J. M. PERRY.

EXTRACT OF A LETTER FROM C. PIAZZI SMYTH.

APRIL 26, 1884.

Its advocates began this work by saying that the metre was founded on the ten-millionth of the quadrant of God's created earth; but they are now beginning to reveal their real design from the beginning—viz., to throw the earth, if they could, overboard, and make the standard of the metre the metre-bar itself, as made by Frenchmen, and kept in a building in Paris for all men to come there and bow the knee to it.

Had it not been for that, all President Barnard's vaporings about the length of the earth's axis being absolutely unknown, and that it will always be so, were as prejudicial to the metre founded on 1-10 millionth of the quadrant, as to the sacred cubit founded on 1-10 millionth of the earth's semi-polar axis.

But he cherishes the idea of the human-made bar of metal in Paris being made to rule the world eventually, without any reference to either God or the world.

Yours truly,

C. PIAZZI SMYTH.

EXTRACT OF A LETTER FROM J. N. WING, NEW YORK.

JUNE 2nd, 1884.

I confess that the metric men (in scientific circles) hold sway here, and it will be a long pull and a strong pull to gain the lead. I, of course, talk with many literary men, and the amount of ignorance and indifference the majority exhibit is wonderful.

I do have some hope that Lieutenant Totten's book will arouse some interest on the subject of metrology.

And in regard to the Pyramid, I find many well read people on most subjects, ignorant as to the commonest facts of the history of that wonderful monument, besides a large number totally indifferent regarding it. I am not by any means discouraged, for experience has taught me that all great movements have been carried to successful issues by often-times a mere handful of earnest workers. We have here, at least, two able, earnest laborers, Lieutenant Totten and Mr. Clark; men who will yet be heard far and wide in this fight with the metric men.

Yours sincerely,

J. N. WING.

EXTRACT OF A LETTER FROM J. L. DAMPIER.

APRIL 17th, 1884.

Shall He find faith on the earth at His second coming? The absence and want of faith will then be one of the sure signs of the times. Then let us take due warning, for the air is thick with doubts regarding things unseen and the inspiration of the Bible; fables and myths are the terms applied to many of the events related in the Old Testament, such as our *first* parents, the building of the Tower of Babel, &c. It is contended now to be discovered that the continent of America was peopled with a wondrous race thousands of years before "In the Beginning," and the account of the "Let Us make man," which is nothing but a fable or myth handed down from this wonderful race existing so many

many years before in "The Lost Atlantis," now re-discovered and brought to the light, to the light of man's understanding, so that he can see, touch and handle it, and therefore he believes, without the slightest doubt, forgetting that "Blessed are they who believe yet have not seen." They pretend to have discovered the origin of the whole heathen mythology, and that all the stories in the Old Testament are of the same class, naught but myths and fables—forgetting that all these ancient myths of Greece and Rome, in fact, throughout Europe and Asia, contain the Truth, but daubed over with untempered mortar, that true meaning and appearance has been obliterated and put to a wrong use. "The Serpent and the Cross" are worshipped—the created before the creator. The serpent and the cross may be traced in many of the figures and hieroglyphics of Central America. Part of the great continent they declare to have been inhabited thousands of years before Adam and Eve. All through India and China may be traced in their gods and temples, the "Serpent and the Cross," how and why is this? Because (as Dr. Seiss shows in his admirable work) God placed the same in the heavens "In the Beginning"—the twelve signs of the Zodiac, with their attending thirty-six Decans, instructing Adam in the same, thus handing down the future gospel, read in the stars above their heads, the Bible of the antediluvians, understood by Noah and handed down by him, and still carried on to the building of the Tower of Babel, when we know confusion took place, and the people departed covering settlements as God led them, carrying with them the Truth, which in time became hidden, worshipping in these Zodiacal signs the created instead of the creator. Let anyone compare the myths and gods of the heathen with these signs, and the fact is apparent from whence these myths have their rise—viz., from the Truth delivered "In the Beginning," and not Christianity from these myths.

Yours truly,

J. L. DAMPIER.

EXTRACT OF A LETTER FROM MRS. H. E. GODFREY.

MAY 1st, 1884.

The other day I sought an introduction to a lady who has a friend living up, in the mountains, almost to the eternal snow-line. For the last sixteen years he has been engaged in the study of the Bible. Six months of the year he is surrounded by deep snow. Living in his cabin all alone, he devotes this time to prayer and study, having no other books but the Bible. The result is something wonderful. How or why he was led to the study of the breast-plate of the High Priest I do not know.

Last winter he spent at Oakland, and directed an artist how to draw his charts, making them the exact measure of the described breast-plates. He arranges the names of the twelve tribes by the signs of the Zodiac, each sign corresponding [to the tribe, the month and the stone upon which the name was engraved. In the peculiar way in which the tribes are placed, many things are shown which have never been discovered and all correspond to facts. He explains how the Urim and Thummin pointed, and, the lady said, many other things which she could not convey, because she did not understand.

He has lived alone so long that he is not able to express what he wishes to convey. He wants his thoughts written out for a book and would have been glad to have had his brother, Judge Haven, do this, but his law business interfered. He went before the Congregational Club of San Francisco, explained his charts, and while talking, men rose to their feet interrupting him with objections; at the close, only one man expressed the opinion that there might be a great deal of truth in what he had shown, and for one he did not like to say there was none. I imagine, from what was told me, it was a bomb-shell among dry bones.

The little that was told me was so wonderful and glorious that I could not help thinking that if this information could be secured for the Institute, it might show a new way to

study the Pyramid problems. If so, there would be great significance to the command, "Look unto the hills, from whence cometh thy help, thy help cometh from the Lord who made the heavens and the earth."

Surely if there is an inspired measure this breast-plate, which was worn by the High Priest when he entered in before the Lord, must be superior evidence, particularly if the metric system cannot be applied to its size.

Yours respectfully,

H. E. GODFREY.

EXTRACT OF A LETTER FROM LIEUTENANT C. A. L. TOTTEN.

JUNE 1st, 1884.

I have Barnard's third article. It is weak. You will get copies soon. It issues in book form this week, I believe. It will do some harm, but not with those who read both sides of the question. He cites coincidence and gets up an imaginary Temple of Diana and a series of facts to match. I was waiting for the third article in hopes he would have some new facts to give and make some pointed arguments. But the whole matter is barren of interest to me, and his style mere denial and ridicule.

Yours truly,

C. A. L. TOTTEN.

EXTRACT OF A LETTER FROM JACOB M. CLARK, C. E.

Since I wrote you, I have seen Lieutenant Newburger of Elizabeth, N. J., a Hebrew gentleman, formerly an officer in the Prussian army, and afterwards in the American volunteers in the civil war, who has just returned from Europe. Before he went, I asked him to observe any facts he could, as to the usage of the *people* of the German States in adopting the French metric system.

He says that in ladies' dress goods, the French system is used. The reason is, that such goods are imported from France, and merchants and others simply follow the invoices as a matter of convenience. As to all goods manufactured in Germany, and as to other transactions among the people, they uniformly adhere to the "El" or "Elle," (the cubit of Ezekiel), and think of using nothing else, and this fact is very uniform throughout, except as to such matters of public record, &c., as are controlled by Government.

The last number of the Magazine was exceptionally good in all the articles. I was much interested in Redfield's, "The Altar and Pillar to Jehovah," and have read it again and again.

Sincerely and truly yours,

JACOB M. CLARK.

TRANSACTIONS OF THE OHIO AUXILIARY SOCIETY OF THE INTERNATIONAL INSTITUTE.

April 23, 1884.

Colonel M. B. Ewing, Cincinnati; Miss Wetherell, Nottingham, England, and P. W. Ward, Cleveland, were elected members at the meeting.

Mr. W. Le Cont Stevens, of Packer Collegiate Institution, writes :

Your journal impresses me as an attempt to unite two things that have no necessary connection.

1st. The preservation and simplification of units already in use.

2d. The reference of these units to the Great Pyramid, and the preservation of what Dr. Barnard has called the Pyramid Religion.

I find the names of such men as Hilgard, Rogers and Fleming, whose opinions I highly respect. While I have had no opportunity yet of finding out from these gentlemen what is the basis of their opposition to the metric system, I can readily imagine arguments, exclusively non-religious, that might have much weight with them, arguments quite independent of any assumed "earth commensurability" attaching to the standards now in use. The earth's polar radius is *deduced* from measurements in what Piazzi Smyth stigmatizes as mere outside rind, and any earth commensurability relating to the inch is as uncertain as that relating to the metre. That the metre is better than the yard as a standard I do not at all insist, but what we do need is definiteness, simplicity, decimal relations between initial and derived units, ready convertibility between those of length, volume, weight and value, without the slightest consideration for any imaginary inheritance in the Great Pyramid or anything else.

Pardon me for saying you have tied a heavy mill-stone about your neck in becoming sponsor for Piazzi Smyth. President Barnard's criticisms appear to be eminently sound. Professor Smyth's reputation as a man of cool scientific judgment, it seems to me, must be destroyed by his indulgence in such wild vagaries as I find throughout 'Our Inheritance in the Great Pyramid.'

Mr. Latimer in reply says :

You say our Magazine impresses you as an attempt to unite two things that have no necessary connection.

First—The preservation and simplification of units already in use.

Second—The reference of these units to the Great Pyramid and the preservation of what Mr. Barnard has called the "Pyramid Religion." If you have not observed from the reading of our Magazine the relation between the British units and those of the Great Pyramid, then you have read in vain. Most assuredly they are there, and moreover I have no doubt at all that we shall show more conclusively the earth commensurability of the British measures than has ever been proved for the French metre, which you know is not a ten-millionth part of the quadrant running through Paris as was intended, but that part of the quadrant passing through New York. There is an error of 1850 metres, probably.

As to Dr. Barnard's fling at Professor C. Piazzi Smyth and those who have followed him, in calling our work that of the "Pyramid Religion," it only shows the animus of every metric advocate that I have had anything to do with, as they always resort to ridicule to carry their point. I think that you will find that there is no uncertainty in regard to the commensurability of the inch with the earth's measure. I admit the ingenuity of the French system and the convertibility of its terms, but you could learn that as well with any measure you choose to use.

In discussing the letters Dr. Redfield said we should not repudiate the term "Pyramid Religion." We do not hold any religion in distinction from the religion of the Bible, but in corroboration of it. Those who believe that the Pyramid was built by Divine inspiration should accept the terms "Pyramid Faith" and "Pyramid Religion." Mr. Latimer said, "we do not object to the term, but to the derisive manner in which it is employed. I cannot doubt the inspiration of the architect of the Pyramid."

Mr. H. H. Pain, of the *Stock Exchange*, England, writes: "I am involved in an attack on the metric system. Mr. J. B. Brown has expressed his intention of giving me my 'quietus' next month, so could you send me some condensed pamphlets on the merits of the Anglo-Saxon weights and measures in order that I may meet my opponent's arguments."

Mr. J. B. Brown is a member of the London Chamber of Commerce, and also of the Tariff Committee of the British Chamber of Commerce in Paris. He is a zealous advocate for the introduction of the French metric system into England. He says: "The decimal system would save thousands of pounds sterling to English trade. The system is genius itself, a bit of real human inspiration."

In reply Mr. Latimer read an extract from John H. Felton's "Argument for American Consistency in the Extension of the Decimal Scale of Weights and Measures in Harmony with the National Currency." Mr. Felton gives a succinct account of the confusion and distress which prevailed in France when the metric system was introduced.

Dr. Redfield said there were many objections to a system exclusively decimal. The division of the months of the year must be duodecimal, and for many purposes an octonary division is preferable.

Mrs. W. A. Plumtre, England, sent the names of a number of persons interested in objects of the International Institute. She also enclosed an extract from an English paper relative to the work of Flinders Petrie for the Egypt Exposition Society.

"The great mounds of San, which mark the position of the once famous city of Tanis (the Zoan of our Bible), have been selected by the Egyptian Exploration Fund as their field of work during this present season. The many friends and supports of the Egypt Exploration Fund have good cause to be grateful to the Egyptian government and particularly to His Highness the Khedive, for granting them the exclusive right of digging at this site on the shores of Lake Menzaleh, in the Delta. It is also owing largely to the hearty concurrence of Professor Maspero, keeper of the Boulak Museum, that Mr. Flinders Petrie, the newly appointed agent of the Society, is now actually beginning the work of exploration. M. Naville, whose efforts for the work last year were so successful, though unable personally to superintend the excavations, has promised to edit any inscriptions which may be discovered."

Samuel Beswick writes on the same subject. He says: "Mr. Petrie was sent by the advice of the Royal Society. The district is near the place where the first battle of Tel Kebir was fought against Arabi Pasha. It is perhaps the most extraordinary spot in all Egypt, but it is a city of the dead. It was once a magnificent capital, more splendid in some respects than the ancient Thebes. This historic spot has now a terribly bad reputation for fevers, rain and despicable weather. It will be well if Mr. Petrie survives the isolation he will have to endure in this unhealthy district. The proprietors of the Boulak Museum undertook to explore it and found a vast treasure of broken obelisks, sphinxes, shrines, columns, beautifully carved and covered with figures and statues of gods innumerable. Some of these have been transferred to the Boulak Museum, near Cairo."

Mr. Latimer read extracts from a letter by J. Ralston Skinner and illustrated it by blackboard diagrams, but the letter in full was reserved for another meeting. Letters from Jacob M. Clark and J. N. Wing gave accounts of the meetings of the New York Society.

Mr. William H. Searles writes: "A friend of mine here, an experienced engineer,

spent two years in Mexico, where, of course, he had to adopt the metric system in all his work of railroad location and construction. He became heartily sick of that unit, finding it exceedingly inconvenient, both in horizontal and vertical measurements, and particularly in cubic quantities." Mr. Searles says: "The discussion of pyramid questions is rapidly spreading and taking in all classes of men. It is well that the subject finds opponents as well as friends, otherwise the development would not be healthy. We need have no fear of intelligent discussion of the whole question, as we desire to make no claims and to advance no doctrines which are not founded on truth.

Professor C. Piazzi Smyth also writes of the benefit we derive from opposition, and refers to the necessity for another Egyptian expedition.

John F. Shaw, of Toronto, Ontario, says: "I think that when the grand aims of the International Institute are more generally known, every thoughtful man in christendom will consider it an honor to become a member and thus assist in developing one of the most important movements of the age."

Letters were also read from Mrs. E. Jane Copeland, Bryantville, and Lewis Biden, Portsea, England.

A bronze medal of the centennial of the adoption of the great seal of the United States, was sent the Society by B. A. Mitchell, of Philadelphia.

May 7, 1884.

As Mr. Latimer was absent, Mr. A. M. Searles, Vice President, occupied the chair. Rev. L. C. Rodgers, Georgetown, Col.; William Ritchie, Sharon, Pa.; and George C. Mastic, Cleveland, O., were elected members.

Professor Alfred B. Taylor, of Philadelphia, wrote with reference to Mr. Holford's article in the *Tennessee Journal of Education* on "The Arithmetic of the Future." Mr. Taylor says: "Mr. Holford writes as though from the year 1976, the octonary arithmetic (with all its advantages) will be an accomplished fact. This is even earlier than I have prophesied for it [see my Reports on Weights and Measures, p. 91]. I there contemplate a century or two of obstruction and resistance but believe that what is truest, wisest, best, shall surely in the end secure its empire."

With reference to the "Metric Commission" in Washington, Jacob M. Clark says: "I have proposed to Totten to join him in a circular to be sent to as many as we know in Washington, with a view of effecting what we can. Will you and your friends West do something of the same kind?"

Referring to the proposed Egyptian expedition, Professor Edward R. Graham says: "If I could be of any service I would gladly accompany it without fee or reward. I cannot help feeling the 'granite leaf' has something important to reveal."

Edward Theodore Cooper, Omaha, Nebraska, writes on the same subject. He says: "I practiced as a surveyor for twenty years at the Cape of Good Hope under the British colonial government. The surveys as there conducted are trigonometrical, worked out from a measured base line. The system as there adopted would be the only one available in ascertaining the basal dimensions of the Great Pyramid. Professor Piazzi Smyth, on page thirty-nine of 'Our Inheritance,' is in error in his statement as to the expense to be incurred in the preliminary clearing of the ground from those obstructing rubbish heaps of broken stones. In a survey of the character now contemplated, little or no clearing of the ground beyond opening out or clearing the corner sockets would be necessary—a level piece of ground being found and cleared in the neighborhood whereon to measure a base line. I should willingly associate myself with any body of gentlemen whom your Society might organize for the purpose of fully carrying out the object you have in view."

Samuel Beswick, civil engineer, writes: "No effort should be spared to get up an American expedition at as early a date as possible. If the British leave Egypt anarchy will reign for a considerable time, and make it unsafe for any European or American to be there. The British exploration party are now at work on the east of Jordan; the Ger-

mans in Egypt and Jerusalem ; and Petrie was sent off in a hurry the very day on which his late work was published, showing that advantage is being taken of the present lull, lest another outbreak should destroy the chances for a year or two." Mr. Beswick suggests that the base of the Pyramid should be examined and measured by mining galleries or tunnels along the four sides ; he thinks that this would be less expensive and quite as effective as the plan of clearing the entire face of its rubbish.

Lewis Biden, of Portsea, England, says : " I have been equally pleased with yourself at the friendly feeling manifested lately between the better portion of the British and American people. I believe we are yet to become very closely allied on both sides of the Atlantic. There has been far too great an inclination to cultivate association with the French, who are totally unlike the English, speaking races in character and thought."

W. T. Alan, Greenville, Pennsylvania, writes with reference to his experiments with snow crystals. He has sent an article on the subject to the Royal Philosophical Society of Great Britain.

Professor W. A. Rogers, of Cambridge, Massachusetts, says : " I am having some new bars made of speculum metal. I shall try one of them for you. I can put lines of 10,000 or 20,000 to the inch on it. The surface will have a beautiful block polish and will not tarnish. I shall soon send you both the yard and one half yard bars."

Other letters were received from Thomas Holland, London, England ; Professor Asahel Abbott, Brooklyn, New York ; Mrs. H. E. Godfrey, Grass Valley, California ; J. L. Dampier, London, Ontario ; B. A. Mitchell, Philadelphia ; George Kellogg, New York ; Miss Emily Damon, S. Hanson, Massachusetts ; T. B. Mills, Las Vegas, New Mexico ; Rev. E. P. Ingersoll, Rosevale, Kansas ; and other members.

Lieutenant Totten sends three papers, " Notes of Pyramid Studies." The first, " Early tradition as to the object and builder of the Great Pyramid," show that books were written and traditions preserved from times prior to the deluge referring to the erection of an important document, which was intended to transmit valuable information down to a late posterity. These traditions come down to us from countries the most distinct and separate from each other, and through persons of almost all religions. Lieutenant Totten's other papers are " The Religious Theory " and " The Scientific Theory."

Lieutenant Totten's papers occasioned an animated discussion in which the principal speakers were Drs. Newcomer and Redfield and Mr. A. M. Searles. A paper was then read from Rev. Dr. Wild, Toronto, Ontario, after which the meeting adjourned for two weeks.

MAY 21st, 1884.

Rev. L. A. Lambert, Waterloo, New York ; C. A. G. Lewis and N. Raymond Chappell, New London, Connecticut ; F. N. Learned, of Pittsfield, Massachusetts ; John Heard, of Strathroy, Ontario ; and Henry Lowe, of Denver, Colorado, were elected members.

The President then gave an account of his western trip and spoke of the interest manifested by persons whom he met in the objects of the Institute, especially in the contemplated expedition to Egypt.

The subject of the " Metric Commission " at Washington was then discussed. A letter to Mr. Latimer from the Hon. B. P. Bland, Chairman of the Committee, was read. Mr. Bland says : " The Committee on Coinage, Weights and Measures have taken no final action upon the matter of the metric system and will hear you or other gentlemen upon the subject at such time as you may be pleased to present your views." Hon. O. D. Conger wrote on the same subject : " I have made inquiry of members of the Committee on Coinage, Weights and Measures and I learn that there is no probability of any legislation being reported at this session relative to the adoption of the French or other system. The Committee, however, meets on Wednesday of each week and a hearing can, no doubt, be readily arranged if you so desire."

A paper from Samuel Beswick, C. E., " The Standard Base of the Pyramids," was then

read by the President and illustrated by blackboard diagrams. In the discussion that followed Mr. J. H. Dow spoke in eloquent terms of the value of W. F. Petrie's recent work at the Pyramid. He then read a paper on the Pyramid and British inches, which was received with applause, and a resolution was passed that it should be published in the July number of the INTERNATIONAL STANDARD.

A letter from Mr. Beswick inclosed an extract relative to Mr. Petrie's present explorations among the ruins of Zoan :

" Apart altogether from the interest awakened by passing events in everything connected with Egypt, many will be specially pleased to learn that the ruins of Zoan, the chief city of the Egyptian Delta in ancient times, are about to be thoroughly examined by 'The Egypt Exploration Fund' Society. The excavations to be made are expected to yield a rich harvest in objects of Biblical and other historical interest. The lost histories of the Shepherd Kings, who are supposed to have ruled over Egypt for five hundred years, are generally understood to be buried under the mounds of Zoan. It is expected also that here there will be found documents bearing on the history of the Hebrews during the 450 years of their sojourn in the land of Pharaoh. In short, no site in Egypt, or indeed in the whole East, is known to be so rich in buried monuments as this. To carry out this exploration in a thorough and successful manner, from twenty to thirty thousand dollars will be necessary. Enough has already been subscribed to give the work a fair start, and accordingly excavations have already commenced under the superintendence of Mr. W. Flinders Petrie and of M. Naville, both well known as distinguished Egyptologists."

A paper from Professor Piazza Smyth, "The Earth's Axis of Rotation," was a reply to a statement of President Barnard in the 'School of Mines Quarterly.' President Barnard says "the length of the Polar axis of the earth is a quantity which may with strict truth be pronounced to be up to this time absolutely unknown." At the close of his paper he refers to the reformation of the calendar and the disturbance caused at the time of Pope Gregory's alteration. By a singular coincidence a letter on this subject was received on the same date from Professor F. Hess.

After a general discussion upon this subject letters from other members were read.

The meeting adjourned for two weeks.

June 4th, 1884.

Miss Oviatt and J. H. Holway, Cleveland ; P. H. Stewart, Cookstown, Ontario ; and Professor A. B. Hyde, of Allegheny College, Meadville, were elected members.

A letter was read from Jacob M. Clark, which gave some useful information with respect to the use of the metric system in European countries. Mr. Clark enclosed an envelope recently received from a metric advocate, which bore the inscription, "The adoption of the metric system, now making rapid headway in this country, will bring us into harmony with more than a score of nations, save millions annually in computations and a year of the school life of every child."

In connection with this subject we give some extracts from "The Decimal System," a work written some years ago by John H. Felton. Mr. Felton gives a graphic account of the distress and confusion that prevailed for forty-five years in France, in consequence of the introduction of the metric system. With respect to the "International Association," he says: "The orderly character of the decimal system, since its complete establishment in A. D., 1840, attracted the attention of foreigners visiting France. This circumstance aroused the ambition of the French philosophers, and induced them to attempt the extension of the metric plan. Meetings were called at various times, and communications addressed to foreigners of distinction, soliciting their influence in favor of the project. Such was the state of affairs in the autumn of A. D., 1855, when the great national exhibition attracted a large influx of foreigners to Paris. The friends of the metre, availing themselves of this favorable opportunity, convened a general meeting and formed themselves into a regular society, comprising all the foreigners of distinction that could be prevailed

upon to join them. The International Association aims at nothing less than the conversion of the whole world to the decimal system, through the medium of the metrical. The first is a good work and may be accomplished through the use of our present standards; but the establishment of the metrical system in all the nations of the earth is quite another thing. The *rod* of these wise men of France may become a serpent, but it will never swallow up all the standards in the world, after the manner of that of the great Jewish legislator. It has been suggested that the world would adopt the French scale of centimes and francs. We assume the boldness to state that as long as common sense presides at Washington, we shall never exchange our excellent scale of currency for any in the world. We now come to consider the metrical terminology abstractedly. All that we have said regarding its reception by the people of France will doubtless apply with equal force to the people of America. It would be a dangerous experiment. The length of the names, the novel and unusual sounds, the difficulty of recollecting their order and the time that must expire before they could be perfectly understood and correctly applied—all these objections and others not named would be found to render the whole catalogue as repulsive to our digestion as it was to that of the French. It is true they have survived the dose; but knowing their sufferings under its operation we prefer seeking a milder remedy for our commercial and social disorders. Besides our confidence, in the skill of their physicians has received a severe shock, from observing their serious errors, and the protracted sufferings of the patient under their hands. No, *messieurs*, we cannot take the metrical pill, although it is gilded with the attractive epithet of philosophical."

Valuable papers from Lieutenant Totten and J. H. Dow were read by the President. A paper from J. Ralston Skinner was held over for the next meeting. Letters were read from several members, and after a short discussion the meeting adjourned till June 18th.

MONTHLY RECEIPTS FROM SUBSCRIBERS TO THE INTERNATIONAL STANDARD, FROM APRIL 14TH, 1884, TO JUNE 9TH.

April—Mrs. E. D. Kimball, Salem, Mass., \$2.00; Rev. J. A. Upjohn, Neenah, Wis., \$2.00; E. L. Wilson, Philadelphia, \$2.00; S. A. Chaplin, Plymouth, Ind., \$2.00; P. W. Ward, Cleveland, \$2.00; Jas. F. Rhodes, Cleveland, \$2.00; Ole Olsen, Elgin, Ill., \$2.00;

May—Henry Lewis, Cleveland, \$2.00; L. Breckenridge, Cleveland, \$2.00; I. C. Brewer, Sandusky, O., \$2.00; Dr. J. W. Redfield, Cleveland, \$3.00; Cholmondeley Woodward, Barrie, Ont., \$2.00; Wm. Ritchie, Sharon, Pa., \$2.00; Thos. Wann, Cleveland, \$2.00; B. Saunders, Cleveland, \$2.00; Wm. Rundquist, Elgin, Ill., \$2.00; Jos. Hugill, Akron, O., \$2.00; C. A. G. Lewis, New London, Conn., \$2.00; N. Raymond Chappell, New London, Conn., \$2.00; John Heard, Strathroy, Ont., \$2.00; Rev. L. A. Lambert, Waterloo, N. Y., \$2.00; Public Library, Elgin, Ill., \$2.00; J. M. Durkee, Pittsfield, Mass., \$2.00; F. N. Learned, Pittsfield, Mass., \$2.00; Thos. Irvine, \$2.00; W. B. Chisholm, \$2.00; Wm. Chisholm, \$2.00; Capt. Frazee, \$2.00; E. W. S. Neff, \$2.00; F. Fitz, \$2.00; C. H. Schoenhut, \$2.00; P. M. Arthur, \$2.00; J. W. Richardson, \$2.00; J. F. Ryder, \$2.00; G. F. Ely, \$2.00; Dr. J. A. Stevens, \$2.00; W. F. Beecher, \$2.00; H. C. Ranney, \$2.00; Clark I. Butts, \$2.00; W. J. McKinnie, \$2.00; J. F. Holloway, \$2.00; W. U. Masters, \$2.00; all of Cleveland. U. S. Patent Office, Washington, \$3.70; A. S. C. Wurtele, C. E., Buffalo, \$2.00.

June 9th—Henry Snyder, Pittsburgh, \$2.00; A. A. Folsom, Boston, \$2.00; Rev. Samuel Studdjohn, Trenton, N. J., \$2.00; Rev. L. B. Hartman, Trenton, \$2.00; F. G. Darlington, Pittsburgh, \$2.00; W. L. Nicol, New York, \$2.00; Lewis Parker, Trenton, N. J., \$2.00; Hon. H. S. Little, Trenton, N. J., \$2.00; W. C. J. King, Barrie, Ont., \$2.00; Geo. Kellogg, New York, \$4.00; L. Biden, \$7.79; Rev. E. P. Ingersoll, Rosevale, Kansas, \$2.00; Mrs. W. A. Plumtre, \$2.44; W. B. Chapman, \$2.00; F. G. Williams, \$2.00; S. J. Miller, \$2.00; E. S. Page, \$2.00; Thomas Reeve, \$2.00; E. J. Leighton, \$2.00; N. P. Bowles, \$2.00; John Todd, \$2.00; Dr. Newcomer, \$2.00; Alexander Vance, \$2.00; Dr. R. A. Vance, \$2.00; N. B. Gray, \$2.00.

EDITORIAL NOTES.

As the historical portion of the article on "The Unveiling of Isis" was concluded in our last issue, the first part of the next series is postponed to our September number, in consequence of a press of matter.

Valuable papers from Lieutenant C. A. L. Totten, J. Ralston Skinner and Arthur S. C. Wurtele, C. E., arrived too late for this number of the Magazine. They will appear in the September number.

REVIEWS.

'NOTES ON PYRAMID STUDIES.' By Lieutenant C. A. L. Totten.

These notes are published as a series of articles in the *Hempstead Inquirer*. They contain much valuable information in a popular and interesting form. We have received nine articles, viz.: 1. Early Traditions as to the Object and Builder of the Great Pyramid. 2. Past and Present Literary Dignity of Subject. 3. The Leading Modern Theories on the Great Pyramid. 4. The Religious Theory. 5. The Scientific Theory. 6. The Geodesic Theory. 7. The Astrologic Theory. 8. Egypt, Gizeh, and the Pyramid's Orientation. 9. The Unique Geographical Position of the Pyramid—The Prime Meridian—Standard Cosmic Time. Complete sets of these papers can be obtained by applying to Lieutenant C. A. L. Totten, St. Paul's School, Garden City, L. I., N. Y.

THE RESTITUTION, issued weekly by the Christian Publishing Association, Plymouth, Indiana. Terms, two dollars per year, payable in advance.

The Restitution advocates the final "restitution of all things which God hath spoken by the mouth of all His holy prophets since the world began." As a means to this end, the establishment of the Kingdom of God on the earth, with the Christ as King of kings, the restoration of Israel, the literal resurrection of the dead, the immortalization of the righteous, and the final destruction of the wicked, eternal life only through Christ, and many other kindred truths.

I. In the first division of 'The Coming Age: Its Nature and Proximity,' the nature of the coming age is fully discussed as to its physical, moral and political character. In establishing the proximity of that age, the prophecies of Isaiah, Jeremiah, Ezekiel, Daniel, Zechariah, Christ, Paul, Peter and John, in his Apocalypse, are fully examined. Their Hebrew and Greek originals are compared, and their testimony critically noted relative to its rapid approach. It forms a complete text book of those prophecies which relate to a future age.

II. The second work is devoted to the investigation of the various phases of the Eastern Question: 1, The Egyptian phase; 2, The British phase; 3, The Russian phase; 4, The Ottoman or Turkish phase; 5, The Hebrew or Jewish phase; 6, The American phase, etc. Price of each work, \$3.00. They contain about 500 Royal octavo pages each. Send to C. H. Jones, 77 Clark street, Chicago, Ill.; to the Restitution, Plymouth, Ind.; or to J. P. Weethee, Millfield, Athens Co., O.

OUR REST AND SIGNS OF THE TIMES, published monthly by C. H. Jones, 77 Clarke street, Chicago, Ill. Terms, one dollar per annum.

Our Rest is strictly undenominational, but is a firm advocate of the inspiration of the Holy Scriptures, and of salvation only through faith in the atoning sacrifice of Christ.

The Youth's Examiner, published monthly by the above, endeavors to bring Bible truth before our children in simple language. Terms, forty cents per annum.

THE GOSPEL ACCORDING TO ST. MATTHEW. Translated from the Greek text of Constantius De Tischendorf and other standard textual authorities. By Charles Gardner, M. A. Printed on extra heavy, tinted paper, elegant cloth binding. Post paid, only sixty cents.

As the object of publishing this gospel was merely to show the style and design of the whole work, we will allow all those who purchase this book at sixty cents this amount of discount on the price of the whole new testament when completed. C. H. Jones, 77 Clark street, Chicago, Ill.

THE NUMBER COUNTED 666, AND THE NAME COUNTED 888, by the Rev. James Upjohn.

These books investigate the numerical values of names in the Hebrew Scriptures; they are companion volumes, price one dollar each. They will be sent postage paid by remitting the price to Rev. James A. Upjohn, Neenah, Wisconsin.



ROBERT MENZIES,

**The discoverer of Sacred Chronometric Metrology in the Great Pyramid:
Born in Edinburgh, Scotland, November 1833. Died at Almenia, Spain, 1878.**

THE
INTERNATIONAL
STANDARD

A MAGAZINE

DEVOTED TO THE DISCUSSION AND DISSEMINATION OF THE WISDOM CONTAINED
IN THE

GREAT PYRAMID OF JEEZEH IN EGYPT

SEPTEMBER, 1884

ISSUED BIMONTHLY. PRICE 36 CENTS

TERMS OF SUBSCRIPTION AND MEMBERSHIP, \$2.00 PER ANNUM IN ADVANCE

The International Institute as a body is not responsible for the facts or the opinions put forth by any of the writers for this Magazine.

All in favor of advancing truths most absolute, as portrayed in the revelations of the Great Pyramid of Egypt, and of the success of the Society in preserving inviolate the Anglo-Saxon weights and measures, will kindly communicate with the President, by whom also subscriptions, donations and communications will be gratefully received.

THE INTERNATIONAL INSTITUTE

FOR PRESERVING AND PERFECTING THE ANGLO-SAXON WEIGHTS AND MEASURES

CLEVELAND: 64 EUCLID AVENUE

INTERNATIONAL INSTITUTE FOR PRESERVING AND PERFECTING WEIGHTS AND MEASURES.

FOUNDED NOVEMBER 8, 1879.

CHARLES LATIMER, President, Cleveland, Ohio.
J. S. F. HUDDLESTON, Vice President, Boston, Mass.
LUCIAN I. BISBEE, Secretary, Boston, Mass.
G. R. HARDY, Treasurer, Springfield, Ma.

OHIO AUXILIARY SOCIETY.

CHARLES LATIMER, President. WM. H. MCCURDY, Treasurer.
A. M. SEARLES, Vice President. G. W. CROSSETTE, Cor. Secretary.
MARY B. SANFORD, Recording Secretary.

PUBLISHING COMMITTEE.

CHARLES LATIMER, C. E. } Editors. J. H. DOW. J. W. REDFIELD, M. D.
H. C. THOMPSON, } W. W. WILLIAMS. J. A. BIDWELL.
MRS. A. M. SEARLES. MARY B. SANFORD.

COMMITTEE ON STANDARD TIME.

REV. H. G. WOOD, Chairman of Committee, Sharon, Pennsylvania.
PROF. PIAZZI SMYTH, Astronomer Royal for Scotland, F. R. A. S., F. R. S. E., etc.,
Edinburgh.
M. L'ABBE F. MOIGNO, Canon of St. Denis, Paris, France, editor of *Cosmos Les Mondes*,
and author of "The Splendors of the Faith."
SANDFORD FLEMING, C. M. G., M. Inst. C. E., F. G. S., F. R. G. S., Ottawa, Canada.
WILLIAM H. SEARLES, C. E., Elyria, O.
JACOB M. CLARK, M. Am Soc. C. E., New York.
PROF. STOCKWELL, Astronomer, Cleveland, Ohio.
CHARLES LATIMER, C. E., Cleveland, Ohio.

WILLIAM W. WILLIAMS, PRINTER,
145 and 147 St. Clair Street, Cleveland, Ohio.

THE INTERNATIONAL STANDARD

SEPTEMBER, 1884.

THE GREAT PYRAMID AN EMBLEM OF THE UNIVERSE.

Editor of THE INTERNATIONAL STANDARD—Dear Sir: When you mathematicians and physicists have reached the end of your tether you will find yourselves all securely moored alongside of the good ship that bears our apostles and prophets. There are more allusions to the Pyramid in the Scriptures than have been heretofore conceived. Whether the followers of Enoch reared it, either in anticipation of the period when the Pleiades should culminate at the same time that Alpha Draconis looked directly down the descending way, or in commemoration of a period much earlier, when the crossed urn of Aquarius Aristæ was on the meridian; or whether it was built under the direction of Joseph when he was Zaphnath-paaneah in Egypt, and in commemoration of the Pleiadic-Draconian period; one thing at least is clear. It was designed to be a figure of the universe; and as this could be completed only when God should become fully manifested in the incarnation of the supreme Son and his triumph over the rebellion of angels and men that sinned in paradise, so the pyramid would remain

unfinished for ages, a true frustum, though lacking little of its proper height. It is to be noticed that while an opinion prevailed that the pyramids were found displeasing to God, yet in Egypt tombs were frustra of pyramids; in India the temples take qualified pyramid forms; and even in distant Astec land they were frustra of pyramids, like the Egyptian tombs—all evidently showing that the universe was not yet perfected in the appearance and works of the incarnate God. Hence both temples and tombs and perhaps altars were anciently left slightly truncated until the epiphany of the Mediator should be realized in the open and severe defeat of the enemies of God and man.

The pyramid form to temples and shrines was probably chosen as an emblem of the divine stability, and of these one of the most perfect seems to have been that by the Euphrates that lightnings melted to glassiness and earthquakes shattered the foundation near the coming on of the deluge that the Greeks of Hellas have named from Ogyges or Deucalion, from Helios or Perseus or Herakles, and the Alexandrians from Dardanus; others from Chronos, or Neptune, or Oannes, a corruption of the Hebrew Noah; the Sisuthrus, or Saturnus of the Assyrians as it comes to us in the Greek romances. Similar to this Bab-El, that Moses writes Babel, the Synchysis, or Confusion of the Septuaginta, because not divinely authorized, and therefore iniquitous, or a transgression, (Isa xxiv, 20), we find another, ascended by steps, at Cholula, in Astec land, and it is affirmed that others exist in the southwest of our American continent. The natives found here by the first Europeans affirmed that *their* ancestors had never used this for the purposes of divine worship, because pyramids had been found displeasing to the gods; a fact probably inferred from the divine visitation of the pyramid by the Euphrates, that was also heretical because reared of brick (Isa lxiv, 3), and not of more enduring stone. Many of our churches have pyramids upon their summits, and indeed our steeples are pyramids; and these are sometimes adorned with flames, probably to denote the presence in the sanctuary beneath of the pentecostal Spirit to sanctify and to save. In India for an emblem of the divine

stability they cut temples (sometimes whole groups of them) out of solid rock in a mountain side, and in that of Elephanta, near Bombay, there is, mounted upon pillars and the backs of elephants, at the entrance, a well-cut pyramid of granite 90 feet in perpendicular height.

As a pyramidal sanctuary is necessarily truncated for a place of sacrifice upon an altar, and perhaps of sacellae, or most holy places near it, so our Great Pyramid is found not yet pointed, but level at top, constituting it a true altar, without another or others with their sacellae, imposed still above; though this was rendered inaccessible from below by a smooth casing all the way down to the base, for the priest and the offering must descend upon this altar from heaven. Melchizedek rules in that Jerusalem which is from above, (Jerusalem shel me alat Kimchi) and comes down upon the mount of his glory to make an eternal expiation for them that are sanctified. Hence in Isaiah (xix, 19), we have a memorial pile (matsebah) that is also an altar (misbech) within the land, (bethok erets) and may signify, and commonly does mean, what is within a certain area and near its border; (aset gebulah) the very position of the Great Pyramid itself, that is within the land of Egypt and near its western verge, as well as not far from its northern extremity by the mouths of the Nile.

But as the Great Pyramid is an altar nothing can be more appropriate than that there should be within its sides below indications that the true basis of the altar itself is in eternal and unbending rectitude, while the ways that creatures will take may also be described by appropriate signs. Hence in its structure are indicated the measures of the solar system, for even Proctor will own that he has found in it the years of the equinoxial precession, though he is not willing to allow that it is indicated by the diagonals of the base.

As to the interior, so far as known, no one at all acquainted with symbology will doubt that we have both the downward tendencies of created things to their own impulses, and the upward tendencies of minds divinely touched; whereto correspond the material vehicles whereby minds make known their presence; for as the diamond is pure carbon so the spiritual body

of Jesus is pure humanity cleared of its dregs and viler impulses, and as his has become, after passing through death, so shall be the bodies of his saints in the resurrection world. In Menu it is well said, "This terrible world is ever sinking down into ruin;" and the worshipers of Krishna Jaganath say that he burned off both hands in lifting up the earth when it was sinking down into hell, and so his misshapen idol of mystic emblems in Orissa has no hands. The downward way in the Pyramid, commencing at a certain elevation in the side toward the north, well represents the downward course of created things and of men, whether in masses or separate; for the course of the individual forms that of the crowd acting together in mass. Man's first condition is one of elevation; he is not a semi-brute just created upright in shape or developed from apes, though we will not dispute Darwin or any of his disciples who affirm that *they* are so developed, for it is not in nature impossible, though in times known to Natural History, every seed possesses its own body and hybrids never propagate. There is in Chaldee tradition the period of omroka, (markich) the expanse, the primitive chaos, when all kinds of strange forms were mixed to form men and other animals, and these brutigenae may have then had an ancestry quite as brutish and as monstrous as they can desire. But the man that named animals on earth and the stars in heaven belongs to the historical race, and is our ancestor that received commission to treat apes and gorillas as his subjects and inferiors, and his natural elevation is well denoted by the elevation of the Pyramid entrance. But all history shows that man's course is downward, unless interrupted by divine influence; and so the first way in the pyramid leads downward to an unfinished chamber, with a possibility of continuing onward, none may say how far in utter darkness and in low places where there is no ascent.

But at a certain point another way springs upward, at first narrow; for the way of transgressors is not alone hard, though that of the just is hard only at the beginning, and it grows easier after we have proceeded a little way. This upward way leads toward an elevated place, where, upon the fiftieth course of masonry, opens the king's chamber, with its coffer, both

modules of just measures and weights. Here then is the object of the just man's way upon earth; he aspires to perfect justice and truth, and through some tribulation he shall enter the chamber of righteousness where he shall see the King in the beauty of holiness and be defiled no more with the influences of sin. At the entrance of the expanded way—the grand gallery—upon the 25th course, a level way leads to what is called the queen's chamber. This seems properly to relate to that class whose life is partly spent in non-progression, after they have begun to ascend toward the region of perfect rectitude. This class is unfortunately large in every age. They do not turn *back*, but *aside*, which for the time is little better; but they may at any moment return and ascend the upward way, though to their cost and delay and the loss of that crown of glory which the persevering and the diligent acquire. Immersed in the cares of business or study they neglect the uninterrupted pursuit after excellence which characterizes the truly wise who will attain to perfect sanctity and the true knowledge of what is supremely excellent of the Deity himself as revealed in his word and providence on earth.

Were there space it might be well to note how numbers are used in the inner ways and chambers of the Pyramid; as these, used artificially by the ancients, conveyed moral ideas and constituted a kind of stenography at once convenient and intelligible. In the queen's chamber 5 prevails; and it stands upon the 25th course of masonry: 25 being an intense form of law,—(52); they who choose that false rest, and care less to ascend with the progressive toward the heavenly and divine, being under fear of the law while they delay to ascend toward the just, the pure, the unearthly. In the ascending way and the king's chamber we find 7 (4+3) the Deity, a Trinal Unity, perfected by the incarnation for purposes of manifesting himself to the senses no less than the reason of the intelligent creation. Then there is 8, the sign of a renewed life, the resurrection, etc, with other numbers not necessary here to enumerate. To such as lack familiarity with numbers we commend the Palmoni and Mystic Numbers of Rev. Dr. Mahan, after Brown's Ordo Saeclorum; and after these the sections on

Numbers in The Tripod, as published in the 'Heir of the World' for 1882-3.

They who neglect taking the upward way toward the king's chamber, and proceed far down the easier, but still confined, downward course, till they reach the verge of the chamber of sorrow—the unfinished opening below—find no way to return, because of the steepness, the closeness, and the crowd coming down; but to these another way opens backward, somewhat steeper than that by which they ascended, and with extreme hardship they may reach the chamber of penitence, where they are confronted with an almost perpendicular ascent, that none can hope to overcome without help from above; and at the summit of this passage there is the appearance of a rock covering recently torn away, leaving behind a simple fragment cemented into the mouth of the well-like opening; and here they that are lifted out will find themselves at the foot of the grand gallery in the upward course toward truth and right, and happy are they if they be not seduced by love of ease to turn aside toward the queen's chamber of unrest.

Such, in brief, to one familiar with ancient symbols, are the interior ways and chambers of this amazing structure. But what correspondences are in it to Messiah and the Incarnation as revealed in the Divine Word? This has been in part answered already when we have spoken of it as an altar upon which he—the true Phœnix—descends for the immolation of himself that the world below may be expiated and delivered from everlasting fear.* The completion of the Pyramid then would signify the triumphant close of the mediatorial enterprise on earth; and this is the view customarily taken of it in the Scriptures at large. To this the author of the 118th Psalm looks forward when he says, "The stone that the builders rejected is become the supreme pinnacle." (*rosh pinnah.*) The builders set it at naught, not because they did not know its intention, but because they did neither wish that it should nor believe that it could be laid; the hells had no faith in the doctrine of an incarnate God as Lord of the world; but he becomes so at the end, when they have done what

* *Irrita perpetuâ solvent formidine terras.* Virg. Eclogue iv, 14.

they could to shew it impossible: it is a divine work, and a marvel to creatures. In that most mystic vaticination of Zechariah (iv, 7), where he is contrasting divine with human plans—true with false measures—it is said, “What art thou O, great mountain? Plane art thou to Zerubbabel; but he shall set up the supreme stone thereof with shoutings of Grace! Grace! before it.” The pile is level at top, but Zerubbabel—he that brings order out of confusion (babel)—is to finish it, as he has built it from the foundation (v, 9), and then shall they know that he is sent of God for his work—“it is the Lord’s doing, and it is marvellous in our eyes.” Some of the less informed have seen in “the stone that the builders rejected” the stone of Bethel, that the Jews named the foundation pillar of the temple, although it was used in the holy place as a stand for the censer when not in use; but its name indicates the possession of it to be essential to the existence of a legitimate temple or sacred enclosure, as it had been an heirloom in possession of some leading family of Jacob’s descendants, from his time to the reign of Solomon. That stone was one of the six things that were wanting in the second temple, and it has been ever maintained in the west that Jeremiah brought it, with other sacred things, to Ireland, in the time of Eochaid at that period Herimon or Head King of that island, who married Tamar, a daughter of Zedekiah that came in the train of the prophet from the east, and was crowned above that stone in Tara, to the disparagement of another stone formerly used as a part of the coronation seat. That stone of Tara was long after removed to Scotland, and then, centuries later, to England, where it can now be seen below the seat of the coronation chair in Westminster Abbey. It has the appearance of a stone partly fitted for building purposes, but left unfinished, and is now very much dilapidated and nearly broken in half.* From its being thus left unfinished and apparently thrown aside as unnecessary in the building of a wall, some have conceived the notion that this is the stone the Psalmist had in view; but this is shewn to

* Certain persons have said lately that this coronation stone is a piece of Scotch sandstone, and not like any stone known in Palestine. A skilful geologist, employed by Dean Stanley a few years since, could not determine to what class of stone it belongs; it is very old and dilapidated, badly fractured, with iron rings for handling.

be most unlikely, for the stone of Jacob was named a foundation pillar, while that in Ps. cxviii. is the supreme corner, the summit of a pyramid, and a pyramid in itself as to shape. In Isaiah (xxviii, 16) it is said, "One shall lay in Sion a stone, a stone well proved, a precious corner stone, a founding securely established." This stone is a pinnacle (pinnah) or summit; and St. Peter's paraphrase (I., ii, 6) is clearer still if possible, while he condenses and shortens the text, "Behold I lay in Sion a supreme corner stone (lithon akrogoniaion) * * * he that believeth in him shall not be confounded." This is the pinnacle of a prophecy in Zechariah (x : 4), and St. Paul refers to the same when he says, "We are built upon the founding of the apostles and prophets, Jesus Christ himself being the supreme corner, whereby the whole building fitly compacted together is become a holy temple for the Lord." So again in St. Peter (I., ii, 7) : "The stone that the builders disallowed, the same is made the head of the corner"—*i. e.*, the supreme summit, as "the forest of his Carmel" for Carmel the fruitful, abounding with trees; "the body of this death" for this dead body.

There are other references to the same idea we have found in Ps. cxviii. But by putting our conception of a corner stone as one in the foundation of a building for this constant summit stone of Hebrew usage, we have lost sight of the true sense of our apostles and prophets who had ever in view the completion of a pyramidal temple that cannot be ascended from below; and when, by one offering, are perfected all that be sanctified it shall be used no more for offerings, but it shall be built up into a corner so sharp that no bird can rest upon it forever.

There are other but less distinct references to this pile in our Scriptures. As among the Greeks a temple or place of oracles was at times a *petra* or stone,* so, in Hebrew, counsel (as strength and might, Prov. xl, 14: xxiv, 6) is a stone for duration and power of resistance. Messiah is "the stone—the Great Counsellor—of Israel"; (Gen. xlix, 24); and "the princes of Judah" among the apostles (Ps. lxxviii, 27: 28) are "their stone" or counsel, and this, for an emblem of strength, must have been

* Bryant I, p. 283.

pyramidal in form: a pyramid, in each case, is in the author's mind.

Thus the idea that the Great Pyramid is a figure of the universe to be completed in the advent and works of the divine incarnation is fully sustained, and is the only idea of it possible to an adept in oriental studies. Well has it been classed among the seven wonders, and its proposed completion is rightly named a marvel and wonder, the great wonder of time, divine, and not a human work. Hence, in Zechariah (iii, 8), Zerubabel and his mates are "men wondered at"; they personate Him, and their work is his, whose name is "Wonderful, Counsellor, the Mighty God, the Everlasting Father, the Prince of peace."

To preserve this immense pile for use in these last days of severe trial to faith, and to secure its contents from the violence of 4,000 years of war that were to come upon the earth, the entrance to our pyramid was concealed and its upward way blocked with loose-lying rocks. These were removed, after forcing a way below, by the Saracens, and the way to the king's chamber laid open for future explorers; and now it stands revealed as a central depository of correct measures to an age that can use them and needs them, and a people that can protect them from the ravage of future Vandals. Hebrew England now holds and must continue to hold Egypt for purposes more divine than human; let England guard this relic of far off ages when "science" was real as one of her choicest spoils won in her progress to an empire as extensive as the globe itself; and this shall be her glory and her joy

ASAHEL ABBOTT.

THE ALTAR AND PILLAR TO JEHOVAH.

VI.

For the sake of preserving a clear and comprehensive view of our subject in its general proportions, let me here remind my readers of the five parts into which it is naturally divided—1st, The Altar to Jehovah; 2nd, The Midst of the Land of Egypt; 3rd, The Pillar at the Border Thereof; 4th, The Purpose and Significance; 5th, The Being to Whom Dedicated. These parts being mutually dependent upon each other, so that neither one can be treated particularly without general allusions to the others, I ought to have stated at the outset (and perhaps would have done so but for fear of shocking seemingly established prejudices beyond endurance) what I thought might be given me to show under each division, namely: under the first, that the Great Pyramid is like what the altars to Jehovah were in the land of Canaan; under the second, that “the midst of the land of Egypt” is identical in place with what was once “the midst of the garden” of Eden; under the third, that the Hebrew word translated “a pillar” ought to be translated “an image,” as it is in several other passages, and here means the Great Sphinx; under the fourth, that the relation of the Great Pyramid to the Great Sphinx represents that of the earth to Leo, Virgo and Libra, and to the other signs of the Zodiac, as to a dial of the sacred chronology of the precessional cycle, in which it may be shown chronologically, as well as circumstantially, that the author of these two cotemporary monuments was Joseph, who substituted them for the tree of life and the tree of the knowledge of good and evil, to commemorate the brief sojourn of the church and the kingdom of the heavens in the Paradise on earth, and to prophesy their return to abide forever. Finally, I should have said that, under the fifth division of our subject, it might be given me to show that “Jehovah of Hosts,” to whom the Altar and Pillar are “for a sign and for a witness in the land of Egypt,” is THE SELF-EXISTENT

BEING; *essentially* the Divine Love and Wisdom; and *efficiently*, as the means to the end of their self-existence, the Universe of created existences, microcosmically represented in their one only perfect image and likeness, "their well-beloved and only-begotten Son," who, as the one only possible incarnation of "the fullness of the Godhead," constitutes the one only comprehensible Divine Trinity of the Father, Son and Holy Spirit, "from whom, through whom, and to whom are all things."

Of most of these propositions, if not of all, I may say to the majority of the readers of the INTERNATIONAL STANDARD, "Ye cannot bear them now;" but I trust you will bear with my endeavor to reduce them to the promised demonstration, until, in one or other of the two possible ways, "forbearance ceases to be a virtue."

I have still a good deal to say under the first division of my subject—the Altar to Jehovah. As a more scientific expression of the means by which the Great Altar of Sacrifice was converted into the Great Altar of Witness, I may say that the Great Pyramid was originally a treasury-stronghold, or mastaba, of the ordinary mastaba-angle of about 76° , and was converted into a monumental tomb, or pyramid proper, of the ordinary pyramid-angle of about 52° (or, more definitely, of its own exact π proportion, in which the angle is said to be $51^\circ, 51', 14''$) by such a superposition of masonry as was necessary to that purpose. If this statement be true, it is susceptible of demonstration. The supposition that a mastaba, in distinction from a pyramid, was a treasury-stronghold, in distinction from a monumental tomb, is supported by the following from 'Our Inheritance in the Great Pyramid:': "Besides the many early local traditions—which can hardly but have *some* foundation—of treasure having been deposited in the Egyptian Pyramids by kings who lived close after the flood, Colonel Howard Vyse and Mr. Perring (on pp. 45, 46, of the former's 3d vol. of 'Pyramids in Gizeh'), gave an account of a chamber in the great, terraced, and rather oblong Pyramid of Saccara, closed in the ceiling by a granite stopper, of the shape of what is employed in a 'stoppered' glass bottle of the present day, but of four tons' weight; and that peculiar chamber was confidently de-

clared by those authors to have been 'a treasury,' 'a secure and secret treasury,' and one that had certainly 'never been put to tombic use.'—(Chap. xviii, p. 409). This is a fair introduction to my idea that the Great Pyramid includes a great mastaba. If this supposition be correct, it constitutes a legitimate ground for inquiring whether it be not the true explanation of the dual description—"an altar to Jehovah in the midst of the land of Egypt, and a pillar at the border thereof to Jehovah, for a sign and for a witness to Jehovah of hosts in the land of Egypt." Not "a pillar," but "an image," (the true translation) may refer to "the Ancient of Days," which Mr. J. Ralston Skinner says means the Great Pyramid (see STANDARD, vol. ii, p. 188); or it may refer to the "one like unto the Son of Man," the description of which, in the Revelation, is very like that of the Ancient of Days in Daniel. But the question of this application of our text cannot be answered in the affirmative until the supposed duality of the Great Pyramid is proved a reality beyond the shadow of a doubt, and in this series cannot be properly discussed till we come to the 3rd division of our subject, *The Pillar at the Border Thereof*. Whether the Great Pyramid be dual or not, I am thoroughly satisfied that the "altar" and the "pillar" are not one and the same, but are one and inseparable, either by combination or by harmonic relation to each other, the one "for a sign," and the other "for a witness," memorial or monument to Jehovah, through all generations.

Now, if the Great Pyramid be of the two-fold character which I have ascribed to it, the fact must be discoverable in the structure itself. The gables of the king's and queen's chambers appear to be of the mastaba-angle, showing that these chambers belonged originally to a great mastaba. Moreover, the arch-mason did not cover up his great mastaba with his more distinctive pyramid-masonry without indicating the latter in distinction from the former by the pyramid-angle of the anticlinal stones over the doorway of the Great Pyramid, presenting the grandest gable of all, to be revealed at the right time by, that necessary, though criminal desecration, the removal of the beautiful casing-stones. Still another indication of the concealed

mastaba, and this a direct one, may possibly be found in the entrance passage, not far from the imposing entrance. The mastaba-angle, theoretically traced from the northern base line of the Pyramid, may be found to cross the descending passage at the junction of the great notched wall-stone with the double course of wall-stones, on a line parallel with the sloping roofs of the chambers on their north side, and not extravagantly far from parallel with the line of the ascending passage and grand gallery. Should it be found to do so, it may be worth while to remove the outer stones of the Pyramid to the depth indicated, to discover evidences of the mastaba-surface, carefully marking the stones in their removal, and as carefully replacing them, with a view to restoring the venerable pile, in the good time coming, to its pristine beauty and perfection.

When the great mastaba shall have been thus discovered, confirming what I have said of the traditional recognition of the Great Pyramid under the name of the Great Tower, it may be thought worth while to remove the stores of the Pyramid, within a circumscribed area, down to the terminus of the northern and lower of the two air-channels of the queen's chamber, for the purpose of confirming the common-sense idea that these channels were for ventilation, to make the chamber inhabitable by the "queen," or by whoever else may have had occasion to take refuge therein in the straitness of a siege. We may then conclude also that the air-channels of the king's chamber originally terminated at the mastaba-surface, but that when the mortal remains of the man whom the king made treasurer and ruler over all the land of Egypt were laid in the granite sarcophagus in the king's chamber, the air-channels of this chamber were extended with the superimposed masonry to the surface of the finished Pyramid to allow an escape of the mephitic gasses engendered by the decomposition. Believing that the air-channels of the queen's chamber were for ventilation, so long as this chamber was serviceable as a place of refuge, I must believe also that the comparatively thin wall-stones of this chamber, by which the inward extremities of the channels were closed for the chamber's exclusive devotion to treasures sacred to the immortal dead, and by which they con-

tinued closed until their discovery by Mr. Waynman Dixon in 1872, were introduced simultaneously with the superposition of the masonry by which the outward extremities of the air-channels were closed. By the internal and external stoppage of its air-channels, the queen's chamber was converted into a symbolic representation of "the house of Judah," the goats of the flock of the Good Shepherd, who has said of them that they "closed their ears, that they might not hear"; and by the extension of its air-channels to the outer surface of the Great Tomb, the king's chamber was converted into a symbolic representation of "the house of Israel," sometimes called "the house of Joseph," the people of whom the Good Shepherd has said, "My sheep hear my voice," and to whom He has so often addressed the distinguishing words, "He that hath ears to hear, let him hear." The fact of the dead body in the granite sarcophagus will appear no objection to this significance of the king's chamber, when we remember the words of our Lord, "The hour cometh, and now is, when the dead shall hear the voice of the Son of God, and they that hear shall live." The relation of this to the revival of "the dry bones of the house of Israel," before spoken of in connection with the transfer of the bones of Joseph from the "coffin in Egypt" to his "parcel of ground" in the midst of the dry bones of the slain in the valley of Shechem, is too obvious to need explanation.

According to the above speculations on the duality of the Great Pyramid, which I hope may be confirmed by the observations I have suggested, the builder of the Great Treasury-Stronghold was not the builder of the whole of the Great Pyramid, but must have left the design of the monumental part to be executed by Cephren, who survived him about 50 years. It is possible, indeed, that on the death of Cheops the prime minister of Cheops and Cephren executed his monumental design in honor of the royal dead, but in view of the evidence that Cheops was interred elsewhere, it is not probable that he did so. Of the actual fact of such a superimposed structure, and of a different hand in the execution of its design, there appears some evidence even in its orientation as compared with that of the structure so imposed upon. After showing that the primary

orientation was effected by means of the north star and the descending passage, Petrie says: "Considering, then, that the Great Pyramid core agrees with the passages far closer than does the casing, the inference seems to be that the casing was fixed by a re-determination of N. by the men who finished the building. These men had not the facilities of the earlier workers, and are shown by the inferiority of the later work in the Great Pyramid, to have been far less careful." ('Pyramids and Temples of Gizeh,' p. 126). If by "the Great Pyramid core" were here meant the part of the masonry extending outward from the "passages" to the mastaba-surface, and if by "the casing" were meant the part of the masonry extending inward from the Pyramid-surface to the mastaba, I could understand such a considerable difference between the orientation of the one and that of the other, the substantial core and the imposing shell having been constructed about 80 years apart, the one under the superintendence of the architect, the other only under the direction of his architectural design. To speak plainly, I think Jacob foresaw the great symbol of the Mediator between God and man only as Joseph was destined to leave it, a Step-Pyramid, with "the angels of God ascending and descending" its battlemented sides, representing the inductive and deductive movements of the Divine Love and Wisdom in the development and evolution of all things to and from the great First and Final Cause.

In a preceding article (No. IV) I accounted for the exceeding multiplication of pyramids in Egypt on the principle that the conversion of a Pharaoh's treasury-stronghold into his monumental tomb, on the occasion of his death, necessitated the building of another for the treasury and defensive purposes of his successor. In this I think I was right, but slightly mistaken in saying that "in this way the multiplication of pyramids only ceased with the complete subjection of Egypt to her foreign invaders." There was this other limit to the possibility of additional pyramids—namely, the limited area of Egypt's dominion on the west bank of the Nile, as well as on the east. Near approach to the southernmost boundary of western Egypt, irrespective of the alternating Memphian and Theban dynasties,

compelled the reconversion of monumental tombs into treasury-strongholds, and the reconversion of these into those, by the alternate imposition of the one form of structure upon the other, causing successive enlargements with the alternating proportions of the pyramid proper and those of the mastaba. Evidences of this dernier resort of military necessity are seen in "the sixth dynasty pyramids of Sakkara," which Petrie says are of a much lower grade of ascent than the fourth dynasty pyramids of Gizeh, those being mastabas, and these pyramids proper. Of the so-called pyramids of Sakkara and Medum he says: "Both these mastaba-pyramids are also peculiar in having been repeatedly enlarged. In no case have successive enlargements been found in a true pyramid; but both these structures have been several times finished, each time with a close-jointed, polished casing of the finest white limestone; and then, after each completion, it has been again enlarged by another coat of rough masonry, and another fine casing outside of the former casing. This explains how readily the Medum pyramid was stripped into a towering form; there were the older finished casings inside it; as soon as the later coats were stripped off, the older surface was revealed again." ('Pyramids and Temples of Gizeh,' p. 148).

Now, in my estimation, this remarkable fact of the successive covering of a mastaba by a pyramid, and of a pyramid by a mastaba, in the case of the so-called step-pyramids of Sakkara and Medum, adds not a little to the reasonableness of believing that each of the three Great Pyramids of Gizeh includes a mastaba, the altar stairs of whose four sides were once builded upon in a manner suited to a military defence of the treasures within. On this theory, the vast height between the king's chamber and the apex of the Great Pyramid *par distinction* is easily understood without the necessity of supposing an undiscovered chamber in the midst. It is to be looked upon as purely monumental, and to this end microcosmic and macrocosmic in the highest possible degree in its grand superposition of masonry, Heaven's most significant means of converting the Great Tower into the Great Tomb, or the Great Altar of Sacrifice into the Great Altar of Witness, a memorial forever of the

life-long self-sacrifice, by which the architect became the most perfect type of the incarnate Jehovah and Saviour of mankind that the world has ever known. And supposing the architect to have inscribed this Great Memorial Altar with the name of the Being to whom he consecrated it, we see the best of reasons for this name having been revealed to Moses in the remarkable language in the third chapter of Exodus: "And God said unto Moses, I AM THAT I AM; and he said, thus shalt thou say unto the children of Israel, I AM hath sent me unto you. And God said, moreover, unto Moses, Thus shalt thou say unto the children of Israel, THE JEHOVAH ELOHIM of your fathers, the God of Abraham, the God of Isaac, and the God of Jacob, hath sent me unto you; this is my name forever, and this is my memorial unto all generations." These words were addressed to Moses "out of the midst of the burning bush," at "the mountain of God" called "Horeb," in which was the cave where Jehovah afterwards manifested himself to Elijah "in the still, small voice." I imagine Moses looking, with entranced vision, from the burning bush and pyramidal mountain at the inscription on the glowing face of the Great Pyramid, and hearing Jehovah say of it, "This is my name forever," and of the Great Pyramid, "This is my memorial unto all generations." Moses was familiar with the inscription, but till then had been ignorant of the meaning of it, as the Egyptian priests continued to be; and he was not afterwards allowed to reveal more in regard to it, and in regard to the altar on which it was inscribed, than is recorded in the text, for the simple reason that the full import of his message to the children of Israel was reserved for the fullness of times.

From the midst of the burning bush the unconsumable Jehovah said to Moses, "Certainly I will be with you; and this shall be a token unto thee, that I have sent thee; when thou hast brought forth the people out of Egypt, ye shall serve God upon this mountain." In fulfilment of this prediction, God brought Moses from the Great Pyramid, which Mr. Skinner explains to be the "*Rock at, or out of Water,*" or the "*Water out of the Rock,*" or what is meant by the word *Egypt*, back to the Sinaitic Peninsula, or land of Midian, and stood "upon the

rock in Horeb," while from the cleft in its smitten side flowed the water of life for the thirsty people, of whom and of the rock Paul says, "They drank of that spiritual rock that followed them, and that Rock was Christ."—(1 Cor. x., 4.) "They were all baptized into Moses in the cloud and in the sea," because Jehovah, in a pillar of cloud by day and of fire by night, leading them from "the Rock out of the Water" to "the Water out of the Rock," led them due east, on the thirtieth parallel, through the baptismal font, to symbolize "the straight and narrow way that leadeth unto life," in contradistinction from the way by which their fathers went down into Egypt, symbolizing "the broad road that leadeth to destruction," from which the multitudes of mankind are to be saved through the instrumentality of "the chosen seed."

To return to the message of Jehovah to the children of Israel by the hand of Moses. It is easy to see that the phrase "I AM THAT I AM," or simply "I AM," is equivalent to *self-existence*, or *absolute being*, and that this is what is meant by the name "Jehovah," or, according to the Samaritans, "Jahvah," the most probable derivation of which is said to be "from JAH, the *Essence*, and HAVAH, *Existing*." Whether this be the correct derivation or not, the name is that by which the children of Israel were thenceforth to recognize "the God of Abraham, the God of Isaac, and the God of Jacob," as the divine trinity which they were required to worship and serve, in distinction from that of the Egyptians, the worship and service of which they were required to abandon. By "the Jehovah Elohim of your fathers" is meant, according to literal translation, neither more nor less than *the Self-Existent Gods of your fathers*; and this implies the circle of Self-Existence handed down to us through the old philosophers, *i. e.*, "Cause, Means, and End," in the divine trinity of "Father, Son, and Holy Spirit," of which the Father is "the God of Abraham," the Son "the God of Isaac," and the Holy Spirit "the God of Jacob." In agreement with the first named relationship is the pre-eminently fatherly character of Abraham, as well as the meaning of his name, Abram, *High Father*, and Abraham, *Father of a Multitude*; in agreement with the second is not only the meaning of the name

Isaac, *i. e.*, *Joy* ("for joy that a man-child is born into the world"), but also the singular fact of Abraham's sacrifice of his only begotten son and heir, under the symbol of a lamb, upon the altar on Mount Moriah; and in agreement with the third relationship is not only the meaning of the name 'Jacob, *i. e.*, *Supplanter*, signifying the comparatively feminine character of this patriarch, in respect to his methods of successful competition with the predominantly masculine character represented by Esau, but also his exceeding spirituality, and his entranced and ecstatic conditions, in which "the Mighty God of Jacob" appeared to him in the form and character of "an Angel," reminding us of the omnipotence of the gentle and regenerating influences of the Holy Spirit, and of all those maternal and heavenly attributes which are so fitly symbolized by the dove. The Divine Son was, is, and ever will be the divine paternal means to the divine maternity, and is included in his beginning and end, none the less for being their most perfect embodiment, for the simple reason that the means is eternally and of necessity included in the First and Final Cause. Thus "the Gods" of Abraham, of Isaac, and of Jacob, are seen to constitute the Self-Existent Being, the triune Jehovah; and seeing that this name was revealed to Moses, by a clear explanation of it, in order that "the Gods of Israel" might be "forever" distinguished from all "other Gods," how can it be otherwise than wrong to translate "Jehovah Elohim" by the words "LORD God," and to substitute "Lord GOD" for "Lord Jehovah," merely hinting at the true translations by underscoring "LORD" in the one case, and "GOD" in the other? To me, this persistent determination to suppress and circumvent a great and obvious truth, and that truth the most vital and salvatory truth of the Bible, is something astonishing.

But what about Jehovah's "memorial to all generations?" Is it his name, which he so impressively announced to the children of Israel? or is it his Great Memorial Altar, on which his name might have been inscribed? I take it to be the latter, because several memorial altars, besides this greatest of them, are spoken of in the Bible, while it is only the commentators who speak of a "memorial name." They say that the question,

“What is his name?” refers to his name alone, and that, therefore, his answer to it can refer to nothing else. But suppose the name to have been inscribed upon the Great Memorial, and that thereby Moses and the children of Israel were familiar with it without knowing its meaning: in this case, the “name” and the “memorial” were not one and the same, but one and inseparable, so that mention of either, to be in the highest degree intelligible, necessitated mention of the other. By analogy with the altar named “El-Beth-el,” with the one named “El-Elohe-Israel,” and with the one named “Jehovah-Nissi,” I now think that the inscription on the “Altar to Jehovah in the midst of the land of Egypt” was “JEHOVAH ELOHIM,” rather than “SACRED TO JEHOVAH.” And let me ask those who look upon the Great Pyramid as the Great Memorial Altar, “for a witness to Jehovah of hosts in the land of Egypt,” how they can so regard it without believing, or at least admitting the rationality of the belief, that the inscription upon its pure white surface was the name of the Being to whom it was dedicated, and to whose attribute of self-existence, as symbolized in “the tree of life in the midst of the garden,” it was “a witness,” a “memorial to all generations?” Is not this vastly more consistent with their belief in the divine origin of the Great Pyramid than the notion that the inscription upon it was the modern “hieroglyph of *degrees, minutes, and seconds,*” recording some one or more of those mathematical and astronomical relationships which the architect had already recorded in the parts and proportions of the structure, external and internal, to be unfolded to their interior perception through the enlightening influences of the Spirit of Truth? The geometrical character of the Great Pyramid was sufficiently obvious to need no written indorsement; but in the physical sciences, even in the sublimest of them, men do but grovel, unless elevated by a high religious sentiment; and hence the appropriateness of the inscription, JAHVAH ELOHIM, or JEHOVAH ELOHIM—a name in which are just as many letters as in the motto, “ANNUIT CŒPTIS,” and as many as there are “signs of the times” in that circuit of the heavens which is alluded to in the mandate,

“Extol him that rideth upon the heavens by his name JAH, and rejoice before him.”—(Ps. lxxviii., 4)

Jehovah's message to the children of Israel through Moses, calling them from idolatry to the worship of himself, was echoed in the far off ages by David, in the words, “Thy name, O Jehovah, endureth forever; and thy memorial, O Jehovah, throughout all generations.”—(Ps. cxxxv., 13.) Here the “name” and the “memorial” are still more evidently distinct and yet most intimately related. That the message was prophetic, as well as historic, we see in its allusions to the future, as well as the past. It was as true of David's time as of that of Moses, and it is as true of our time as it was of David's. That it was a call from slavish idolatry, and that it was the very beginning of Israel's knowledge of Jehovah, is evident from this in Ezekiel: “Thus saith the Lord Jehovah: In the day when I chose Israel, and lifted up mine hand unto the seed of the house of Jacob, and made myself known unto them in the land of Egypt; when I lifted up mine hand unto them, saying, I am your Jehovah Elohim; in the day that I lifted up mine hand unto them, to bring them forth of the land of Egypt into a land that I had espied for them, flowing with milk and honey, which is the glory of all lands; then said I unto them, cast ye away every man the abominations of his eyes, and defile not yourselves with the idols of Egypt: I am your Jehovah Elohim.” (xx, 5-7.) It is remarkable in this passage that the lifting up of the hand, which is “a witness” or “memorial to all generations” of the faithfulness of the Almighty to his promises, is mentioned, in a painstaking way, just as many times as there are persons in the Divine Trinity, “the God of Abraham, the God of Isaac, and the God of Jacob;” and it makes me think that, in addition to the symbolization of the Divine Trinity in the Great Pyramid, there may also be an allusion in it to the three “high places,” *Aramæus, Ammosis, and Inaron*, the first built by Joseph, the second by Moses, and the third by Aaron, (See STANDARD, vol. ii, pp. 26, 27); for Joseph said to his brethren, “God hath made me a father unto Pharaoh;” Moses referred to himself as a type of the Son of God in the words, “Jehovah thy God will raise up unto thee a Prophet from the midst of thee,

of thy brethren, like unto me ;” and Aaron was “the mouth,” the voice, the breath of Moses, reminding us of the words of our Lord, “When the Spirit of Truth is come, he shall guide you into all truth ; for he shall not speak from himself, but what things soever he shall hear shall he speak ; and he shall declare unto you the things that are to come. He shall glorify me ; for he shall take of mine, and shall declare it unto you.”

In Daniel vii., 18, the words translated “the Most High” in the text, are in the margin translated, “*high ones, i. e., things, or places.*” They refer to the Divine Trinity, under the symbol of the three Great Pyramids of Gizeh, do they not? The *Most High*, who is also called “the Highest,” is JAH, the essential divine, *i. e.*, the Divine Father, and certainly appears to be sometimes spoken of under the symbol of the highest of the three great Pyramids ; as we see in the words, “He that dwelleth in the secret place of the Most High, shall abide under the shadow of the Almighty. I will say of Jehovah, He is my refuge, and my fortress: my God ; in him will I trust.”—(Ps. xci., 1, 2.) In the 9th verse of the same psalm, David says, “Because thou hast made Jehovah, which is my refuge, even the Most High, thy habitation, there shall no evil befall thee, neither shall any plague come nigh thy dwelling.” Of the same import is the first verse of the Psalm entitled, “A prayer of Moses, the man of God,” which says, “Jehovah, thou hast been our dwelling place in all generations.”—(Ps. xc.) It apparently refers to the one great “Memorial unto all generations,” as that on which was the name pointed out and explained by Moses to the children of Israel in Egypt. Indeed, in this very inscription, “Jehovah Elohim,” the Egyptian priests, by a perversion not altogether strange, may have read their own Hermetic trinity of “End, Cause, and Effect,” under the names of Isis, Osiris, and Horns, when they said to Herodotus that it signified “the number of radishes, onions, and garlicks eaten by the workmen ;” for these plants had a sacred significance in the eyes of the Egyptians, by virtue of which the eaters of them symbolically appropriated the divine attributes ; somewhat as in the unfermented bread and wine of the passover Christians

symbolically appropriate the body and blood of the Lamb of God, the divine wisdom and love of their risen Lord.

The Great Memorial is also called after the name inscribed upon it, *i. e.*, "Jehovah," by the prophet Hosea, where he says of Jacob, "Yea, he had power over the angel, and prevailed; he wept, and made supplication unto him: he found him in Bethel; and there he spake with us, even the Jehovah Elohim of hosts; Jehovah is his memorial."—(xii., 4, 5.) The memorial here mentioned can hardly be mistaken for its name, and can, therefore, hardly be mistaken for the name of the Being memorized by it. Remembering that Jacob wrestled with the angel in vain for his name, though successfully for his blessing, and that Bethel was the place of Jacob's prophetic vision of the great stairway from earth to heaven, with the Jehovah Gods of Abraham, of Isaac, and of Jacob speaking to him from the top of it, the statement of Hosea that "there he, even the Jehovah Elohim of hosts, spake *with us*," and that "Jehovah is his memorial," becomes very significant. It suggests "our inheritance in the Great Pyramid." The plain inference is, that the name for which Jacob prayed in vain was revealed to the builder of the Great Step-Pyramid of Gizeh, to be inscribed by his direction on the finished pyramid, the Great Memorial Altar, and that the builder was Jacob's heir to the vision, with all the divinity and universality involved in the elaboration and embodiment of it. If it be said that the Almighty announced himself to Jacob as "Jehovah, the God of Abraham thy father, and the God of Isaac," and that Jacob is reported as saying, "Surely Jehovah is in this place and I knew it not," I reply that we are to understand such statements of Moses (if they are his) in a manner consistent with his report of this express declaration of Jehovah to himself, "I appeared unto Abraham, unto Isaac, and unto Jacob, by the name of God Almighty; but by my name Jehovah was I not known to them."—(Ex. vi, 3.) It is commonly thought that the place where Abraham sacrificed the ram instead of his son he called "Jehovah-jireh," to commemorate the fulfillment of his answer, "My son, God will provide himself a lamb for a burnt offering:" but the Hebrew of "God will provide" is "Elohe-jireh," not "Jehovah-jireh;" and this leads

me to suspect that the name Jehovah, wherever it occurs previous to Ex. iii., 15, was surreptitiously introduced by some over-zealous transcriber of the time of Ezra, in the supposed interest of monotheism. The name is absent from all the poetically inspired utterances of the book of Genesis, because with these the transcriber did not dare to interfere. In Jacob's death-bed inspiration, following his invitation, "Gather yourselves together, ye sons of Jacob, that I may tell you what shall befall you in the last days," he makes mention of "the mighty God of Jacob," of "the God of thy father," and of "the Almighty," all in the blessing pronounced upon Joseph: but not once in the entire prophecy does he name the name of Jehovah; and why not except that it had not been revealed to him? The inference is, that if it was revealed to anybody before Moses, it was revealed to Zaphnath-paaneah, "which in Coptic signifies *a revealer of secrets, or, the man to whom secrets are revealed.*" "The good will of him who dwelt in the bush" was shown to Moses in the revelation of his everlasting name in connection with his "memorial unto all generations;" and for this good will Moses blessed Joseph, showing, I think, that we may bless him for "our inheritance in the Great Pyramid."

J. W. REDFIELD.

OUR NATIONAL MOTTO—"E PLURIBUS UNUM."

To those who have a mind to observe the distinctive characteristics of our Nation which mark the difference between it and the other nations of the earth, and who can discern something of the deep significance of the symbols adopted at its beginning to set forth its high purpose and mission, there comes a growing conviction that more than human wisdom directed that little company of men in the choice of emblems that should fitly represent this Nation among the nations of the earth.

In the Bible are these words written by the prophet Amos (Amos iii: 7): "Surely the Lord God will do nothing but he revealeth his secret unto his servants the prophets."

Therefore, with confidence, we may look into his word to find from whence came this people, and what he has said concerning them.

Let us take our national motto, "*E pluribus unum*," whose meaning is, of many, one : because, this people is *one* GREAT NATION, composed of MANY INDEPENDENT NATIONS or States, confederate.

Let us compare this with what God said to Abram, and see if it may not be that the United States is the nation and many nations promised to him ; and, if so, then God's people Israel, and heirs to the inheritance promised to him and to his seed.

There are many writers, to-day, in our own country and abroad, who are asserting that England is Israel, the "great nation and company of nations"; but, knowing we came of the same people, and are a great nation, they seem to be of necessity compelled to allow us some place, and by tracing the birthright promise down to Joseph's two sons, they find Ephraim to be the greater, and Manasseh the smaller, and have assumed England to be Ephraim and the United States to be Manasseh, claiming the greatness of the blessing given to Abraham as England's alone.

Let us begin with Gen. xii, and examine carefully, and see what God says : "Now, the LORD had said unto Abram, Get thee out of thy country, and from thy kindred, and from thy father's house, unto a land that I will shew thee, and I will make of thee a great nation, and I will bless thee, and make thy name great ; and thou shalt be a blessing, and I will bless them that bless thee, and curse him that curseth thee ; and in thee shall all families of the earth be blessed."

Again (Gen. xvii), "When Abram was ninety years old and nine, the LORD appeared unto Abram, and said unto him, I am the Almighty God : walk before me and be thou perfect, and I will make my covenant between me and thee ; and will multiply thee exceedingly. And Abram fell on his face : and God talked with him ; saying, as for me, behold, MY COVENANT is with THEE, and thou shalt be a father of many nations, neither shall thy name any more be called Abram (High Father), but thy name shall be called Abraham (Father of a multitude), for

a father of MANY NATIONS have I made thee, and I will make thee exceeding fruitful, and I will make nations of thee; and kings shall come out of thee, and I will establish my covenant between me and thee, and thy seed after thee, in their generations (their literal seed) for an EVERLASTING COVENANT, to be a God unto thee, and to thy seed after thee, and I will give unto thee, and to thy seed after thee, the land wherein thou art a stranger, all the land of Canaan, for an everlasting possession; and I will be their God."

It is afterward affirmed to Isaac, in these words, (Gen. xxvi :3) : "Sojourn in this land and I will be with thee, and will bless thee; for unto thee, and unto thy seed, I will give all these countries; and I will perform the oath which I swear unto Abraham thy father, and I will make thy seed to multiply as the stars of heaven, and will give unto thy seed all these countries, and in thy seed shall all the nations of the earth be blessed."

Afterward it is reaffirmed to Jacob, in these words (Genesis xxviii), "I am the LORD, God of Abraham thy father, and the God of Isaac: the land whereon thou liest, to thee will I give it, and to thy seed: and thy seed shall be as the dust of the earth; and thou shalt spread abroad to the west, and to the east, and to the north, and to the south" (this spreading abroad was not accomplished at the time the twelve tribes dwelt in Canaan). "And in thee and in thy seed shall all the families of the earth be blessed, and behold, I am with thee, and will keep thee in all places whither thou goest, and will bring thee again into this land: for I will not leave thee until I have done that which I have spoken to thee of."

(Gen. xxxv, 9-12), "And God appeared unto Jacob again, when he came out of Pana-aram, and blessed him; and God said unto him, Thy name is Jacob; thy name shall not be called any more Jacob, but Israel shall be thy name; and he called his name Israel (*i. e.*, Prince or God). And God said unto him, I am God, Almighty; be fruitful and multiply: a NATION and a COMPANY OF NATIONS shall be of thee, and kings shall come out of thy loins; and the land which I gave Abra-

ham and Isaac, to thee will I give it, and to thy seed after thee will I give the land.”

In after years when the time drew nigh that Israel must die (Gen. xlviii), “Jacob said unto Joseph, Now thy two sons Ephraim and Manasseh, which were born unto thee in the land of Egypt, are mine.” And Israel stretched out his right hand and laid it upon Ephraim’s head who was the younger, and his left hand upon Manasseh’s head, guiding his hands wittingly: for Manasseh was the firstborn, and he blessed JOSEPH, and said, God, before whom my fathers Abraham and Isaac did walk, the God which fed me all my life long unto this day, the angel which redeemed me from all evil, bless the lads and let thy name (Israel) be named on THEM, and the name of my fathers Abraham and Isaac; and let them like fish grow into a multitude in the midst of the earth, and when Joseph saw that his father laid his right hand on the head of Ephraim, it displeased him; and he held up his father’s hand to remove it from Ephraim’s head unto Manasseh’s head, and Joseph said unto his father, Not so, my father; for this is the firstborn; put thy right hand upon his head, and his father refused and said, I know it, my son, I know it: he also shall be great: but truly his younger brother shall be greater than he, and his seed shall become a MULTITUDE OF NATIONS.”

Before the children of Israel went out of Egypt, God said to Moses (Ex. iv: 22), “Thou shalt say unto Pharaoh, “Thus saith the LORD, Israel is my Son, even my firstborn.”

After they were delivered from Pharaoh and led through the wilderness into the land of Canaan, and had become a kingdom in that land, in about 975 B. C., they were divided and became two kingdoms—the kingdom of Israel and the kingdom of Judah. While in this condition, in about 740 B. C. came Tiglathpileser and took Naphtali, Reuben, Gad and half tribe of Manasseh and carried them away into Assyria. In about 719 B. C. the King of Assyria beseiged Samaria, and carried Israel away into Assyria. “So all the house of Israel were carried away into Assyria,” from thence they were to be scattered and spread abroad.

As they are not remaining in that land, the next thing is to

find whither they are gone. God had said by the Song of Moses (Deut. xxxii: 26), "I will scatter them into corners, I will cause the remembrance of them to cease from among men,"—and by the prophet Amos he said (Amos ix: 9), "I will sift the house of Israel among all the nations, like as corn is sifted in a sieve yet shall not the least grain fall upon the earth." Here is a declaration that though their nationality should become lost to the world and to themselves, yet God would know every one of them; and we find he had appointed a place where they should be found.

By Jeremiah he says, (Jer. iii: 10-12.) "Go, proclaim these words toward the north, and say, return thou back-sliding Israel, saith the LORD; and I will not cause mine anger to fall upon you, for I am merciful saith the LORD, and I will not keep anger forever: only acknowledge thine iniquity, that thou hast transgressed against the LORD, thy God, and hast scattered thy ways to strangers under every green tree, and ye have not obeyed my voice, saith the LORD." His word by Isaiah concerning their return gives another point of location: (Isa. xlix)—"Behold these shall come from far, and lo, these from the north and from the west" and again by Jeremiah: "Behold, I will bring them from the north country, and gather them from the coasts of the earth." Hear the word of the LORD, O ye nations, and declare it in the Isles afar off, and say, He that scattered Israel, will gather him, and keep him as a shepherd doth his flock."

Follow these directions from Jerusalem, where the prophets stood, and it brings you to the northwest coasts of Europe and the British Isles.

In the blessing pronounced by Moses upon JOSEPH, he said: (Deut. xxxiii: 17.)—"His glory is like the firstling of his bullock, and HIS HORNS are like the horns of the unicorn, (or as Smith's dictionary gives it—the wild ox or buffalo; and refers to the two tribes which sprang from one—*i. e.*, Joseph; as two horns from one head) with them (the horns) he shall push the people (banished Israel) together (not apart) to the ends of the earth, and they (the horns) are the ten-thousands of Ephraim, and they are the thousands of Manasseh."

Those writers who have claimed that England is Ephraim, and United States, Manasseh, have separated the people belonging to the two sons of Joseph:—1st, by a great ocean; 2nd, by a different form of government; 3d, they have not observed the blessing of Jacob, as given in Gen. xlviii: 16, when he said, "Let my name (Israel) be named on them, and let THEM grow—as fishes do increase—into a multitude in the midst of the earth."

In the words of an American statesman, this nation is "a clasp between Europe and Asia" (Charles Sumner, Aug. 1, 1853). In the language of an American historian, it is "a Colossus that will grasp Europe in one hand and Asia in the other."—(Draper's "Civil War in America," vol. 1, page 183.)

The same writers, to show that Ephraim and Manasseh are to be separated, say that England (as Israel) was to lose United States (as Manasseh), and quote Isa. xlix: 20, "The children which thou shalt have after thou hast lost the other, shall say again in thine ears, 'The place is too straight for me: give place to me that I may dwell;'" thus appropriating to England the comforting words spoken by the LORD to Zion.

This xlixth chapter so full of love and tenderness to the lost people of Israel, does not forget Zion—their ancient land—their desolate heritage, and addressing her, under the figure of a woman mourning for her children that are lost, who in her grief has said, "The LORD has forsaken me, and my Lord has forsaken me," reminds her that, strong as is her love and compassion for her children, there might be a possibility of a mother forgetting even her own son; then in these very touching words the LORD says to her, "Yet will I not forget thee: Behold, I have graven thee upon the palms of my hands: thy walls are continually before me, thy children shall make haste, thy destroyers and they that made thee waste shall go forth of thee, the children which thou shalt have after thou hast lost the other, shall say again in thine ears, 'The place is too strait for me, give place to me that I may dwell.'"

We have heard the word of the LORD saying, "He that scattered Israel will gather him;" but has he told us how, or by whom? Yes! To Israel, who have been "pushed together

to the ends of the earth," who are lost and know not they are Israel, are addressed these very impressive words, "Listen, O Isles, unto me, and hearken ye people from far: the LORD hath called me (meaning Jesus) to bring Jacob again to him."

And when Jesus appeared on the earth we hear the response from his lips (Matt. xv: 24), "I am not sent but to the lost sheep of the house of Israel." (John x.)—"I am the good shepherd: the good shepherd giveth his life for the sheep. My sheep hear my voice, and I know them, and they will follow me.

And for this purpose the gospel of Jesus Christ was preached by Paul to the Gentiles, that the "glad tidings" might reach Israel. He says (Rom. xi.), "For I speak to you Gentiles, inasmuch as I am the apostle to the Gentiles; I magnify my office—if by any means I may provoke to emulation my flesh and might save some of them; for I would not, brethren, that ye should be ignorant of this mystery, lest ye should be wise in your own conceits, that blindness in part is happened to Israel (the Jews) until the fulness of the nations be come in, and so all Israel shall be saved: as it is written, 'There shall come out of Sion the Deliverer, and shall turn away ungodliness from Jacob.'"

The gospel can be traced in its course to where God located Israel—in the isles and coasts of the earth; whence arose great persecutions on account of the opposing elements in the nations with whom Israel was mixed.

In the process of time came the fulfillment of this message to Israel by Jeremiah (Jer. l.): "Remove out of the midst of Babylon, and go forth out of the land of the Chaldeans, and be as the he goats before the flocks." (I read in a paper not long ago, "Farmers use goats to protect their sheep from dogs; two goats can drive away a dozen dogs, and two are about all a farmer puts in with his sheep; as soon as a dog enters the field at night, the goats attack him, and their butting propensities are too much for the dog, who soon finds himself rolling over and over: a few repetitions drives the dog from the field.")

Our Pilgrim Fathers are well identified by this peculiar expression of the goats, for they prepared the way before the flocks that have ever since been coming.

Now, let us turn to Daniel and see what God has made known to him about his chosen people. We find (Dan. ii), "In the days of those kings" (represented by Nebuchadnezzar's image) "shall the God of heaven set up a kingdom, which shall never be destroyed." Is there such a kingdom which has for its government the principles of God's law?

We see the great nation composed of the many nations; and we are sure God brought this people here. We have seen those men assembled in Independence Hall, Philadelphia, signing their names to the Declaration of Independence, appealing to the Supreme Judge of the world for the rectitude of their intentions, and for the support of this declaration, with a firm reliance on the protection of Divine Providence, mutually pledging to each other their lives, their fortunes and their sacred honor," owning no king but Jesus Christ, who said, "All ye are brethren."

We find still further that Daniel was told, "Many shall be purified, made white, and tried." Now, if this Nation comprises the "many," were not our father's purified? Were they not even called Puritans? Did they not come here that they might have liberty to worship God? Is not this pure? And were they not made white in the framing of the Declaration of Independence, when they say, "We hold these truths to be self-evident, that all men are created equal; that they are endowed by their Creator with certain inalienable rights; that among these are, life, liberty and the pursuit of happiness."

Jesus said, "One is your Master, even Christ, and all ye are brethren." Is not this principle white? and was not our nation tried on this very principle in the late civil war? Verily we are the "many," and we are the one great nation—the kingdom set up by the God of heaven: not that we are ALREADY perfect.

Jesus said (Matt. xiii), "In the time of the harvest the Son of Man shall send forth his angels, and they shall gather out of His kingdom all things that offend and them which do iniquity; then shall the righteous shine forth as the sun in the kingdom of their Father."

And as we are the many nations in one, we must be the ten thousands of Ephraim and the thousands of Manasseh—the house of Joseph.

Jacob in blessing Joseph said: "From thence is the shepherd, the stone of Israel."

And the LORD says by Isaiah, "Cyrus is my shepherd" (Isa. xlv). "I will loose the loins of kings to open before him the two leaved gates, and the gates shall not be shut." (May not this refer to the two granite leaves in the Great Pyramid?) "And I will give thee (Israel) the treasures of darkness, and hidden riches of secret places, that thou mayest know that I, the LORD, am the God of Israel."

EMILY DAMON.

METROLOGISTS OF THE INSTITUTE.

Four years and a half ago, to-wit., the 17th December, 1879, this Society took the first step toward "Perfecting our Weights and Measures." At that time a paper was presented by Mr. George C. Davies, under that title, in which a review of our tables of weights and measures was given, and an attempt made to bring order out of chaos by striking out all the superfluous terms, that like barnacles had been engrafted on the system by the countless ages and peoples making use of the inch as its unit of measure. Not only were these superfluous terms to be stricken off, but it was recommended to drop entirely all measures of capacity, and sell all commodities by the pound of 7,000 grains. It was also recommended that Troy and Apothecary weights be dispensed with, and the grain made the unit of weight, and the inch the unit of measure. Should these suggestions be carried out we should have one set of measures—namely, the inch, foot, yard and mile—for all dimensions, whether linear, superficial or solid; one set of weights, namely, the grain, pound, kentle of 100 lbs., and ton of 2,000 lbs. for all commodities, whether solid, fluid or dry; one set of measures for land, based on the unit above given—being the same as now used, as all such measures have since the beginning been subjects of record, and cannot be disturbed.

The different multiples and subdivisions of the terms given above may be made either by eighths, quarters and halves as now, or decimally, as may be preferred—though it was recommended that the pound should be divided into 10 parts instead of 16 for the convenience of accountants, as well as ordinary traders.

Carrying out a system based on these suggestions the student would have only the following terms to charge his memory with, namely:

For extension—inch, foot, yard, mile,	4
“ weight and capacity—grain, pound, kentle, ton,	4
In all,	8

The multiples and subdivisions being always given in simple arithmetical terms known to every school boy or girl in the land. This would seem to be about as simple a system as could well be devised, and with the advantage of being based on our well known system. It has not, however, met with favor from the metrologists of this Society, or of the International Institute—most of whom seem to think that an ideal system must be evolved from the old, forgetting apparently that the mission of the Society is to “preserve and perfect the weights and measures in use.” They seem also to forget the measures of the Pyramid were limited to two—the inch and the cubit—though authorities differ very greatly as to the length of the cubit. As it was probably a multiple of the inch, it would be well for improvers to limit themselves to the original unit.

There seems also to be a strong conviction in the language of the Chairman of the Society's Committee on Weights and Measures that “*We must have a decimal system*”—“or be compelled to adopt the metric system.” Now it will be unnecessary to discuss this question, for it seems perfectly clear that no power on earth will compel the Anglo-Saxon race to discontinue the use of the inch, foot, yard, mile, or the grain, pound and ton—none of which are decimal to the others. It may consent, and has practically so consented for many years to divide these quantities decimally. If this be true, and I think the experience of ages will bear out the assertion, what is the

use of bothering our brains about a decimal system, based on our old units, or any other?

Again, the metrologists of the Society seem to think that a separate name must be had for each separate multiple or subdivision of the unit, hence we have an array of new terms such as podes, decapodes hectopodes, kilopodes and other "heathen Greek" terms requiring a special effort of the memory to recall. These special terms are the *bete noir* of our present system and are answerable for the confusion now existing. Besides, what is the use of these special terms, anyway? With the eight terms given above, namely, inch, foot, yard, mile—grain, pound, kente—which may be dispensed with—and the ton, the dimensions, weight or capacity of any physical substance or extent can be easily or accurately determined to the minutest fraction, and in language taught daily in every school-room in the land. If gentlemen wish to try their hands in devising a system of weights and measures, let them start out with a new unit and build up a new system upon that. They will be much more likely to achieve success in that direction than in attempting to decimalize the old, and, too, with the almost certain result that their fine drawn theories will be entirely ignored by the people.

Could the Society realize the fact that the easiest and shortest way to dispose of the French metric system will be to memorialize Congress to make the Anglo-Saxon weights and measures above named the legal and only standards of the country in the way proposed in a paper read before the Society in 1882, and published in the second volume of the Society's Proceedings, and enforce their memorial with all the social influences of the Society, I think we should cease to hear of the French metric and its zealous advocates, for we have the people with us.

GEO. C. DAVIES.

PYRAMID STUDIES.

Mr. Flinders Petrie persists in maintaining that the base side (9068.8'' \pm .65) at the *pavement* level is the only real one intended to be monumentalized by the architect. He ignores the four horizontal and larger squares below it, severally indicated most plainly by the four socket levels, so carefully placed at different depths upon the fundamental diagonals. Now, of course, with all other true Pyramid-students, I believe that the sides of the four squares indicated by the sockets are of immense importance, and am disposed to believe that in the several articles published in the last numbers of the STANDARD we are placed upon the right track for their due interpretation. Nevertheless this *pavement* base length must not be overlooked. It was, as a line, perhaps the most notably defined base of the whole monument. Can it be $\frac{28500}{\pi} = 10000 \times \frac{1}{2} (5.7) \div \pi$? Is it 100 times the coffer's length? or whence was it derived? It certainly must have a simple π relation.

Be this, however, as it may, I am pretty well convinced that the *displacement* of the entrance axis east of the central vertical plane of the Pyramid is a direct π function of this pavement base line. This displacement is given by Petrie as 287.0 \pm .8 E (page 55). Again, on page 65, where he locates the axis of the south end of the ascending gallery, in the same plane, he gives it as 187. \pm 1.5 E. Divide now 9068.8 \pm .65 by 10π and you have 288.66 +, a quantity close enough to indicate that the *theoretical* displacement is $\frac{1}{10}$ the pavement base $\div \pi$.

Again, Petrie gives the displacement of the end of the descending gallery south of the pavement base as 2907.3 \pm .6, a quantity which looks like 9131.05 $\div \pi$.

The main point in all of these displacements is to get the true, theoretical function for the pavement base. The value in British inches is undoubtedly around about 9068. $\mp x$, and the main question, therefore, is, what the absolute form of the function is?

There is one other question about which I want to say a word. It is upon the little note published in the last STANDARD, over Mr. Dow's name, entitled, "Prove all Things."

Now, while Mr. Dow is manifestly correct in his conclusion that, so long as the Pyramid is what may be termed a π -pyramid, "the so-called 10 to 9 slope of the corners of the Pyramid is a falsity," it by no means follows that whatever the actual π slope may be, *it* is not an intended indication of the sun-distance. The nine on ten ($\frac{9}{10}$) slope is the closest possible approximation to the actual one which may be written in the fundamental numerals, and yields an astonishingly accurate (91,836,011. miles) value for the mean solar radius. The several arguments in favor of the height of the Pyramid being intended as a factor of the mathematical function of this solar radius remain in force whether the true slope be $\frac{9}{10}$ or something else.

Now, if the monument be actually built, as it undoubtedly is, in π proportions—*i. e.*, if it be so to speak, a π -*Ka-metron*—then the absolute slope along the arris lines is $\frac{4}{\pi\sqrt{2}}$. It is a noticeable fact that "Ahmes in his mathematical papyrus defines pyramids by their sloping height up the arris edge, and their diagonal of the base beneath that line." And this ancient and well informed authority lends credence to the form of function adopted by the elder Petrie in his pyramidal expression $H \cdot (10)^9$ for this required distance.

Let us examine this matter a little closer, and, to do so, designate the height by H, the base by B and the diagonal by D, a π -pyramid now being under consideration. Taking now the usual British inch formulas we have

$$B = \frac{180^2}{2\sqrt{\pi}} = \frac{16200}{\sqrt{\pi}}$$

$$H = \frac{180 A}{\sqrt{\pi}} = \frac{32400}{\pi\sqrt{\pi}}$$

$$D = B\sqrt{2} = \frac{16200\sqrt{2}}{\sqrt{\pi}}$$

$$\frac{1}{2} D = \frac{8100\sqrt{2}}{\sqrt{\pi}}$$

Hence the ratio of H to $\frac{1}{2}$ D, or the slope up the arris line, is therefore accurately

$$\frac{H}{\frac{1}{2} D} = \frac{\frac{32400}{\pi \sqrt{\pi}}}{\frac{8100 \sqrt{2}}{\sqrt{\pi}}} = \frac{4}{\pi \sqrt{2}} = \frac{2 \sqrt{2}}{\pi} = .900316315 + \text{ on } 1$$

$$\text{or} = 9.00316315 + \text{ on } 10$$

Hence Mr. Petrie's formula for the sun-distance becomes

$$S = \frac{32400}{\pi \sqrt{\pi}} (10)^{9.00316315 +}$$

$$= (5818.622870 +) (10)^{9.00316315 +}$$

But from the principle of logarithmic powers and roots the

$$\text{Log. of } (10)^{9.00316315 +} = \text{logarithm of } 10 \times 9.00316315 +$$

$$= 1. \times 9.00316315 +$$

$$= 9.00316315 +$$

and therefore the number corresponding to the logarithm 9.00316315 + is the factor by which, if we multiply 5818.622870 +, we shall get the Pyramid sun distance!

Now, the foregoing considerations strike me as remarkable in several ways. In the first place we have obtained an absolute form for the Pyramid sun distance, to wit:

$$S = \frac{32400}{\pi \sqrt{\pi}} (10)^{\frac{20 \sqrt{2}}{\pi}}$$

In the second place we find that the only practicable way of solving the equation, or rather of reducing the function is by *logarithms*, and hence are justified in assuming *that the architect also understood their nature thoroughly*, for the very formula we have obtained demands, as its only determinable solution, that 5818.62'', etc., shall be multiplied by the number whose logarithm is 9.00316315 +!

Again, I want to call your attention to the several dimensions indicated upon the eastern base of the Pyramid. The fundamental base line is undoubtedly indicated by the S. E. socket level, and seems unquestionably to be 9139.871254 + = $\frac{16200}{\sqrt{\pi}}$ in terms of the British inch, with which unit it may have been foreseen the measurements were eventually to be made. Now Petrie's measured eastern socket line (*i. e.*, from S. E. to

N. E.) seems also to indicate the distance 9131.05 in British inches. The former of these lines is horizontal, as are all the courses of the Pyramid; the latter or socket line is inclined. This latter, therefore, cannot be intended for recording anything but a *ratio*. Actually it is the year number (365.242+) multiplied by the cubit number (25.) And hence if we take the horizontal distance 9139.87125+ and divide it by 365.242+ we shall obtain the true earth-commensuric length of cubit in terms of British inches 25.024+ and the ratio of 25:25.024+ calculated out so far as we are *sure* of the year number, or *vice versa*, will give us the true increment to 25 British inches, by means of which we have the “*sacred cubit*” undoubtedly registered in the fundamental horizontal line (distance due north from S. E. socket, to its intersection with the N. E. diagonal at same level).

It is a pointed fact that the E. socket line 9131.05= (365.242+) × (25), no more and no less. It is also pointed that 25. *British* inches is *not* a clean function of the polar axis.

It is, however, equally apparent that $\frac{9139.87125+}{365.242+} = 25.0241+$ is a clean value, to wit: 1-10000000 of the polar axis, and as this distance, and not the socket line—which *slopes*—is intended for absolute measure, I cannot but feel that our British measuring unit has been only foreseen as a means towards the real end in view. I have seen no argument yet advanced which goes to establish the British inch as commensuric with the *Polar axis* in grand round numbers. Now, it is clearly the *Earth*, and not the Pyramid alone, that we are after, and I must reiterate, what I have often, with Mr. Clark, called attention to before, that the simple determination of a series of formulæ which, depending upon the 360° division of the circle (undoubtedly a *false* and Babylonish method), and coming out in British inches, does not and cannot establish earth-commensurability. If these things are so, and if we obtain a complete set of formulæ, running all through the Pyramid, in terms of the 360° circle and the British inch, then every dimension so resulting must be reduced to the earth-commensuric inch indicated so clearly in the fundamental base, or “*we are left.*” I really think it would

be well to read again the questions I propounded in the letter published July, 1883. Question 7 is the pointed one in this connection. If the answer to it is in favor of the British inch, which yields for the socket line $365.242 \times 25 = 9131.05 +$, then the reply to it is: This inch is not earth-commensuric—its relation to the polar axis is not 1-500,000,000th, but is an irregular number, and the architect failed to grasp the terrestrial dimensions *accurately*.

Now I believe he *did* grasp them accurately; but that he did so in the geometric cubit $25.024 \pm$ British inches. I have not seen a single reply to the objections against the 360° division of the circle. Has the Cleveland branch of the Institute anything to advance in its favor as a *correct* geometrical and numerical subdivision? If so I, for one, would like to hear the arguments.

Briefly, my present position is this: I believe that most all of these beautiful British inch formulæ are correct. But I believe also that each one of them must be reduced by the ratio of the earth-commensuric inch to the British inch, in order to pass to and obtain *Earth* facts. I feel that a part of the wisdom of the architect, or else of the inspiration that guided him, was to arrange this monument so that when the time came for it to be measured it should be read *noticeably* in terms of the unit used, but point as noticeably towards the *real one intended*. Now this idea is in keeping with the past history of the monument itself. For I am beginning to believe that when this same mysterious monument was erected by Egyptians under Hyksos direction, its dimensions were laid out in still another measure. I do not believe that it was laid down in either British cubits of 25" or sacred cubits of $25.''024 +$ but in $20.''636 +$ cubits of Egyptian daily use. Everything seems to point me to this conclusion, to wit, that it was built in one measure, intended to be measured in another, and at length irresistibly designed to expose the *real truth* is still a third—the earth-commensuric cubit!

Take these ideas for what they are worth. They are founded upon pretty good premises, and truth will at length prevail; and view this matter as we will, we may be certain that who-

ever built the Pyramid has wrought far more wisely than he knew.

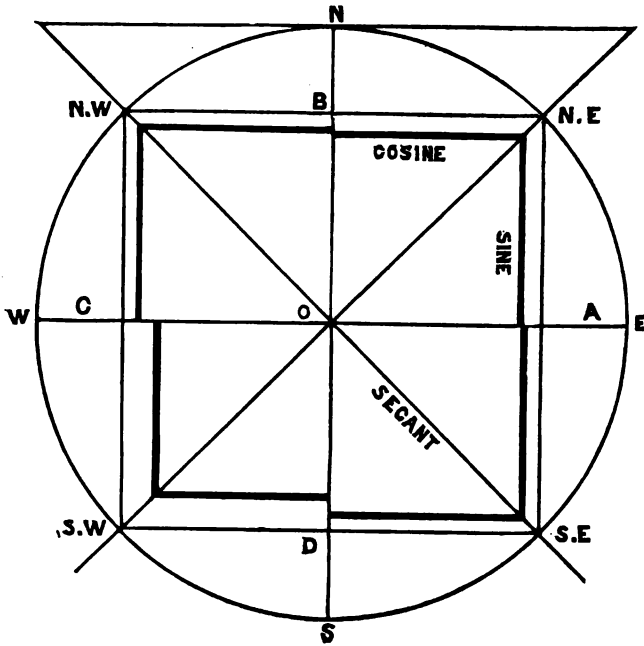
Yours, sincerely in the search of truth, and willing to accept it when it is proved, though it overturns all my ideas.

C. A. L. TOTTEN.

THE STRUCTURE OF THE BASE.

As a still further proof that the architect plotted the general plan and structure, and laid it out on the solid rock as a sort of trial plot of the triangulation and work to be done and embodying all the leading features of the future edifice, and as a guide to the builders, we may point to the well-known "trial passages" found on the east side of the Great Pyramid. They form a model of the Pyramid's passages, shortened in length, but of full size in width and height. They are, in fact, exact copies, and are simply "trial passages," to be used by the builders as models of the descending, ascending, and grand gallery passages.

Our object in this article is to supplement what has already been published in our last article to the effect that the general working plan plotted on the spot was a trigonometrical arrangement of sines, cosines and tangents, such as is usually found in our common text books on trigonometry in relation to surveying and trial plotting a triangulation. We illustrated our statement with the following diagram :



The rock cuttings in front of the Pyramid, on the east side, were in like manner plotted from accurate offsets, as may be seen by reference to Petrie's Plate III. There is good reason for supposing that the east side of the Pyramid was laid out in front of the base. The axis of the north trench is about 1086 inches on the ground from the east base of the Pyramid, and this is about the height of the grand gallery entrance on the sloping face. The axis of the south trench is about 1126 inches from base, and agrees with the height of the queen's horizontal passage. Whilst the outer edge of the great basalt pavement is about 2150 inches from the base, and agrees with the height of the king's room on the sloping face of the Pyramid.

The axis of the north and south trenches may represent a tangent to a circle equal to the core base of the Pyramid, in general terms. But, as we see from the diagram, the core lines are not identical on the east side, nor in the alignment. Therefore, the tangents to the core base cannot be the same. Ac-

cordingly, we find the north and south trenches have not the same axis. The south trench is a tangent to a circle nearer the finished base of the casing = 115 inches from the finished base, whilst the north trench is tangent to a circle more distant from the finished base = 165 inches. The difference in these tangents will be the difference in the thickness of the casing. And this agrees well with the results, as found by actual measurement. The casing averages, according to Petrie (pp. 43, 185), 108 thick at the base and about 33.7 at the corners.

This remarkable fact was noticed by Petrie in his recent work. He says: "The inner ends of the trenches are said to be points lying on the circle equal to the finished base of the Pyramid. The inner end of the north trench is nearest to the circle, being 5,782 from the Pyramid centre; the Pyramid height being 5776 ± 6 , or the radius of the base circuit 5,773.4. A line drawn through this point (inner end of N. trench, or N. tangent), to the centre of Pyramid, is at $103^\circ 48' 27''$ to the face of the Pyramid, and is said to be parallel to the axis of the E. N. E. trench, which is at $103^\circ 57' 34''$ —a difference equal to 15 inches in the position of the trench end." This angle is complement to the angle of the vertex of the Pyramid, and would seem to stand related to this spot, for the angle of the vertex is $76^\circ 17' 31.4''$, and its complement would be $103^\circ 42' 28.6''$, or $51^\circ 51' 14.3'' \times 2 = 103^\circ 42' 28.6''$.

S. BESWICK.

Strathroy, Ontario.

THE MEASURE AND THE POWER.

THE IMPERIAL BRITISH INCH.

The Imperial British inch is the basis of the two-foot rule; together these are popularly known as the inch and the twenty-four inch gauge. This inch is older than all history and all tradition; indeed there is strong evidence that it took its origin when the Great Architect stretched his measuring line upon *the void*. Its function, with that of the denominations raised on it, is to co-ordinate measures of *space* with those of *time*, and in this last it involves the idea of

LIGHT.

In historic time this inch has had the peculiarity of becoming, in continuous sequence, the property or belonging of *the current leading nationality* of the world.

THE EGYPTIAN OR HEBREW CUBITS.

(a) Take the π ratio (John A. Parker) of 20612 : 6561.

Taken as inches, then 20612 divided by 1000 gives 20.612 inches, and this was one of *the royal Egyptian cubits*. This cubit value is found in various ways: (1) The French made a great many measures of the rooms, passage ways, etc., of the catacombs of Osymandia. Gustav Seyffarth found a papyrus scroll in which the cubit measures of these rooms were recorded. "By the microscopic tests of Bidone and Plana the Turin cubit (so named because in the Turin Museum), is .523524 of the *metre*" (See Part Seven, p. 151, of Seyffarth's Contributions to the Knowledge of the Literature, Art, Mythology, and History of the Ancient Egyptians). On comparison Prof. Seyffarth found that these French measures answered to the specifications of the scroll in terms of this cubit. (2) The *metre* being 39.37079 B. inches, then this *cubit* was 20.611553 inches long—by trial of Prof. Rogers it is slightly larger, making this cubit some 20.61172 inches long. Thus the restoration of this cubit in British inches, compares with the 20.612 inches of this Parker π ratio, as

20.61172, showing a difference of .00028 of an inch in this length, or of .000013 shortage in the length of the inch. (3) From independent sources Sir Isaac Newton recovered this cubit as 1.7117 B. feet, or 20.604 inches; and it was this recovery which caused such great value to be assigned to the year 1717 of the Christian era in Great Britain.

(b) But if we raise a true proportion on this π ratio, as follows: 20612 : 6561 :: 64800 : 20626.4, then dividing this proportion by 1000 we have 20.612 : 6.56 :: 64.8 : 20.6264, where, in the *fourth* term, we find we have recovered another of the *Egyptian royal cubits*, as 20.6264 British inches. The so-called Nilometer cubit was recovered by Mr. Wilkinson as 20.625 British inches.

Thus we have from the peculiar *geometrical* relations of this proportion *a reason for the origin* of these cubits in terms of British inches, clearly showing the correction to be made on the empirical recovery of their lengths. So, also, we have a plain showing as to their relation and interdependence on each other. It will also be observed that the N. cubit, as 206264 *seconds*, is *radius seconds* of the circle of 360 *degrees*.

Upon application of these cubit measures to the various dimensions reported of the rooms, passageways, etc., of the Great Pyramid, especially the N. cubit, it is found that they fit so accurately as to disclose the architectural intention of the designer (See the various articles in this Magazine, by Mr. Charles Latimer and Mr. Dow). So clearly and convincingly is this shown by these gentlemen, that it may be said to be demonstration, and beyond peradventure.

The use of the Turin cubit is especially to be found in the queen's chamber; that of the Nilometer cubit in the king's chamber. Mr. Flinders Petrie finds both of these cubits so closely, and so pointedly, that one would almost be led to suppose that he was well acquainted with the fact of their discovery, and their application in the Pyramid; a quite probable suggestion, as this discovery was made prior to 1875, and has been quite widely published and disseminated.

Thus we may affirm that the Imperial British inch belonged to the Ancient Egyptian nation, the leader of the present

world's civilization. But it is found that the Hebrews had these identically same measures, and made use of them as the foundation, or substratum, on which to found that religious structure contained in the Sacred Books. Especially is it to be found in these books that the *laws and ordinances* arose out of constructions in masonry. As to this see Jeremiah xliii., 10, 11; xliv., 5; xxxiii., 25; X., 2, 3; also Revelations xxi., 16. The Hebrew nation has been the banner-carrier in the upward and onward march of humanity. It has had the especial office of preserving *unalterably* the letter of the Word of the Law containing the use of these measures.

THE ROMAN FOOT.

But multiply this ratio of 20612:6561 by $\frac{4}{3}$, and this product again by $\frac{4}{3}$.

The first product, as to 20612, gives a basis for finding the exact period of *a sidereal lunation*, or 27 d., 7 h., 43', 3", 47''' 20''', "the *mean period* which the moon observes through all time."

The second product, as to 20612, gives a basis for finding the exact period of *the mean year*, or 365 d., 5 h., 48', 50'', 53''', 6'''. (See Parker's 'Quadrature,' first edition, pages 117 and 120).

The second product, as to 6561, however, is 11664. This, as inches divided by 1000 gives us 11.⁶⁶⁴ inches, and this was the Roman foot.*

Thus in continuous line of sequence we find the Roman nation in possession of this Imperial British inch as lying at the basis of her foot measure; and, indeed, she was the successor of the dominating power in the world. It is to be observed that the measure of her adoption is derived from the same π ratio with the Egyptians and the Hebrews.

In calling attention to this it is very interesting and instructive to connect this origin with the following ratio of 20612:6561 :: 64800:20626.⁴¹ already given. Raise this proportion by multiplying it twice by $\frac{4}{3}$. While all that has been said above will make its appearance we shall have a further extension, in the

* See recovery of this measure as 11.⁶⁶⁴ British inches by Prof. Greaves, as noticed in 'The Great Pyramid' by John Taylor, page 24, *et seq.*

fourth term, of a product of 36669.280031+ inches, or 3055.773 feet. The $\frac{1}{4}$ of this is 763.943 feet or 9167.320 inches, or, as per Howard Vyse, *the base side length*, between sockets of the Great Pyramid.

He gives this measure as 9168 inches. From the half of this base side length *deduct* its one-tenth, and there will remain 4125.294 inches, or the length of the descending passage way, which Col. Vyse gives as "about 4126 inches."

THE IMPERIAL BRITISH INCH AND THE DENOMINATIONS RAISED ON IT.

Succeeding the *Roman Nation* as the one, and only one, having a predominating power over the world's progress, is the *English speaking race*. And here, as belonging to Great Britain, we find not only this inch as the standard unit, but also a series of denominations of measures, as the *foot*, the *fathom*, the *yard* and the *mile*. Here seems to be the perfection of that system of measures made use of in primeval times to *interpret* the cubit construction of the Great Pyramid. For we find all these measures orderly placed in that work; and that so as to work out a series of co-ordinating *time measures*.

Whether there is Fate and Destiny, or better, a Divine Providential care in thus connecting this origin and system of measures with the world's successive controlling powers, is a matter open to the speculation of those who may be pleased to go further in the matter than the bare recital of the facts. The latter is the only purpose of this contribution.

J. R. SKINNER.

NOTE.—It may be noticed as to the Hebrews and the Egyptians that they seem to have been from a common Semitic stock. Either was in possession of these measures, without priority, both having them from a common race stock or root.

CORRELATION OF ANGLO-SAXON MEASURES.

It has been demonstrated beyond reasonable questioning that Egypt, the most learned, most religious and most ancient seat of civilization, had a metrology founded upon correct knowledge of geometry and astronomy. How that knowledge was obtained we perhaps cannot say. That it belonged to the Great Pyramid builder is most certain. That the metrology there used was substantially what we use to-day may, we think, be proved to a very high degree of probability, if not mathematically and physically demonstrated.

But it more immediately concerns us to know what actual relation our metrology bears to the natural standard of measure? What correlation exists between our system and the nature, form and movement of the earth? So far as Pyramid discoveries go to establish true relationship between nature and Anglo-Saxon metrology, they are of value to our present investigation. To indicate somewhat the scope of our inquiry we begin with the following proposition, using Anglo-Saxon measures throughout.

PROPOSITION I.

If the number of degrees in a circle be divided by the number of hours in a day, and the quotient be multiplied by the number of feet in a mile, the result would be, in miles, ten times the earth's diameter at the Great Pyramid, that is, $\frac{360}{24} \times 5280 = 79200$.

Proof.—The longest equatorial diameter is 41852.864 feet (Clarke) which is in E longitude $14^{\circ} 23'$. In the longitude of Paris, which is not so far east by $12^{\circ} 3'$, the equatorial diameter is 41852.695 feet. Hence the diameter at the equator decreases 14 feet for 1° of longitude. The Pyramid is nearly 17° from the longitude of the greatest equatorial diameter, therefore, the equatorial diameter at the longitude of the Pyramid is $41852.864 - 17 \times 14 = 41852.626$. The diameter of the earth at latitude 30° is .99917 of the diameter at the equator on the

same meridian. Hence the earth's diameter at the Pyramid is $418526.626 \times .99917 = 41817.888$ feet = 7920.04 miles. In this first proposition are correlated by integral numbers, circular measure, time measure, linear measure and the diameter of the earth at the Pyramid.

PROPOSITION II.

The correlation of circular measure, time measure, linear measure and the latitude of the Pyramid is evidenced in the base lines of the Pyramid.

Proof.—One minute (1') of longitude at the latitude of the Pyramid is 5280 feet.† This gives a parallel of latitude = 114048000 feet. The $\frac{1}{1000}$ part of the diameter of this circle is 36302.604 feet. The one-fourth part of the latter is equal to 9075.651 feet; laid out on the scale of 1 inch to a foot it is 9075.651 inches, that is $\frac{5280 \times 21600}{4 \times \pi \times 1000} =$ base side on pavement = 9075.651 inches, or 440 cubits (20.62648). Mr. Petrie's computations from casing stones found on the pavement near the middle of each side, without any allowance for wear or form or finish is 9069.4 and 9069.5 for the N. and S. sides respectively. Forty inches lower than the level of the pavement is the level of the lowest (S. E.) corner socket. The N. E. corner socket is 11.4 higher than the S. E. and 9131 inches distant from it. It is conceded that the sockets are in the slope of the corners. It is also conceded that the angle of slope of the face sides is $51^\circ 51' 14''$ nearly. At this angle of slope the N. face carried down to the level of the S. E. socket will give a *geometric* base side of $9131 + 8.8 + = 9139.8 +$. The difference between this geometric base side and the pavement base side is $9139.8 - 9075.6 = 64.2$. One-half of this or 32.1 will be the horizontal distance inwardly that the face would extend in rising up from the geometric or S. E. socket level to the pavement base, and $32.1 \div .7854$ will give the difference between the levels of the two bases. It is 40.8 inches. Mr. Petrie, from actual survey computed the S. E. socket at 40. inches be-

† Prof. Stockwell computes it at 5277.7. Other computations make it a little more. It is certain that the 1' mile longitude is within convenient sighting distance of the Pyramid. for a survey.

low the pavement. The difference of .8 between his survey and our correlation may arise from a slight change of levels in the past 4000 years. The displacements found in the interior certainly indicate that such a change is not only possible but probable.

The correlation goes beyond this. Heretofore we have demonstrated that the geometrical, not the pavement base side, is one ten-millionth of the best obtained computation of the earth's polar radius, multiplied by the number of days in the tropical year. We now proceed to a minute examination of the orientation of the Pyramid in terms of Anglo-Saxon metrology. It will be observed that by no other system of metrology is such a correlation possible.

Mr. Petrie's agrees with other surveys of the orientation of the Pyramid. It stands about 4' west of north. The azimuth of the S. E. to N. W. diagonal, computed by Mr. Petrie from the outer corners of the socket, is $45^{\circ} 4' 13'' \pm 6''$. There is no more accurately defined line in the entire structure. A square with this line for its diagonal, would have an azimuth $4' 13'' \pm 6''$ W. of N. What does this azimuth signify, and how was it obtained? In a most valuable memoir on the secular variations of the eight principal planets, prepared by Prof. John N. Stockwell, and issued by the Smithsonian Institute in 1872, a table of precession of the equinoxes is computed for a period of 16000 years. Forty centuries ago the annual precession was $49.406''$. In five years it amounted to $4' 7''$, a very considerable angle and subject to accurate measurement. Neither four nor six year's precession will approximate $4' 7''$. Nor will five years' precession give this azimuth, outside of the 22d century B. C. The inference, therefore, that the azimuth of the N.W.-S.E. diagonal was the result of actual observations for a period of five years, to obtain the precession of the equinoxes, appears to be reasonable. Certainly the azimuth agrees with the astronomical fact, and if it was designed to read the precession, it reads the date of the Pyramid. The annual precession of the equinox 2170 B. C. $\times 5$ = azimuth of Pyramid.

Mr. Petrie tells us that there was an uncertainty in his determination of the socket sides averaging .65 inch on each side.

We may fairly infer on account of weather wear or abraiture of the sockets that this possible error of 6'' should be deducted from his measures rather than added to them. In that case his 4', 13'', \pm 6'' would become 4', 7''.

This appears to be reasonable evidence that the N. W.-S. E. diagonal, by its azimuth, records the equinoctial precession. Is the precessional period as computed from the observations of the 22d century B. C., also recorded? This period Prof. Stockwell computes at an average of 25694.8 years, with a variation less or greater by 2812 years. Four thousand years ago the tropical year was 248 seconds longer than its mean period—that is, its actual length in the 20th century B. C., in mean solar days, was 365.242549. One-fourth of 100 such days is 9131.0637.

(3)
$$\frac{\text{The tropical year 2170 B. C.} \times 100}{4} = \text{east socket base side (inches).}$$

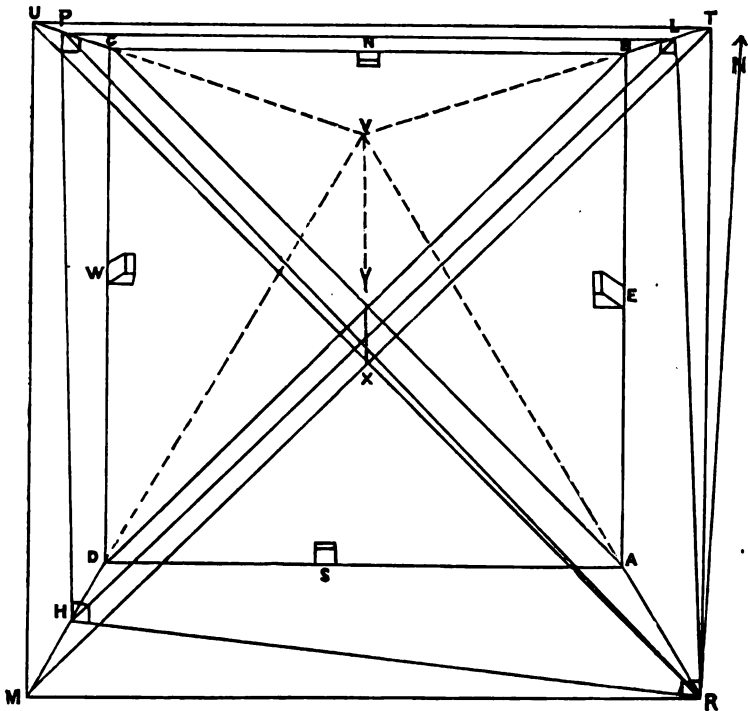
From Prof. Stockwell's table of the variations in the eccentricity of the earth's orbit we find that the eccentricity 2170 B. C. was .0182274. Multiply this by $\frac{1}{1000}$ of the earth's polar axis and we have 9122.8 +.

(4)
$$\frac{\text{Eccentricity of earth's orbit 2170 B. C.} \times \text{polar axis}}{1000} =$$

north socket side (inches). Take now a square having a side = to 9139.8 + inches, and with one corner resting in the S. E. socket let its diagonal pass through the corner of the N. W. socket. On this diagonal as a base, and with formula (4) for the north side and formula (3) for the east side, construct a triangle with its apex in the N. E.-S. W. diagonal and the N. E. vertex of the triangle will rest on the N. E.-S. W. diagonal. By this construction we can obtain the value of the base of the triangle. It is 12914.136. This same line obtained from Mr. Petrie's survey is 12914.292. The difference between the surveyed line and the line resulting from our correlation is $\frac{1}{8}$ of an inch in nearly 13000 inches. The double of this line is 25828.272, or 134 in excess of Prof. Stockwell's computation for the mean precessional period—that is, it is nearly half way between the mean value of that period and its greater extreme.

We do not doubt that the ancients had some accurate methods

of astronomical observation and computation. And we suggest that the trenches and basalt pavement on the east side of the Pyramid were constructed in order to make such observations from which to build the monument and also to lay it out by their own methods of civil engineering.



In all this there may have been no need of extraordinary or supernatural revelation. Men could take the measure of the earth and observe the passage of stars then as well as, or, perhaps, better than, now; and if they recorded any astronomical facts or events in the structural form and proportions of the Pyramid they did not accidentally, or for mere building convenience, make the levels of the corners differ from 7 to 17 or 20 inches. We submit that some of the old civilizations may yet prove sound instructors to the new. It is much as Dr. Mait-

land said of the middle ages, we call them the Dark Ages because we are very much in the dark about them.

In conclusion we wish to note how mathematically beautiful is the correlation of a portion of Anglo-Saxon metrology. Take first the length of a pendulum beating seconds at the Pyramid, it is 39.0625 inches, or $5^8 \div 10000$. Next take 10000 cubits (20.6264), it is the radius of a circle in which 1" of arc equals 1 inch, and 15 inches equal 1 second of time. Once more take the mile, 5280 feet of linear measure, it is 3072 cubits (20.625), therefore the radius of a circle having a circumference equal to 1 mile to 1' is 880000 cubits (20.625), and 880 cubits is the radius of a circle having a circumference of 114048 inches or 9504 feet. Thus the cubit bears to circular and linear measure the like relation that the modern π bears, for it is derived directly from the circle in which 1" of arc = 1 inch, the circumference being 1296000, $\frac{1}{10000}$ of the radius is 20.626 +. The small difference of .001 + between the two cubits of 20.6264 and 20.625 being necessary for a convenient and practical correlation of the linear mile with circular and time metrology.

H. G. WOOD.

FLINDERS PETRIE'S WORK AT THE GREAT PYRAMID.

(1) He professes to have obtained the distance between sockets and the base line of the Pyramid proper by triangulation.

From this:

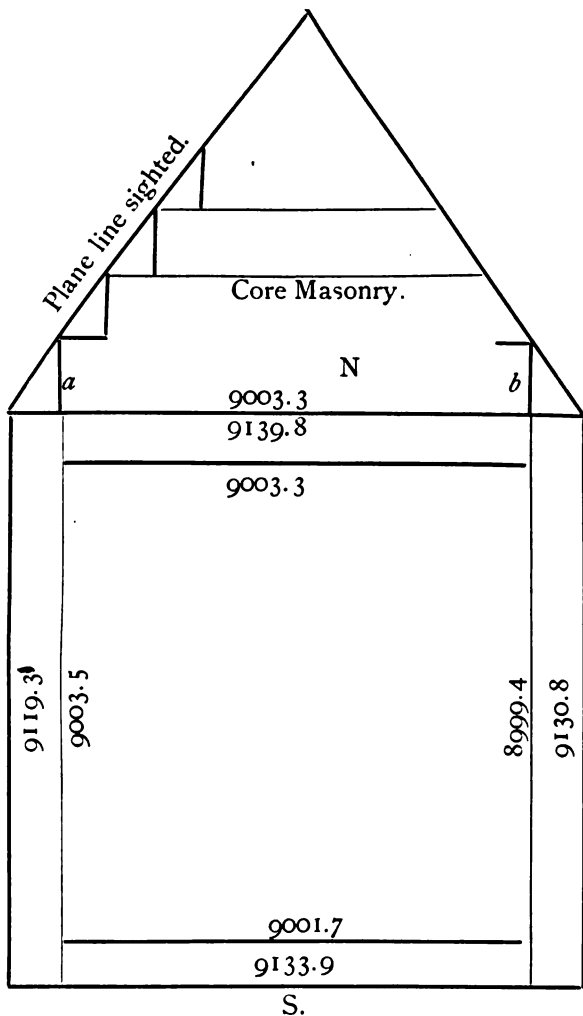
“Therefore, when reducing my observations, after the first winter, I found that the casing on the north side (the only site then known) lay about 30 inches inside the line joining the sockets, I searched again and again for any flaw in the calculation. But there were check measures, beside the regular triangulation, which agreed in the same story; another clue, however, explained it, as we shall see” (p. 37).

This clue professes to be as follows:

“The form of the present rough core masonry of the Pyramid is capable of being very closely estimated. By looking across a face of the Pyramid, either up on edge, across the middle of the face, or even along near the base, the mean optical plane which would touch the most prominent points of all the stones, may be found with an average variation at different times of only 1.0 inch. I therefore carefully fixed, by nine observations at each corner of each face, where the mean plane of each face would fall on the socket floors. On reducing these observations to give the mean form of the core planes at the pavement level, it came out thus:

Case plane sides,	N.	9003.3	inches.
	E.	8999.4	“
	S.	9001.7	“
	W.	9003.5	“
		<hr/>	
Mean,		9001.5	“
Socket Sides,	N.	9139.8	“
	E.	9130.8	“
	S.	9133.9	“
	W.	9119.3	“
		<hr/>	
Mean,		9125.9	“

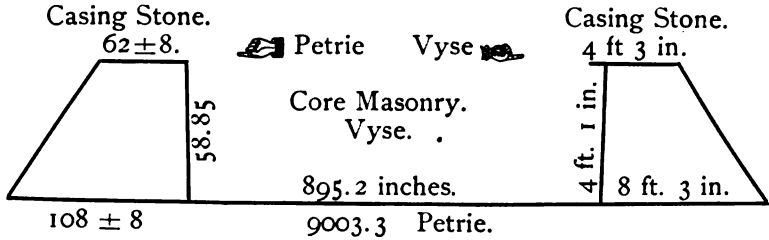
A section showing this for N. side is here given.



Mr. Petrie plainly says this is the result on the measure of the Core Masonry.

Davidson, the French and Colonel Vyse make the line $a b$ to be 746 feet = 8952. inches As above 9003.3 inches; difference 51.3 inches.

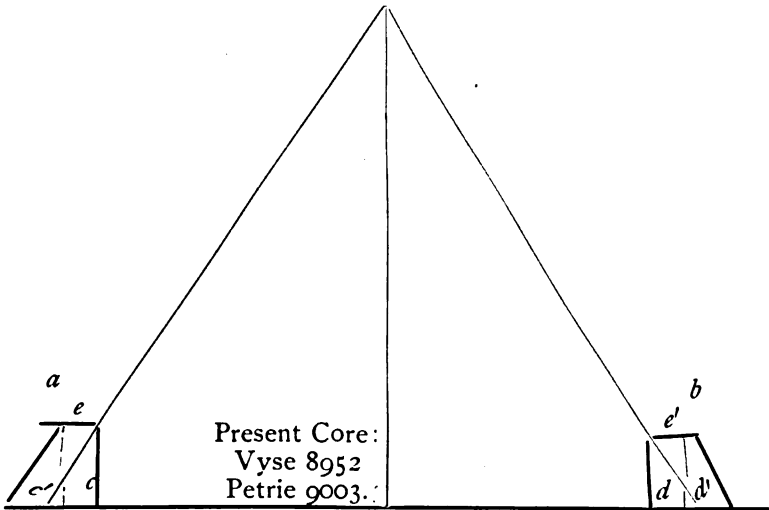
The following shows the relation of the casing stones to the core masonry by Petrie and by Vyse :



By this the base side by Vyse would be $8952 + 198 = 9150$ inches. By Petrie, $9003.3 + 200 = 9203.3$ inches.

But as Petrie makes the entrance length of sides restored by casing stone to be 9139.8 , it is evident he has made an error of statement with regard to the core masonry or 9003.3 . That is, it cannot be the present core masonry, because he says expressly that the casing stones have a thickness of 108 ± 8 , or say 100 inches each, to conform to Vyse.

To show how he made this error :



a and *b* are the casing stones to be replaced on the core masonry to complete the base side.

Now Petrie by his sight line takes the measure *c only*, whereas the true addition is *c* or *c'* *plus* the thickness of the flat top *e* or *e'*, and this is 51 inches by Vyse, and 62 — 8 by Petrie, or say 54 inches. Petrie was following Vyse, as most of his measures show.

Take Vyse's measure of the present core masonry or 8952 inches. Add the top thickness of the casing stone or 51 inches to complete the extension of the core masonry, and we have $8952 + 51 = 9003$, or Petrie's measure of the core masonry. Petrie undoubtedly took this process, which prepared him for his sight line, to obtain the addition of the extra thickness of the casing stone as *c* or *c'*. But his error was in omitting to add the length of the top thickness of the casing stone *once again*, for the opposite side of the Pyramid. And this would give for the core *masonry restored*

$$8952 + 51 = 9003.0 + 51 = 9054 \text{ in.},$$

to which he should then add as resulting from the sight lines, the extra distances *c* or *c'* and *d* or *d'* or together some $49 \times 2 = 98$ inches, making $9054 \times 98 = 9152$ inches.

It is easy to see how his error took place, but it is almost incredible how he came to make it, for the consequences are disastrous to his ideas as to the descending passage way.

For on the corrected extension the nineteenth course of masonry would be so far extended out horizontally that to have the descending passage way terminate in it at the proper intersection he would not only have to extend its length far beyond a limit of credibility but, moreover, because of his fixing the height of the existing basement sheet at some 611.2 inches above the level of the pavement, the intersection of the descending passage way with masonry course 19 would take place far within the outer surface of the sloping side of the restored Pyramid.

Vyse gives core side as 8952 inches—thickness of casing stone or bottom 99 inches; but distance measured between sockets on N. base side 764 feet, or 9168 inches, making for the casing thickness $9168 - 8952 = 2\frac{1}{2}^{\text{ft}} = 108$ inches each, in place of 99 as he gives it—and this shows that Petrie was following him as he gives the thickness of the casing stone as 108 inches.

It is possible there was a backing course between the casing stone and the masonry core, of some 9 inches, which would account for this feature.

In some respects Mr. Petrie has done some good work, verifying and comparing the measures of those preceding him.

N. B.—Take it that Mr. Petrie's 9003 was derived from Vyse's 8952, to which the casing stones were to be added by his and Petrie's measures.

$8952 + 62 + 62 = 9076 + 46 + 46 = 9168$, or just Vyse's measure.

Here again he adopted Vyse's measure of top of casing as 4 feet 3 inches, or 51 inches, which added to 8951 = 9003. whereas he found the casing stone to be on top 62 inches and on bottom to be 108 inches; and with this correction his restored masonry course should have been $8952 + 62 = 9014$ (in place of 9003), and 62 to this would make for restored masonry course $9014 + 62 = 9076$ inches, and then his sight line plane would give him $46 \times 2 = 92$ to be added, making $9076 + 92 = 9168$ inches.

Now Petrie works out his core masonry again in which he makes that of N. side = 9012 in place of 9003, which shows that he was making this very correction.

But see "Plate X" work for N. side :

Total length of base side, 9129.8
Deduct $22.4 + 25.7 = 48.1$, 48.1

9081.7

Deduct $39.4 + 27.7 = 67.1$, 67.1

9014.6 inches!!!

Which proves what is said as to 9014 inches on last page!!!

Thus in fact Petrie is confirming the measures of Howard Vyse, viz: 9168 inches.

April 8, 1884.

J. R. SKINNER.

DOW'S NEW FORMULA, (P. 240).

Mr. Dow's new formula for the height of the wall in the king's room is neat and beautiful, and as simple as it is beautiful. But it is not altogether new, for Petrie has referred to it and used the formula itself, and got a very near approximation as the result. Mr. Dow's formula is $648 - \frac{1296}{\pi} = 235.470388$.

And the circle has 206.2648 for radius, and $\frac{1296}{\pi} = 412.529612$ for diameter. Petrie, referring to the formula for obtaining the height of the king's room, says: "The only other theory of the height of the walls is similar to one of the best theories of the outside of the Pyramid; it asserts that, taking the circuit of the N. or S. wall, that will be equal to the circumference of a circle whose *radius is the breadth of the chamber*, or whose diameter is the length of those walls. Now, by the mean original dimensions of the chamber, the side walls are 412.25 long, and the ends 206.13, exactly half the amount. Taking, then, either of these as the basis of a diameter or *radius of a circle*, the *wall height*, if the sides are the circumference of such circle, will be $235.32 \pm .10$. This theory leaves nothing to be desired, therefore, on the score of accuracy."

The formula is the same in *principle* as Mr. Dow gives on p. 240, and embodied in the diagram, but the numbers used are slightly different. If Petrie had used Mr. Dow's number—206.2648—instead of 206.13, he would have got out the same height as Mr. Dow—235.470388 instead of $235.32 \pm .10$. The principle of the formula is really not new, for Petrie speaks of it "as one of the best theories" (p. 190) then known. But Mr. Dow has made it new by bringing it into the group as an outgrowth of the analytical unit, and thereby fixed the true value of the factors used in the calculation.

Perhaps I might suggest an addition to this analytical group, which will bring out the analytical value of the diagonal to the perimeter of the Pyramid's base.

If the solid diagonal of the king's room be $\frac{1620}{\pi} = 515.662016$

And the height of Pyramid be $\frac{32400}{\pi \sqrt{\pi}} = 5818.622870$

And the side of Base be $\frac{16200}{\sqrt{\pi}} = 9139.871258$

Then the following will also be true:

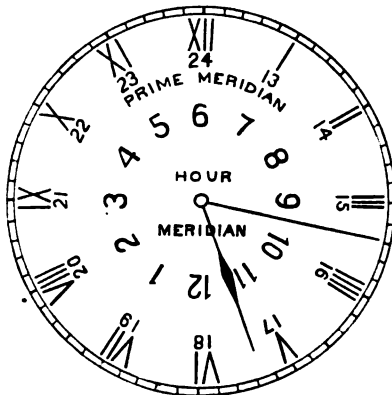
Diagonal of perimeter $\sqrt{\frac{16200^2}{\pi}} \times 2 = 12925.7312$

SAMUEL BESWICK.

Strathroy, Ontario, Canada.

PRIME MERIDIAN TIME.

The following simple device is an easy and ready way to adjust hour-meridian or "standard time" to prime-meridian time. No change of the machinery of our time-pieces is required by this method, and no additional hand is necessary. Let the hour numbers 1, 2, 3, &c., to 12 be put on the crystal inside, as shown in the cut.



The crystal being moveable, it becomes an adjustable dial which may be set 1, 2, or 3, &c., hours fast or slow of the fixed or common dial. Next let the fixed or common dial be used

for prime-meridian time. Adjust the crystal dial according to the number of hours you are from the prime-meridian, and it will show the local "standard time." Suppose Greenwich time be adopted for prime-meridian. Set the hands to Greenwich time. Now if we are using the 90th meridian, "standard time," it being six hours slow of Greenwich time, set the crystal dial with fig. (12) to correspond with (VI) of the fixed dial. It is so adjusted in the cut, which shows that when it is V o'clock and 17 minutes by Greenwich time it is 11 (eleven) o'clock and 17 minutes by "standard time" at the 90th meridian. A traveler carrying a watch thus provided with the hours marked on the crystal could change from New Orleans the 90th meridian, to Philadelphia, the 75th meridian, by turning the crystal (12) back from VI to V without disturbing the hands.

By this arrangement all the railroads of the country could run on one standard meridian, and their schedules would agree with the hours marked i, iii, iii, iii, v, &c., of the fixed dial, while the local time for any hour meridian would agree with the hours marked 1, 2, 3, &c., on the crystal dial. It is desirable that the dial for railroad use be immovable, on account of safety. Therefore the fixed dial is here used for prime-meridian time. Another advantage of this arrangement is that the minutes are read as we commonly read them from XII, the uppermost point of the dial, around to the right. The hours on the fixed dial can be continued, as shown in the cut, to 24 o'clock, while on the crystal dial they are, as now in use, from 1 to 12. Persons using watches thus arranged would, in case of the adoption of one meridian for railroad schedule time, look to the outside hours for railroad time, and to the inside hours for local time.

H. G. WOOD.

PROF. BARNARD'S BOOK.

The object of Prof. Barnard's book is evidently to bring discredit upon the Great Pyramid, and ridicule upon those who, having some respect for their Bible and the prophecies, believe that this Pyramid is "the altar and pillar of witness to the Lord of Hosts" referred to by the Prophet Isaiah; but which he, the "very reverend President Barnard," as you style him, with sublime indifference to the sacred writings and to the feelings of thousands of earnest, intelligent Christians, designates as a "stupendous monument of folly," a "huge and senseless pile." But if it is nothing more than this why should a person in his position waste his valuable time and talents in writing an elaborate book about it? Evidently because he finds that the great bulk of the Anglo-Saxon races cannot be induced to commit the folly of giving up their ancient, convenient and useful system of weights and measures for the cumbrous and pretentious French metrical system while this "huge and senseless pile" stands in the way. This metrical system may serve the purposes of a few scientific men, but it is wholly unsuitable for the general everyday requirements of the great majority of the people whose conveniences ought not to be sacrificed to the fancies of a few scientific men, however eminent as scientific men they may be.

Prof. Barnard complains of the action of the opponents of the metrical system as "a crusade against the spirit of progress of the age;" but will he venture to deny that the nations which still use the weights and measures which he condemns have made far greater progress in religion, politics, commerce, art, science and wealth, than all the nations which have for so many years been using the belauded metric system? The violence of his attack upon the poor Pyramid, and the bitter and contemptuous language he uses in speaking of those whose opinions differ from his own, betray a consciousness that the effect of his great efforts will, after all, only "about equal that pro-

duced by the honest old lady who attempted to sweep back the rising tide of the Atlantic with a broom."

As the very able paper by the Rev. H. G. Wood, in the January number of the STANDARD, has already taken most of the ground from under the Professor's feet, I will at present only refer to what he has said about the sun's distance. The Pyramid sun distance he describes as "a fact which, to plain human reason and simple common sense, is so grotesquely improbable that its possibility can only be defended by clothing it with the character of miracle;" he then gives the several astronomical determinations which have been arrived at since 1862—thus:

Leverrier	91,357,000	miles.
Chambers	91,465,000	"
Newcomb	{ 92,200,000 to	"
	{ 92,700,000	"
Young	92,885,000	"
Michelson	92,876,000	"

He then states that "the distance of the sun, as worked out on the Pyramid theory, is 91,837,000 miles," and concludes by remarking that "the Pyramid distance is, therefore, only about a million of miles too short; while probably the uncertainty which still attaches to scientific deductions is not so great as half a million." How he could venture to make such a statement in the face of the figures he quotes I cannot understand, seeing that the extreme astronomical values differ no less than 1,528,000 miles, while the difference between the Pyramid distance and the mean of all the astronomical distances is only 410,000 miles. Surely he must have formed a very low estimate of the intelligence of his readers if he expects that they will be influenced by such reasoning and statements as he has here employed. To show further how little his statements and opinions are to be relied upon, I may remark that since his book was published the first result of the last transit of Venus has been published by the eminent director of the Brussels Royal Observatory, M. Houzeau, and it gives the sun's distance = 91,756,800 miles, or 80,200 miles *less* than the Pyramid distance, which Prof. Barnard says is "only about a million of miles too short!" Pyramidists, therefore, need not feel discouraged

or fear that Prof. Barnard's violent but ill-directed attacks will endanger the Pyramid sun distance, or the British inch, yard, and mile.

May I be allowed to ask Prof. Barnard whether the great conveniences for the everyday business of trade and commerce, of the British system of weights and measures over all other systems in use, may not have had something to do with the making of the Anglo-Saxon races by far the richest in the world, and enabling Great Britain to lend money to many nations, and borrow from none? Certainly it has been no check or hindrance to a progress which is a marvel to the whole world.

With respect to the question of a prime meridian, I shall prefer Greenwich, simply because it is far more generally referred to at the present time than any other, and that the great bulk of the world's traffic is carried on in vessels which use it as their zero of longitude.

JOS. BAXENDELL.

EXTRACT FROM A PAPER BY JACOB M. CLARK.

READ AT A MEETING OF THE NEW YORK AND NEW JERSEY AUXILIARY SOCIETY, AT COOPER UNION, NEW YORK, WEDNESDAY, JULY 9TH, 1884.

The early germination of geometrical ideas, in the advance of mankind from savagery towards refinement, is well illustrated by the gorgets and other ornamental relics of certain tribes of western Indians, recovered in part from the ancient mounds, and figured in the second Annual of the Bureau of Ethnology, reported by Prof. Powell. They suggest themselves as having formed parts of the regalia of priests or initiated men; and exhibit in various combinations of detail, but with considerable persistence of typical expression, the cross in the circle, the square, the division of the circle by three, six, eight, twelve, etc., combined with signs which suggest circular motion and the flight and division of time. Many of them must be calendars; but, any way, they connect typically with Aztec and Egyptian monuments. If these things do not establish ethno-

logical affinity of these tribes with the Mound Builders, the Toltecs, the Peruvians, or with the pre-historic civilized peoples of the Eastern world, they at least indicate the germ of geometrical and astronomical conceptions, and go a long way towards verifying the doctrine maintained by Alexander Von Humboldt, the *identity of the human mind*.

And it is a most gratifying circumstance that we can now note everywhere a marked and growing tendency among writers on metrics—nowhere more apparent than among the members of our own Society—to insist upon *unity* and *simplicity* of conception throughout. And freely as we may concede that the French system was an outcome of this very tendency, yet it fell far short of the ancient systems, both as to its approach towards perfection in circular division, and in actual convenience. Take for instance the Persian system. The parasang was $\frac{1}{80000}$ part of the terrestrial circumference; and the $\frac{1}{10000}$ of this, about $26\frac{7}{100}$ inches, is now represented by the pic of the Turkish dependencies, and survives to this day in Persia. Compare this, as to convenience of length, with the French metre. Similar comparisons, with the same effect, might be made as to several other very ancient systems.

Our present nomenclature for the expression of mechanical energy or its effect—by such terms as horse-power, foot-pound, and, in French, kilogramme-metre, etc.—is exceedingly defective, and requires immediate and thorough revision. The terms are not based on a simple and obvious correlation between the units of ordinary measurement and the modes and conditions under which applied force produces its effects, and therefore of themselves convey no very clear idea to the popular mind. Their application in practice—nay, their intelligent apprehension even—requires previous special study, and, to some extent, the training of an engineer.

And it is passing strange that the agency we call *electricity*, whose recent past development surpasses the wildest dreams, and which promises possibilities for useful effect in the near future of which the most visionary can form but a feeble conception, should have been saddled as to its practical use with a new nomenclature and technology throughout, totally

disconnected from all other systems and from all its obvious correlations, and with purely arbitrary names, to serve as monuments of wind to some distinguished men. And it seems to us little short of infatuation that the British Association should have adopted such a manner of expression, based on the one hand upon the French system of metrics, and upon the current mode of reckoning time on the other! To one who has not made the subject a special study, the whole is unintelligible, in fact, "heathen Greek."

DEATH OF THE ABBÉ F. MOIGNO.

It is with extreme regret that we announce in the present number of the magazine the death of our most esteemed and excellent member, the Abbé Moigno, of Paris, France. We feel the death of this great and good man as a most serious loss to our Society, for he was a champion of the weights and measures of the race, a full believer in the divine inspiration of the Great Pyramid, an earnest student and co-worker with us against the French metre even in his own country and against many of his own people, boldly daring to stand up for the right and denouncing the false measure as a device of the wicked. Nothing shows more fully how the barriers of prejudice are thrown down by our work than the union of this great man with our Society. Here was a Roman Catholic priest, earnest in his devotion to his church, and yet when he had studied the truths of the Great Pyramid all prejudice touching the question of Protestantism and Roman Catholicism vanished away and he was with us as a brother working in the discussion and dissemination of the truth and wisdom contained in the Pyramid of Jeezeh, as a monument of science and religion upon which all mankind could unite and come together.

He was elected a member of our Society, and upon the announcement of his election accepted it and declared himself to be a co-worker with us publicly, and published it in the *Cosmos Les Mondes*, a noted scientific journal, of which he was the editor

and founder. We were well aware that in taking this step he must suffer persecution ; and how far this went we cannot tell now, but we know that he was ousted from the directorship of the *Cosmos Les Mondes*, his own paper, and was informed that he would be attacked for having taken up the defense of the Anglo-Saxon measures against the French metre. We know from a letter written in his last moments that this was a trouble and grief to him. We feel his loss greatly, but in the dispensations of Providence he may speak louder in his death than in his life. On the 7th day of June, only three days before he died, he penned us a letter in English, written evidently with great difficulty, and said that he was not very well. He spoke of the bringing out of his last great work, the translation of 'Our Inheritance in the Great Pyramid' ; and nearly his closing lines expressed a hope for the success of the expedition to Egypt, and signed himself, "Your very old, but firm and devoted leader, the Abbé Moigno, Canon of St. Denis."

Three days after writing this letter the following appeared about him in a Paris paper :

A truly wise man and a true Christian, the Abbé Francois Moigno, Canon of the Second Order of the Chapter of St. Denis, passed to his rest from his domicile No. 2 Rue Strasbourg, at the age of eighty-one.

He was born in 1804 at Guemené (Morbien), son of a gentleman of Brittany, Moigno de Villebeau, who abandoned his title of nobility in the Revolution, having joined the order of Jesuits. He retired from it in 1844 because the publication of his 'Lessons upon Differential and Integral Calculus' was opposed by the superior of the order of the Jesuits. The Abbé Moigno preferred to go out of the order rather than to renounce his independence in his favorite studies. He was a laborer upon a number of Paris papers, and eventually established a journal, the *Cosmos*, which he afterwards joined to a paper, *Les Mondes*, under the title of the *Cosmos Les Mondes*. He was a friend of Ampère, Arago, Binet, Beudant, Thénard, Humboldt and Dumas. He had a prodigious memory, and spoke with fluency twelve languages.

He held many important positions of trust, and in 1873 was named Canon of the Chapter of St. Denis. He was chevalier of the Legion of Honor.

Among his important publications we may cite the treatise on the electric telegraph, a work on modern optics, a course of vulgar science, a work on physics and chemistry, and above all his great work upon the "Splendors of the Faith."

Having traveled over all countries of Europe, he preserved relations with all the wise men of the world.

Like most great men and writers he made no fortune, and his pension joined to his canonical position was his only means of existence.

We mourn his loss.

THE UNVEILING OF ISIS.

In the previous pages upon my subject I have confined myself to the historical, principally, in order to prepare my readers for the unfolding of the interior meaning.

Let it be borne in mind that the investigation into the subject of metrology is an inquiry into the origin of race and language, science and religion, and hence it has the highest and deepest, the widest and broadest significance of any subject under the sun. And since I must present in this discussion new thoughts and theories which will be considered unorthodox by some, and will be looked upon as the resurrection of so-called superstition by others, I can but repeat the prayer of my heart, uttered and re-uttered, "Oh Lord, if in my ignorance I should teach anything which is contrary to that which is eternal truth, forgive and overrule and bring to naught; but if all, or even any part shall be the truth, then may it sink deep into the hearts of the people." I believe I have the truth; as such I put it forth with confidence as worthy of the investigation of, and reception by, the people. It is only through the plain narrative of my story as it came to me that it will be understood and appreciated by them.

For years the vision of the woman clothed with the sun represented itself to me as a symbol of our banner, and I never could disassociate the three men whom I have characterized as the representatives of three saints or the Magi from the vision: Mr. Baldwin had declared that the crown of twelve stars represented the twelve States of the Union, but how could this be reconciled beyond the mere ideal? The analogy was not sufficiently strong to accept it as truth unless there should come some plain, tangible proof of a different kind. For this I sought earnestly, but the knowledge came only in years of thought as my mind from time to time would revert to the subject.

To fully unfold the steps by which I became acquainted with

and acquired a knowledge of all that I have gleaned since the presentation of the historical sketch which I have just finished would take a volume, and it may not be within the province of this Magazine to extend the explanation of my subject through so many numbers as it would require. It is only for me now to narrate as succinctly as possible the circumstances which led me to present this subject as 'The Unveiling of Isis,' and leave the details and the explanations and the proofs which are absolutely necessary to convince the general reader of the truth of what I present to a more extended work hereafter, or sketches from time to time in the Magazine itself as it may seem best. As far as the interior meaning of the subject had come to me in the spring of the year 1875, I had in my mind a vision—the vision of Saint John, in the first verse of the twelfth chapter of Revelation—three men standing the representatives of the grandest epochs of human history. The woman represented the church, the sun the greater civil power, the moon a civil power, the stars a civil power. And in seeking for a representative woman who would most fully fulfil in womanly beauty and character and position this symbol of the church, an ideal queen, Isabella of Spain, arose in my mind; and searching history I found these words by distinguished men: "By Isabella was accomplished the grand event of European policy, the expulsion of the Crescent; and through Isabella the most prodigious event of humanity, that which doubled its terrestrial domain." Again, "It seems as if Heaven had raised her up for two purposes—the overthrow of the Crescent and the discovery of the New World." (Spanish History.) And, again, the words of Bishop Arevalo, "Without reservation I declare that Nature has never produced, and that Providence has never crowned with a diadem, a woman who can compare to Isabella, the Catholic." And, again, this, "In the worlds of our planetary system the sun never clothed or illumined her equal." (Cardinal Ximenes.)

Our greatest commentators have said that when they wanted to find the fulfilment of a prophecy, they looked around in contemporaneous history for the words of the great writers, either in their books or in the newspapers of the day. Here

was the sun symbol presented to our imagination, the woman clothed with the sun, a crown of twelve stars above her head, and the moon under her feet, and without ever having a thought of the words of these men, but selecting that queen, who was, in my opinion, the very ideal of grandeur, to represent a church, I selected Isabella. I had taken the sun as the great civil power of the world, and the Crescent—that is, the Mohammedan power—under the feet of this very woman whose whole soul was animated with a determination to drive out this power from the domains of Spain; in a larger sense she represented Christendom; the Crescent was under the feet of Christendom, and, as a constellation, there arose in the dim future a vision of that government in the New World, the diadem of that woman's sagacity, and piety and self-sacrifice. She built a city in the form of a cross and called it, "The City of the Holy Cross," besieged the city of Grenada, the stronghold of the power of the Crescent, until on January 6th, 1492, on the day of the Epiphany, the feast of the kings of the Magi, she marched in and took possession, and drove out the Moors, occupied the Alhambra and hoisted the Silver Cross of the Crusaders above the Crescent on the top of the tower of Camaris. And thus was fulfilled the symbol of the moon of the Mohammedan power being under the feet of Christendom. She had said that until the great work of the expulsion of the Moors was accomplished she would not commission Columbus to go forth in search of the New World, but when her object was achieved she sought in every direction for means to assist him, and was ready to even pawn the Crown jewels, when a man by the name of Saint Angel came to her and offered her the money.

As I said before I could not disassociate from this symbol the grand figures of Columbus, Luther and Washington, and they always were present to my mind with the symbol of the sun-clothed woman above their heads in the heavens. The symbol in the heavens, therefore, seemed to shadow forth a new heaven and a new earth, and Columbus inspired by a great thought says: "I am the messenger of the new heaven and the new earth mentioned in the Apocalypse of St. John, after

having spoken it by the mouth of Isaiah, and the Lord showed me where to find it." At this time the trumpet of Luther had been heard as if to collect together the elect from the four quarters of the globe, and he said: "I do believe that I am that great trumpet which prefaces and announces the coming of the Lord." And when the new heaven and the new earth were discovered in the midst of the dire persecution that followed, a haven of rest was opened for the people of God; and there was a Washington raised up who defended the woman—the church of the wilderness.

While I was studying my subject the different names of those whom I called the "Magi" were analyzed. I found the name of Christopher Columbus fairly interpreted as the "Christ-bearer dove," and it seems as if the name was perfectly fitted to his mission, and I concluded that his crest ought to be a dove. Not until several years later did I find this to be true, when reading the life of Columbus, by the Count Roselly De Lorgues. I found that this crest was three doves, and that he had also taken the same thought in regard to the character of Christopher Columbus as truly the Christ-bearer dove and a prophetic person. In examining the life of John Huss, I found that he had exclaimed at the stake, "You are about to burn a goose, but in an hundred years you will have a swan you can neither roast nor boil." And a commentator said that he must have meant Luther whose crest was a swan. Then I searched and found that Luther was called the Swan of Eisleben. In examining the name Luther I found that it was very much related to the name *cleutehros*, freedom, and I was strengthened in this by one day explaining to General Garfield my thought, when he said to me, "Did you know that Luther was derived from the Greek word *cleutheros*?" I said that I did. Now, in thinking how this name was given to him I had pictured him as holding a book in his hand in the manner he is represented at Worms, and then this thought came into my mind "*liber*" book, and "*liber*" free, and "*liber*" tree, and from the tree came the book, for indeed from the papyrus tree came the ink, paper and pen. So the thought is extremely proper that the tree should be freedom, and that he should hold a symbol of it in

his hand, and that he should be the first man to translate it into the vernacular and to preach it in his own modern tongue. He said, "The Bible is a great tree, and sometimes I pluck off a few pears or a few apples." May it not be the tree with the twelve manners of fruits.

Then again, why *Martin* Luther? Then I sought and found that *Martin* was the name of the saint who was the grand symbol of the character of the man, for that saint was distinguished for overthrowing superstitions and paganism and was an extremely kind man to the poor.

In examining into the crest of Washington I found that it was an eagle, and an eagle is cut upon his tomb, and again the colors in his crest are red, white and blue. Then since I figured that the woman in the heavens was clothed with the sun, which must be red and white, and that she had stars, those stars must be in the blue. Then I plainly saw that Washington was the proper one to protect the woman, for his colors show that he was that personage, and all the colors are prophetically fitted to the one who should defend the church. Then I said, surely this is the Michael who was to come, and I began to analyze the word—Like unto God—God-like, and have we not had the term God-like applied to Washington in all languages? Then again, Michael was represented as a young knight overthrowing the dragon. Then I remembered that in the Capitol ground he is represented by a colossal figure as a god; and so also in looking into the dome of the Capitol at Washington he is represented as a god. Thus we have Christopher Columbus, the Christ-bearer dove, and the discoverer of the New World; we have *Martin* Luther, the prophet of freedom, who announced the coming of the Lord, and who holds in his hand the book of that country which Columbus found, whose symbol of the dove was perfectly adapted to the work he had to perform, inasmuch as he was upon an ark, and out of the ark must come a dove; and inasmuch as Luther was the swan, the trumpet bird, the fisherman-bird, a type of the church, whose duty it was to sound the trumpet and call the people together from the four quarters of the globe in order that they might escape from persecution by

flying to that country prepared by the dove, that the eagle should represent the great leader—the symbol of the warrior who was to defend the woman with his sword and overthrow that power of monarchy which dominated the country. Thus far the whole presented itself to me as a picture, and I desired to have it painted. It was at this time that I came to Cleveland to live, and as I was walking up Superior street my eyes fell upon a magnificent picture in Ryder's window—a picture called "Yankee Doodle"—three musicians, a fifer and two drummers and a standard bearer holding a flag and partly enveloped in smoke, leading a great troop up a hill, and to one side the dying artilleryman who is waving his hand and shouting in his death for victory. The old gray-haired drummer and the earnest fifer with his head bandaged, but still moving onward with determined purpose, and a young scion of the New World looking up with faith and gratitude into the old man's face as they go forward.

As I gazed at this painting I said the painter of *this* picture is the man to paint *my* picture. I sought him and after a long time found him. It was Mr. Willard. I went to him and said that I desired him to paint me a picture. After explaining it to him he said that he would do it. I then determined to try him on the question of finances, and told him he would have to paint it without money. He said that he would do it, as it was a grand thought.

Gazing intently one day at the picture upon which Mr. Willard was painting, a thought came suddenly upon a question partly before considered, and I said: "Mr. Willard, the vision in the heavens certainly typifies a date in history, and I am going out to find it." Poring over old histories and annals that evening at Case Library I came upon the letter of the distinguished divine, Hooker, addressing John Winthrop upon the great work of forming the first confederacy in the New World. He says:

"MUCH HONORED IN OUR BLESSED SAVIOUR: At the return of our magistrates, when I understood the gracious and desired success of their endeavor and by the joint relations of them all, not only your Christian readiness, but enlarged faithfulness in

an especial manner to promote so good a work, my heart would not suffer me, but as unfeignedly to acknowledge the Lord's goodness so affectionately to remember your candid and cordial carriage in a matter of so great consequence, laboring by your special prudence to settle a foundation of safety and prosperity in succeeding ages; a work which will be found, not only for your comfort, but for your crown at the great day of your account. It's the greatest good that can befall a man in this world to be an instrument under God to do a great deal of good. To be a "repairer of the breach" was of old counted a matter of the highest praise and acceptance with God and man; much more to be a means, not only to maintain peace and truth in your days, but to leave both as a legacy to those that come after until the coming of the Son of man in the clouds of heaven."

And then I found that the great act was consummated on September 7th, 1643, and that John Winthrop was the first governor. Turning from history to history I noted the grandeur of this epoch, the closing days of the thirty years' war.

In 1630 sailed the remarkable expedition under John Winthrop, in eleven ships. It is said in the Revelation that the woman fled into the wilderness upon the wings of an eagle. Here these Pilgrims claimed that they were intent upon fleeing to the wilderness to establish a church where they could worship God according to their conscience; and then I found that the name of the flag ship was the great ship Eagle, the name being changed then to Arabella, in honor of a most noble and pious woman who sailed in the great ship Eagle (Bancroft), and in the wilderness the noble leader of the band became the first governor of the new constellation in the west.

1643 was a date of great expectation. The colonists confidently looked for the coming of the Messiah in the clouds of heaven. Vennor was killed in the streets of London at that time, declaring that the fifth kingdom was at hand—the kingdom of Jesus Christ. "In the execution of my western enterprise to India," said Columbus, "human reason, mathematics and charts availed me nothing; the design was simply accomplished as the prophet Isaiah had predicted. Before the end

of the world all the prophecies must be fulfilled, the gospel preached all over the earth, and the holy city restored to the church. The Lord wished to do a miracle by my voyage to India. It was necessary to hasten his purpose, because according to my calculations there only remain one hundred and fifty-five years to the end of the world."—Letter of Columbus to Ferdinand and Isabella (See Humboldt's *Examen Critique*, Tome, 1615).

It will be noted that the calculation of Columbus would bring the consummation about the time of the rise of the United Colonies of New England. The annals of Scotland and England mention wonderful sights in the heavens, armies marching and counter-marching, also remarkable astronomical phenomena, a great movement in the under spiritual world. At the moment of the rise of the United Colonies of New England a wonderful scene presented itself. A king about to barter away the dearest rights of the people of God in an unholy alliance—an alliance with those who had prepared the armada for England's destruction—a king who had wasted the substance of the people by putting monopoly in the hands of his favorites, who had claimed the right to sacrifice the substance of the people and levy war, and finally to destroy the great King's daughter, the church. Then arose Oliver Cromwell, the St. George of the age, and said, I will protect the great King's daughter.

Then we see a nation's representatives on their knees in St. Margaret's Church, September 25, 1643, lifting up their hands and swearing—what does Carlyle say of it?

Monday, September 25, 1643. The House of Commons and the Assembly of Divines took the covenant, the old Scotch covenant slightly modified now into a solemn league and covenant, in St. Margaret's Church, Westminster. They lifted up their hands *seriatim*, and then stepped into the chancel to sign a very solemn covenant and bond of all the people. of the awfulness of which we, in these days of regardless talk, cannot form the slightest notion.

Just before the king's head was struck off he took his St. George and handed it to the Bishop and said, "Remember," and his remains went to the Chapel of St. George, and then

St. George's Cross became more famous on sea and land than ever before, so much so that the children of Judah came from the east to see if this might be the promised Messiah, and he *was* the forerunner to the Jew as a good Israelite himself. As wrote New England to Oliver Cromwell: "We believe that you are fighting the battles of the Lord." God bless and keep green the memory of the giant so little understood and give us a heart to rear a monument to him as to our St. Michael.

Deeply impressed with the importance of my research and discovery I returned to Mr. Willard's study the next afternoon late, and standing before the picture when he was at work, I said: "I have found the date, which the picture represents, it is the 7th of September, 1643, old style, in the morning."

"How do you make it out?" said he.

"That I cannot now tell, but some day I will know; I know that I have the truth."

The picture as painted seemed as a talisman, and to some the thought will be an absurdity. It would have appeared so to me had I not been startled with other coincidences in this direction. We may be sure that there is more in the painting or engraving of a constellation than appears upon the surface. This mysterious influence which reveals, which attracts and repels, invisible, subtle as the most subtle of all known things, is no more wonderful than the power which enables one to read the elements deep down in our mother earth. It surely is given us to know this beyond all controversy, and this I am well aware by personal experience. Looking intently at the picture that September afternoon as the sun was sinking in the west, and the clouds were tinged with its rosy hues—Mr. Willard was painting upon the constellation or sign in the heavens—suddenly a thought flashed upon me, and I said to him, "You are painting in September, why, the sun clothes the constellation of Virgo in the month of September, formerly it was in August. What would you say if the Crescent moon was at the foot of the constellation of Virgo on the 7th day of September?"

"Well," said he, "I should consider it a remarkable coincidence."

"It is certainly there," I said with emphasis. "It must

have been there at that time, I shall prove it. And now what does the crown signify?"

I went at once into the reference room at the public library and searching astronomy, immediately came upon these words, "The Corona Borealis is Ariadne, or Virgo's crown, because it rises after the constellation of Virgo. I then examined the figure of the heavens to see how the crown was placed, and in the particular planisphere examined, I found twelve stars shown almost in a circle, the principal of which is Alpheca. The constellation, however, has more stars in it. The coincidence was so strong that I felt that I must have the signification; so I took the planisphere to Mr. Willard, and had him place the stars according to the arrangement then found. And so I fixed upon the canvass the meaning—that is, the date—viz., 1643, 7th September, 9 A. M. I then wrote to Simon Newcomb, astronomer at Washington, and told him what I desired, and his answer was: "I do not believe in the prophecies, but here is your solution." This gave a perfect representation of a woman clothed with the sun, and the moon under her feet, and upon her head a crown of twelve stars. This was extremely gratifying to the feeling in my heart that I was near the truth, yet I raised objections. The prayer was always in my heart, "Lord, reveal the truth to me in this matter." Yet, when so much came, I was like Gideon when he had asked that the Lord would grant him a sign that he was to save Israel, and it had been given him in having the fleece of wool wet with the dew of heaven while the ground about was dry, and he said, "Let me prove I pray thee but this once with the fleece, let it now be dry upon the fleece, and upon all the ground let there be dew." And the Lord gave him the sign as he desired. So I said, "This seems true, I believe it must be so, but where are the United States? How can the constellation of Virgo be clothed with the sun on the 4th of July?"

And how is it that the 19th of May should be celebrated as the rise of the united colonies, of New England, and historians should be at fault. But going carefully over the records I found that surely on the 7th of September must have been placed the last signature of the colonies' and John Winthrop's seal and

sign. This seemed sure ; but now came the difficulty, and one year passed away from 1876 to 1877 during which time my railroad duties were absorbing, and I dare not let these be neglected, and although in leisure hours I would seek earnestly for a solution, it was not until the year had rolled around to September again that the thought came, surely I must be wrong in looking for a duplication of the sign in July 1776, for it is impossible. But looking over old papers and records again I came upon the speech of John Quincy Adams. At the second centennial anniversary of the rise of the united colonies of New England, in which he said : “ The New England confederation of 1643 was the model and prototype of the North American confederation of 1774.” In both cases it was the great law of Nature and of Nature’s God to advance the kingdom of our Lord Jesus Christ and to enjoy the liberties of the gospel in purity and peace. An empire already bounded only by the Atlantic and Pacific oceans, and to the eye of prophetic inspiration to be bounded hereafter only by the eternal ice of the northern and southern pole. And then I was suddenly struck with the thought that I had been looking for the wrong date—1776 instead of 1774—and now came the question, when in 1774 ? and I at once jumped to the conclusion, September 7th. Of course the date of the first prayer in Congress is commemorated in a grand picture, and history says that only one knelt then, and that was George Washington. Surely the 7th of September must be the duplicate date. Now to prove it, why the sun must clothe the constellation of Virgo and the moon must be under her feet. How many chances are there that this would not be, to one that it would ? I took my book and calculated the position of the moon. The sun surely was right for the symbol, for it was at the head, and if the moon should be at the foot then the sun would naturally clothe the constellation of Virgo in order to illuminate the crescent moon, but to my great disappointment the position of the moon was in the centre of the constellation of Virgo, and I was cast down, for I said surely that date, the 7th of September, should be duplicated. But I remembered that the first date was old style—7th September—which made it really the seventeenth day of Sep-

tember new style. I thought that in this calculation I might have used wrong elements ; so in going to my office I met Professor Harding, of Brooks' school, and asked him if he knew an astronomer in the city who could calculate the exact position of the sun and moon at a date far back. He said that he did. that Miss Fisher, of the Brooks' school, would make the calculations for me. And that he would get her to do it. The question I asked was this : " At what hour, minute and second in the month of September 1774 was the moon at the foot and the sun clothing the constellation of Virgo ? " In two weeks the answer came : " Moon at foot of Virgo (Phil. mean time) 1774, September 9th, 7 hr., 51 m., 50 sec. 44 long. of sun at same time $167^{\circ} 33$, or several degrees above head of Virgo."

The 9th of September ! What a disappointment ! How could it be ? I had set my heart upon the 7th because it was a duplicate day of the rise of the united colonies of New England, and certainly I never heard of anything important having occurred on the 9th of September, 1774. It was that day of which Samuel Adams wrote to his wife.

Here was a disappointment. I had expected it would be the 7th of September, 1774, for I had made up my mind that it should be the duplicate, the one of the other, but instead of this here was presented the 9th day of September. For a moment I was entirely cast down, but I went on my way to the office, and passing a book store, I went in and took up the history of the United States, by Bancroft, and there, turning to the date, 1774, my eyes fell immediately on these words : " ON THE WISDOM AND ON THE EXERTIONS AND ON THE FORTITUDE OF THIS IMPORTANT DAY IS SUSPENDED THE FATE OF THE NEW WORLD AND UNBORN MILLIONS."—Joseph Warren, in Suffolk County Convention, *9th day of September, 1774*. The conviction came to my mind instantly that this must be the date, and though I had, as I said, fixed upon the 7th day of September, I had found that this would not fit the position of the heavens. I had sought another person's aid in calculating. This calculation gave the 9th of September, and then I found a date with which I was utterly unacquainted, one of the most remarkable of all American history.

Paul Revere was sent post haste to Philadelphia on horse-back with these resolves, and they were presented on the 17th day of September, just eight days after their passage. They were passed again as the first solemn act of the first Congress of the United Colonies of America, and history calls them the first Declaration of Independence. This date had never made any impression on my mind nor had I known of it. Some of the most remarkable dates in history are concealed entirely until the time it is necessary to bring them out. General Gates, when he had news of the promulgation of this act, said that they must have been drunk with new wine. The answer was, "Not so, for it was not yet the third hour of the day." Here would be noted a very curious combination of dates. On the 7th or 17th day of September, 1643, was passed the Scotch Covenant by the House of Parliament. September 17th, 1630, the date of the foundation of Boston. The 7th, 1643, also was the rise of the United Colonies of New England, that is Old Style—New Style, the 17th.

But the initial point we see is the 9th day of September, 1774, when General Warren and his followers, with their lives in their hands, made that wonderful declaration called the Suffolk resolves. I felt that I had the duplicate, and it was brought to my attention only through the position of the heavens and astronomical vision; and yet with these proofs I did not feel so thoroughly convinced but that I would be sometimes shaken with the impossibility of a prophet having given proofs of the rise of our republic by the position of the sun, moon and stars.

During this year (1877) I had the picture drawn by Mr. Willard for the purpose of photographing it, and I gave a short description of it upon a card, determining to send it out among my friends privately, that they might examine and criticise it. When I had a number of these cards printed, photographed and prepared for distribution, then for the first time did I really comprehend the importance of what I was doing, and I said, "Have I the right to publish to the world a new version of that seemingly sealed book, the Apocalypse of Saint John? Have I the right, unworthy as I am, to attempt to unfold these

mysteries? This first verse of the twelfth chapter of Revelation had been called a key of the Apocalypse by many. It was and has been a stumbling block to commentators. Mr. Baldwin had said—and he was the only one—that the twelve stars represented the twelve United States.

Then these words of Luther came distinctly to my mind, "Every man must interpret the Scriptures for himself." And yet with this I said, "I wish that I had convincing proof to my mind that I have a right to promulgate this thought, and that I may have a sign to prove to me that I have it." I retired that night more thoughtful than usual and deeply impressed with the importance of the matter I had in hand, hoping that something would come to convince me of the correctness of my position. Next morning I awoke early with my mind intently fixed upon the same thought, and I said to myself, "How shall I get this sign?" Then came the Scripture to me of the sign of the Prophet Jonah; but in a moment my little girl came rushing into the room and said, "O, papa, look at the American flag in the heavens." I was loth to be disturbed, but got up and went to the window, and there observed a bright picture of the Stars and Stripes in the heavens, calling to my mind,

"He striped its pure, celestial white
With streakings of the morning light."

I was in the habit of selecting a verse of Scripture for my children to repeat at the breakfast table, and the thought came that the verse that I should select for that morning might strengthen and guide me. When I opened the Bible, I saw but one verse—the seventh verse of the fiftieth chapter of Isaiah—*"For the Lord God will help me; therefore shall I not be confounded; therefore have I set my face as a flint and I know that I shall not be ashamed."* This it will be noticed is called "bibliomancy," and there was a time when the Pope's Bull was issued against its practice, but it had been the practice for some time of my own mother, and I could not consider it wrong. I believe that this verse was given me to sustain and strengthen me against the doubts and fears of my own nature and my mistrust, not only of worldly persons, but of ministers in the church; and so I placed it at the bottom of my picture under

the coat-of-arms of my father and my mother. In this year I determined to have a large picture painted making each one of the figures full size. And I had Mr. Willard study particularly the figures and faces and the characters of Columbus, Luther and Washington. It was my desire to present Columbus in a prayerful attitude, thanking God for the consummation of his hopes and prayers. I desired to have Luther placed in a position as at Worms with an open book in his hand, inasmuch as he was a prophetic character representing the angel of the tenth chapter of Revelation. I had him represented with an aureola over his head and in a prayerful attitude. I desired these figures to be changed in expression to give them an attitude of prayer. To this Mr. Willard demurred, saying that it would be impossible; but when I urged it he attempted it, and was successful in giving the desired expression. In Washington also I wanted the prayerful attitude, representing him at the time of the surrender of Cornwallis at Yorktown, when a nation as well as the army were on their knees. Each of these characters would have the birds which they represented—namely, the dove, the swan and the eagle. Upon examining the books upon the subject I found that it was the custom in ancient times to portray persons who had holy missions with birds' heads, as St. John was painted with an eagle's head, and St. John may be considered the eagle prophet. Columbus was represented with a staff and the banner of his mission, upon which was represented the Saviour upon the Cross, and above Christo Ferens. Columbus always signed his name with the letters

S
 S A S
 X M I
 X P O F E R E N S

which was a prayer, and below this,
Scrvus suplex altissimi Salvatoris—Christus, Maria, Joseph—
 Christo Ferens.

During the year 1878 I noticed the remarkable earnestness with which the ladies of Boston had taken hold of the preservation of the old South Church. Mr. Willard's painting had been sent there and placed on exhibition, and it struck me that the Suffolk Resolves ought to have been passed there. I determined to investigate the matter.

In June I attended the Convention of the American Society of Civil Engineers in Boston, and I entered the old South Church for the first time on the 20th of June and examined its historical points. I endeavored to examine into the Journal of General Warren, but the representative of the Warren family was not there, and I could not see the book. It occurred to me that some old letters of the Warren family, or some of those who were present at the passage of the Suffolk Resolves would disclose something more important than would be found in history about the remarkable character of the proceedings of that day. So I left the place and went to the State House and there found something that I much desired to see—namely, a statue of General Washington, and a remarkable slab presented by Earl Spencer to Charles Sumner, and by him presented to the Commonwealth of Massachusetts. Here I also saw a photo-lithograph which was presented to me of the inscriptions on these slabs. This was very interesting and showed positively the colors of the red, white and blue and the stars, and convinced me of the correctness of my thought that these were the same as the colors in the vision of the heavens, and that his crest was an eagle. This surely pointed out Washington as the one who should defend the woman or the church, the representative of Michael in the New World. Going from there to the city library I examined all the old documents and records I could find in relation to the Suffolk Resolves, to find the place of their passage, but was disappointed. I sought the life of Paul Revere. I was directed to the Historical Library. Rain began to fall and I was discouraged. It was Saturday, and I concluded that I would have to leave the city without having completed my mission. I went to the hotel, paid my bill and was about to leave, when I met the landlord, Mr. Wollcott, at the door.

He asked me what things of interest I had seen, and I told him that I was about to leave the city discouraged. He asked why, and I said, "I am seeking for a house where the Suffolk Resolves were passed." He said, "I am your man. I can tell you the very house, and there is a marble slab in that house which will give you important information. Mr. Latimer I pass that house every day, and I never pass it without taking off my hat. This reverence is involuntary." I said, "I shall stay to-night and go to that house to-morrow after church." The next day, without my dinner, I made directly for Milton, where he said I would find the house near the Old Colony Depot. It was half past two o'clock on Sunday afternoon, on the 23d of June, when I stood in front of the house, a two-story frame building, well preserved, with a portico in front. It might have been called a handsome house in its day. Before it stand three remarkable elms. I was struck with the size and grandeur of these trees, and I thought of the tree of which Luther spoke. There is something in the elm of more than ordinary significance. On the front of the house there was an inscription, "In this mansion on September 9th, 1774, at a meeting of the delegates of every town and district in Suffolk, the memorable Suffolk Resolves were adopted. They were reported by Major General Warren, who fell in their defense in the battle of Bunker Hill. They were approved by the members of the Continental Congress in Philadelphia, on the 17th of September, 1774. The Resolves to which the immortal patriot first gave utterance, and the deed of that great day upon which he fell, led the way to American independence. Posterity will acknowledge the virtue which preserved them free and happy." When I had read these words, I said, "This is the birthplace of American Liberty, and the Lord has shown me where to find it."

I said that the thought came to me that the Suffolk Resolves had been passed in the Old South Church. In this I was disappointed, but upon examination of the history of the Old South Church I found that the very spot upon which it stands was the prophetic spot of the rise of the United Colonies of New England in 1643, when John Winthrop must have signed the articles of confederation. I said once to Mr.

Willard that the flag might be said to have been born in the Old South. And when I got its history, and saw the account of the hoisting of the flag on the Church in 1861, I read the words of the orator, "We welcome thee back to thy natal spot, to the place where thou wert born, flag of the free."

It is a strange coincidence touching this subject of astronomy or astrology, that the position of the heavens at the moment when I stood before the house was the same as on the 9th day of September, at 9 o'clock in the morning, 1774; this time that I stood there being between 2 and .3 o'clock in the afternoon of June 23rd.

I endeavored to gain an entrance to the house, but the child who came to the door said I could not go in on Sunday, but I must go to Mr. Safford, the owner. He received me very cordially, and when I explained my mission he gave me all the information in his power.

My first question was: "What time did this meeting take place?" He said, "Between 9 and 10 o'clock in the morning." I asked him what time they passed the Resolves. He said that as far as Mr. Frothingham, who was examining the subject, had been able to find out that they passed late in the afternoon. I asked him if he had no letters of a private character which would give information about that remarkable day, and he said that Mr. Frothingham had collected many letters on the subject. He then read to me a portion of his address delivered on the centennial of the passage of the Resolves on September 9, 1874, which was about the beginning of the centennial celebrations. He informed me that a part of the resolves would be found in gilt letters on the inside of the house, and said that the fact that our forefathers looked upon this confederation of the colonies as a religious confederation, lent color to my thought.

When reading the editorial remarks upon the address of Mr. Safford, I was struck deeply with these words which confirmed my own utterance: "It seems to be a part of the duty of the good people of Milton to cherish the old house and its inscription, and preserve it intact as the birthplace of American liberty."

I cannot think of the circumstances which surrounded our forefathers at the time of the passage of these resolves without thinking of Bethlehem. These men had desired to meet in the old South Church, but they could not; they were forced outside. Therefore Liberty could not be born in the city because five thousand troops occupied the neck, and they could not enter. Hence their meeting had to be in this old house. Then I thought, here is a duplicate. This, it seems to me, was the birth of Christ's kingdom. Here was a similar situation, and they all had to go outside of the city, and liberty was born there. It is said in the Scriptures that the star stood over the place where the young child was. "Surely," I thought, "this may be the same thing," and I concluded that 4 o'clock was the time of the birth of these Resolves, and that the Corona Borealis marked the passage of the Resolves in the afternoon of the 9th day of September, 1774. Then I recalled the fact that at sea in taking observations as we stood near noon watching the sun rising to its culmination, we would say, "Is the sun on the stand?" Then the thought came, "Is this constellation passing the meridian at the exact moment of the birth of this child?" And then I thought, "This Corona Borealis must have been over Jerusalem at the moment of Christ's birth.

I afterwards found from Kepler's works that it was a constellation that marked Christ's birth, and not an ordinary light. This of course is a natural thought. On my return I asked Professor Stockwell, the astronomer, to examine the position of the Corona Borealis in the year One, or the beginning of the Christian era, to see whether it was vertical over Jerusalem at that time, which he did. And it was there, having moved about nine degrees north in 1800 years. I then sent Dr. Seth Pancoast, of Philadelphia, who has given much attention to the study of astrology, a copy of my picture—the Stars and Stripes of the Magi—and asked him if he could give me any assistance. His answer came: "What you are seeking is the UNVEILING OF ISIS, but neither you nor any other man can unravel that mystery, unless you understand the subjective Kabbala. You are beginning at the wrong end; you are beginning with the

objective Kabbala." Up to this time I had not thought of the subject of Isis, nor did I comprehend its meaning.

This brings me to the last phase of my subject, which I propose to present and finish in the next number.

CHARLES LATIMER.

METRIC SYSTEM PROPOSED BY MR. JACOB M. CLARK.

(Arranged from correspondence with the Committee on Standard Time).

Adjustment: increase the English inch, and also the Arabian gauge or guz (= 25 English inches) each by its 1-1000 part.

For the Arts: Inch decimally subdivided.

Denomination.	Metric Feet.	
City, or Builders' chain,	100.	=40 cubits = 5 rods = 4 perches. Value, =83.416+ English feet.
" reed,	10.	=4 cubits
" foot,	1.	the natural foot.
" inch,	.1	=value, 1.001 English inches.

City lot = 30×120 feet = 13×48 cubits metric. 10,000 inches metric is the entire boundary of a square acre.

Engineering and Geodesy: Cubit decimally subdivided.

Denomination.	Metric Cubits.	
Earth's semi-axis (polar,)	10,000,000.	Grand Unit for Astronomy and Geodesy,
Acre (side),	100.	convenient length for steel tape-chain. value = 208.5416+ English feet.
Perch.	10.	Convenient length for base-bar, value = 20.854+ English feet.
Cubit,	1.	Unit for engineering, leveling, etc.; value 25.025 English inches.

Solid cubit, the measure of engineering quantities.

Superficial acre of 10,000 square cubits contains 43.489 and 44.100 square English feet and differs from the English acre by 1.6 of 1 per cent.

Adaptations for Rural and Commercial Purposes.

8 cubits = metric rod = 200 inches metric, for land, etc.

2 cubits = metric staff = 50 metric inches for wood, etc. The metric cord = about $1\frac{1}{4}$ present cord.

Metric ell = 40 metric inches, for cloth, etc.

Circular Measure : Time, arc and angle measure.

Denomination.	Metric Degrees.	
Circle,	240.	The quadrant=60 degrees metric. The Zodiacal sign=20 " " =1½ degrees, current division.
Metric hour angle,	10.	
" degree,	1.	
" minute, or prime,	.1	
" second,	.01	
" third,	.001	

Geographic : Road and sea measure.

Denomination.	Metric Miles.	
Mean great circle,	24,000.	} terrestrial, upon radius of volume.
" degree,	100.	
" offing,	10.	
Metric mile,	1.	Value=5472 Eng. ft. = { The True Turkish mile ¼ of ancient parasang .½ sum of Jewish mile and Sabbath day's journey.
Metric stadium,	.1	=Stadium of Posidonias.
" road-chain,	.01	{ Knot-measure, glass 1-100 an hour. = Mast-length, the height from which the horizon appears ten miles away.
" fathom,	.001	=3 Jewish civil cubits (Mosaic).
" span,	.0001	=0.2624 cubits=6 and 56-100 ins. metric.

Metric furlong, or cable length=125 fathoms.

(Kilometer of France=6-10 of metric mile, very nearly).

8 furlongs, or 10 stadia, or 328 rods. . . . or 2,624 cubits, or 6,560 feet metric	} =one mile and	{ ¼ mile=41 rods. ¼ furlong=41 cubits. 1-16 stadium=41 feet metric.
--	-----------------	---

ANALOGUES OF AVOIRDUPOIS POUND.

FROM ALEXANDER'S "WEIGHTS AND MEASURES."

NAME.	LOCALITY.	VALUE, AVOIRDUPOIS POUNDS.
Agito	Pegu.....	0.848214
Arratel.....	Portugal.....	1.011860
Cheki.....	Bassora.....	1.028571
Frongeweight.....	Augsburg.....	1.082621
Funt.....	Cracow.....	0.894929
Funt—old measure.....	Poland.....	0.894929
Funt—since 1819.....	".....	0.894089
Funt.....	Russia.....	0.901691
Krinne—small.....	Graubundten.....	1.147243
Libbra—peso grosso.....	Belluno.....	1.139150
Libbra.....	Corfu.....	0.900419
Libbra, of Venice.....	Ionian Isles.....	1.051857
" new standard.....	".....	1.
" peso grosso.....	Padua.....	1.072663
" peso grosso.....	Rovigo.....	1.052379
" peso grosso.....	Treviso.....	1.139250
" peso grosso.....	Venice.....	1.052750
" peso grosso.....	Verona.....	1.101986
" peso grosso.....	Vicenza.....	1.072663
Libra.....	Acapulco.....	0.014286
" for chocolate.....	Alicant.....	1.046571
".....	Billbao.....	1.078800
".....	Callo.....	0.014286
".....	Canary Islands.....	0.014843
".....	Caraccas.....	0.014286
".....	Castille.....	0.016097
".....	Catalonia.....	0.882
" sutil.....	Gallicia.....	1.016286
".....	Gibraltar.....	0.0175
" English.....	".....	1.
".....	Guatemala.....	1.014286
".....	Madeira.....	1.010929
".....	Madrid.....	1.016097
" menor.....	Minorca.....	0.882
".....	Mexico.....	0.014286
".....	Montevideo.....	0.014286
".....	Seville.....	1.015337
".....	Valparaiso.....	0.014286
".....	Vera Cruz.....	1.015337
Livre—old measure.....	Amiens.....	1.017286
".....	Antwerp.....	1.036668
".....	Arles.....	0.862681
".....	Avignon.....	0.901143
".....	Besancon.....	1.064943
" old measure.....	Bordeaux.....	1.09
" new measure.....	".....	1.102369
".....	Bourbon Islands.....	1.079219
".....	Bourges.....	1.032571
" commercial.....	Brussels.....	1.031143
" for gold and silver.....	".....	1.084740
".....	Cambrai.....	1.036286
".....	Carpentras.....	0.881895
" metrical.....	France; till 1840.....	1.102369

NAME.	LOCALITY.	VALUE, AVOIRDUPOIS POUNDS.
Livre—poids de marc	France; before 1800	1.079219
" for silk	"	1.011768
" apothecaries, new measure	" since 1837	1.102369
" current	Geneva	1.101816
" old measure	Grenoble	0.920186
"	Savoy	1.079219
"	Haiti	1.079219
"	Lausanne	1.102369
"	Liège	1.029879
" jewellers	"	1.084913
" old measure	Limoges	1.062514
"	Louvain	1.034614
" commercial	Lyons	0.944317
" for silk	"	1.011768
" poids de marc	"	1.079219
" commercial	Marseilles	0.899349
" commercial	Mons	1.026457
" jewellers	"	1.084264
" old measure	Montpellier	0.887259
"	Namur	1.028729
" old measure	Nancy	1.004714
" old measure	Nantes	1.090071
" commercial	Neuchâtel	1.146710
" for gold, silver, etc.	"	1.079219
" wholesale	Rouen	1.122378
" of Alsace; old measure	Strasburg	1.037711
" old measure	Toulouse	8.099430
" old measure	Tours	1.048857
" old measure	Troyes	1.146464
Mina	Ancient Attica	0.962582
Nen	An-Nam	0.860950
Pfund	Aarau	1.050747
"	Aix-la-Chapelle	1.029703
" for spices, etc.	Appenzell	1.025549
" old measure	Augsburg	1.041943
" apothecary	Austria, generally	0.926
"	Baden	1.102369
"	Basel	1.079232
" since 1816	Berlin	1.031180
" before 1816	"	1.032895
"	Berne	1.146710
"	Bremen	1.099062
" old measure	Breslau	0.902067
"	Brunswic	1.0306
"	Bohemia	1.134
"	Cologne	1.030611
"	Dresden	1.029265
"	Frankfort	1.114073
" for gold and silver	"	1.031552
"	Gotha	1.030510
"	Hamburg	1.067886
"	Hanover	1.079444
" old measure	Heidelberg	1.112382
"	Hesse-Cassel	1.067534
" for gold and silver	"	1.031310
" since 1821	Hesse-Darmstadt	1.102369
"	Holstein	1.067975
" old measure	Konigsberg	1.032940
"	Leipsic	1.030598
"	Lippe	1.030596
"	Lubec	1.068744
" old measure	Luneburg	1.073

NAME.	LOCALITY.	VALUE, AVOIRDUPOIS POUNDS.
Pfund	Mecklenburg	1.067154
"	Nurnberg	1.124321
" for gold and silver.....	"	1.052
" old measure.....	Oldenburg	1.059083
" legal.....	Prague.....	1.134286
"	Prussia.....	1.031180
"	Rostock	1.120452
" for gold and silver.....	S. Gall.....	1.033131
" for gold and silver.....	Schaffhausen.....	1.014190
"	Solothurn	1.143110
"	Weimar.....	1.030598
"	Wurtemberg.....	1.103114
" for gold and silver.....	Zurich.....	1.035682
Pond; of Brabant	Amsterdam.....	1.037080
" Troy.....	"	1.084740
" former.....	"	1.087875
Pound; imperial.....	England, since 1825.....	1.
" Troy.....	Scotland.....	1.088778
" avoirdupois.....	United States.....	1.
"	Denmark.....	1.100885
" for gold and silver.....	"	1.038000
"	Sweden.....	0.937284
Ratel; mean	Persia.....	1.025
Rautul.....	Travancore.....	0.999664
Rotl or Rottólo; { feuddi; for gold and silver.....	{ Algiers.....	{ 1.096714
"	Bet-el-faki.....	1.019531
"	Cairo.....	0.950312
"	Guinea.....	0.953782
"	Tripoli in Africa.....	1.112095
"	Tunis.....	1.091547
Rotólo.....	Genoa.....	1.15359
"	Majorca.....	0.92794
Seer; commercial; mean of 22.....	East Indies.....	1.049423

ANALOGUES OF 10 POUND WEIGHT, (STONE.)

NAME.	LOCALITY.	VALUE, AVOIRDUPOIS POUNDS.
Balman	Shiraz	10.12687
Dhurra; mean of 16.....	Hindustan	10.047190
Pussaree	Calcutta	10.266137
Stein; for wood or feathers.....	Altona	10.6975
"	Baden	11.023685
"	Solothurn	11.4311

ANALOGUES OF 100 POUND WEIGHT (CENTAL).

NAME.	LOCALITY.	VALUE, AVOIRDUPOIS POUNDS.
Caban ; of rice	Ternate	100.333333
Cantaro ; since 1816	Alexandria	95.50
" " for cotton	" " " "	95.
" " " "	Balcaric Isles	91.73
" " " "	Florence	112.3
" " grosso	Genoa	115.31
" " sottile	" " " "	104.83
" " " "	Leghorn	112.3
" " piccole	Naples	106.080
" " " "	Tripoli in Africa	111.20954
" " barbaresco	Minorca	88.20
" " " "	Tunis	109.1547
Cariolla ; for salt	Santa Maura	104.13
Centner ; actual measure	Breslau	113.44
" " " "	Darmstadt	110.23685
" " " "	Copenhagen	110.11
" " " "	Norway	110.11
" " " "	Nurnberg	112.4321
" " " "	Prussia	113.44
" " " "	Zoll-Verein	110.23685
Centenar	Amsterdam	108.94
Hundred-weight ; nett	England ; 1300	100.
" " " " for sugar and wax	" " " "	108.
" " " " for wool	" " " "	110.
" " " "	Great Britain	112.
" " " "	Maryland	100.
" " " " for coal	" " " "	112.
" " " "	United States	112.
Lagel ; for steel	Prussia	103.11550
Last ; commercial	Amsterdam	85.245696
" " commercial	Lubec	96.930940
Kichkar	Anc. Hebrews	96.258287
Maund ; mean of 6	Bengal ; prov	85.541833
" " mean of 2	Malda ; prov	100.45
" " for cotton ; mean of 2	Malwah	86.4745
Moosa	Cyprus	112.
Oder	Majorca	100.217784
Quintal	Aragon	109.738476
" " " "	Bordeaux	110.23685
" " " "	Buenos-Ayres	101.4178
" " " "	Canary Islands	101.483944
" " " "	Castille and Chili	101.6097
" " old measure	France ; generally	107.9219
" " Castillian	Gallicia	101.6163
" " " "	Majorca	89.95327
" " barbaresco	" " " "	92.794247
" " old measure	Marseilles	89.931222
" " " "	Mexico and Peru	101.6097
" " " "	Minorca	91.537533
" " " "	Valencia	109.728476
Quintale ; peso grosso ; old measure	Venice	105.275
Scroon ; for raisins ; mean	Malaga	88.908488
Talanton	Ancient Babylonians	96.258295
" " Ægnetic	Ancient Greeks	96.258295
Talento ; actual measure	Ionian Isles	100.

The surprising range of the analogues of the avoirdupois pound in the metrics of the world is suggestive of the question whether, after all, the idea of John Quincy Adams, in effect,

that systems or standards of measurements preceded the organization of society, is not a pretty close shot at the truth. It will be understood, in reading the table, that if the linear dimension had become degraded or exaggerated by 5 per cent., the cubic dimension would be affected by a little over fifteen. Accordingly I have taken the limit at 15 per cent. either way. Under a less stringent rule the list would, of course, have been more extensive. The entire conspectus embraces the varieties of the mark, which I conceive to be derived from the Roman *as*, and of the troy and apothecary pounds, representing the Roman *pondus* and *nonnumcium*

In the table of linear and square measure, submitted some time ago, no attempt was made, further than to suggest something that would practically meet the wants of the American people. And the writer had remarked (Trans. Am. Soc. C.E., Dec. 1881) that "the inch being subordinate, it remains a question whether weight and capacity should not be founded on the radial cubit" Further investigation has shown, however, that if we raise the itinerary span, as the writer gave it, to the third power—*i. e.*, $(6\frac{5}{10})^3$ Pyramid inches³ = $282\frac{3}{10}$ cubic Pyramid inches, we strike the imperial gallon of 10 pints, and in water a weight of 10 avoirdupois pounds, close upon the present scale of usage. It is a question, then, whether the pint and the pound should not be regarded as fundamental units rather than the ounce and the grain. It does not affect the logic of Totten's principle one way or the other, but simply shifts the transition factor in his grander and more comprehensive scheme to another place in the scale. And this accords with Professor Piazzi Smyth's idea of the relation of the pint and the pound to the coffer in the king's chamber.

In the ultimate adjustment and re-arrangement of our methods of expressing the correlation between weight and capacity and the various forms of force or "modes of action," which Colonel Stephen M. Chester insists is both feasible and necessary, it is apparent that the π -relation must come in somewhere. The span is both π -related and earth-commensuric under the most perfect division of the circle. It monuments, at the same time, the fact and amount of the earth's ellipticity. It is a natural

human measure and it is cosmic. These considerations confirm me in the belief that the pint (or the imperial gallon) and the pound will be the units for scientific purposes. But I see no reason why the ounce, $\frac{1}{16}$ of a pound, should not also be a unit for its own appropriate sphere. And, if the habits or convenience of any people create a preference among them for the mark or the troy pound, they could be adjusted respectively at eight and twelve ounces. As there must always be individuals, so there must always be separate nationalities. But the correlations between their methods can and should be expressed by simple factors. Fractional arithmetic, too, is indispensable for the minor affairs of traffic and industry.

JACOB M. CLARK.

NEW YORK, August 8th, 1884.

GLIMPSES OF OUR CELTIC ANCESTORS BY EDWIN WILMSHURST RETFORD, NOTTS, ENGLAND.

PART II.

We left Pudens, the Roman Patrician with his Cymric wife Claudia, on military duty, at Regnum (now Chichester) in Britain about A. D. 60. How and when did the Apostle Paul become acquainted with them? Our Lord instructed his apostles when rejected by the house of Judah, to go to the "lost sheep" of the "house of Israel," and accordingly we find that after the day of Pentecost, the twelve separated, never to be reunited in this world; and instead of preaching to the people most contiguous to the Holy Land, they penetrated into far distant and separated countries—*e. g.*, St. Thomas journeyed to the extreme confines of India, and converted the people still called after him, viz: the "Christians of St. Thomas" on the coast of Malabar. Following up we may reasonably conclude, a remnant of the "escaped" of Israel who had gone east, when the main body went off west, as recorded in II Esdras xiii, 40-46, and I Maccabees xii.

And would the great apostle forget those "lost sheep" in the West, scattered among the nomad tribes of Celtic Gentiles, to whom he was expressly sent? No; we read that his journeys always tended in a westerly direction, and we have it expressly recorded by Clemens Romanus, his friend and fellow laborer, that he visited not only Gaul and Spain, but the **UTTERMOST** parts of the west; for allowing (which no one doubts) that he journeyed to Gaul and Spain, there was a country still further west which, alone, could be the "uttermost;" and if Great Britain is not expressly mentioned, considering the long previous colonization of Cornwall, Devonshire, and Ireland, by Greek Phœnicians, it would be highly improbable that St. Paul made Spain the end of his travels, even if persistent tradition and isolated remarks in Roman authors did not affirm the contrary.

Eusebius asserts that the apostles "planted Christianity in Britain, and passed the ocean to the British Isles." Baronius, on the authority of an ancient Vatican manuscript, "that the gospel was preached there by Simon Zelotes and Joseph of Arimathea, A. D.

35, and that the latter died there." Callistus makes the same assertion. Derotheus, Bishop of Tyre, records the landing in Britain of Simon; that he was slain and buried there, and (note this) that Aristobulus (mentioned in St. Paul's Epistle to Romans) was ordained first bishop at a time when we know from the Welsh ode, translated by Lord Aberdare—

" His country's stay, the valiant and the sage,
Was Bran-Ap-Llyr, the eagle of his age."

And the Welsh triads tell us, moreover, that "Bran, the blessed, first introduced the Christian teachers," and that on his return from Rome—where he was seven years a hostage for his son Caradoc, or Caractacus—"He was accompanied by Arwystlihen (Aristobulus the aged) a man of Italy," whom the Silurian Pedigrees of saints describe as being "the chaplain or confessor of Bran." William of Malmesbury agrees with the Vatican manuscript about Joseph of Arimathea, but gives his arrival as sent by St. Philip A. D. 61.

Lippomanus asserts that St. Peter preached to the Britons, for he carried (says Nicephorus) "the doctrine to the Western ocean and the British Isles."

Irenaeus (2nd century) speaks of Christianity as propagated to the utmost bounds of the earth by the apostles, and specifies churches in Spain and "among the Celtic nations"—*i. e.* Gaul and Britain.

Tertullian (2nd and 3rd centuries) states that Christ reigns over Britain, which the arms of the Romans had not yet subdued. "St. Jerome" (4th century) says St. Paul, "after his imprisonment, having been in Spain, went from ocean to ocean, and preached in the western parts." We know that Bran was sent to Rome as hostage in A. D. 51, remained seven years and was converted there, and released by the imperial edict in A. D. 58, and moreover, that St. Paul was sent to Rome as a prisoner in A. D. 56; was on parole "in his own hired house" for two years, and was consequently, by the same edict, released at the same time as Bran, A. D. 58, so that Paul, of Judah, and our Cymric hero Bran, both Christians, were both set free in Rome together, and that Aristobulus, another Italian Christian mentioned by St. Paul in his Epistles, accompanied Bran back to Britain as his chaplain.

Here is a glimpse of the first beginnings of Christianity among our Celtic ancestors, which cannot fail to be interesting to those who can understand that the mission of the apostles to lands as far apart as Malabar in India, and the Celtic colonies in Britain, was not the result of accident or chance, but a part of that great drama which, beginning with the "casting out" of the ten-tribed house from Samaria to Media B. C. 700, will, under the never slumbering eye of the Shepherd of Israel, go yet beyond our own times, until the "house of Judah" shall walk to the "house of Israel," and they shall go together to their own land, never again to be rooted up.

We shall in our next chapter endeavor to prove that Pudens and Claudia, when the term of military service in Britain was completed, resided at Rome, and were the patrons and protectors of both Roman and British Christianity.

It is not improbable that the (still existing) streets of Roman Chichester may have been trod by Aristobulus and St. Paul during the residence of Pudens and Claudia in that city. It is almost *certain* that they were also visited by the future destroyer of Jerusalem, after Aulus Plautius, with his German Auxiliaries and his elephants (the bones of one of which were found near Battle Bridge) had subdued the Regni, he was succeeded by Vespasian, who fought many battles with the natives, took twenty towns and the Isle of Wight. When Vesparsian was once surrounded by the Britains, his son Titus rushed to his rescue and extricated his revered parent, thus training himself in Britain for the awful task he was, as an instrument of Providence, to accomplish in punishing the House of Judah, by subjecting to the Roman arms, for a limited period, the "Lo-Ammi" outcasts of the Khumric or Cymric branch of the "House of Israel."

AN OPEN LETTER TO THE PRESIDENT OF THE UNITED STATES.

At a special meeting of the New York & New Jersey Branch of the International Institute, the following resolutions were unanimously passed, and a Committee appointed which drew up and signed the following open letter :

WHEREAS, The Ohio Branch of the "International Institute for Preserving and Perfecting the Anglo-Saxon Weights and Measures" is at this moment in special session at Cleveland, Ohio, considering the subject of the Standard Time, and whereas this subject, in October, is to come up, together with other equally important topics, before an International Congress to be convened at Washington,

Resolved, That the New York and New Jersey Branch of this Institute extends its sympathy and interest to the Ohio Branch, and pledges its best efforts to bring the objects of our society into public notice. In furtherance thereof, and in view of many contingencies with which this subject is surrounded,

Resolved, That an open letter be addressed to his Excellency, the President of the United States, asking that the conservative element in favor of retaining and perfecting our national weights and measures, be accorded a due representation in the coming International Congress which is to convene at Washington, D. C., upon October 1st, 1884.

Resolved, That a Committee be appointed by the President with power to act and to draw up such a letter, setting forth the urgency of the occasion, and calling attention to the danger which threatens our institutions.

Resolved, That said Committee sign the document in behalf of the New York and New Jersey Branch of the International Institute, and that it be duly forwarded through the President of the Branch to his Excellency, the President of the United States, and that they furnish copies thereof to the Press, with the request that it be kindly favored with an early publication.

NEW YORK AND NEW JERSEY BRANCH OF THE INTERNATIONAL
INSTITUTE FOR PRESERVING AND PERFECTING ANGLO-SAXON
WEIGHTS AND MEASURES. }
ROOM No. 24, COOPER UNION,
NEW YORK CITY, July 30th, 1884. }

TO THE PRESIDENT OF THE UNITED STATES OF AMERICA, CHESTER A. ARTHUR,
EXECUTIVE MANSION, WASHINGTON, D. C. :

Mr. President : In October, 1883, an International Congress was appointed by the several countries represented to decide upon a Standard or Prime Meridian, and met at Rome.

The Anglo-Saxon representation strongly urged the adoption of the long established and universally known English and American lines.

A disposition to accept such lines was manifested by the Latin representation, provided the English and American delegations accepted and endorsed the French Metric System of Weights and Measures.

This Congress arrived at no definite conclusion, but adjourned to reassemble with somewhat changed personality, perhaps, at Washington in the coming October (1884). Although the American Convention is an entirely original one, convened by yourself, at the suggestion of a Resolution of the United States Congress, it will thus, nevertheless, necessarily have the nature of an adjourned meeting of that held last year.

It is now distinctly and popularly believed that this Congress is not only to arrange for the one or several meridians above alluded to, but under cover of such authority is expected by the Latin nations to commit this nation to the acceptance, or at least the endorsement, of the system of weights and measures by which the English speaking peoples must in future be governed.

This convention will thus, unquestionably, have to consider and pronounce upon subjects of the very greatest importance to the masses, and which were not originally contemplated by Congress as belonging to the report to be made.

We, therefore, representing the large majority who are anxious to preserve and perfect the Anglo-Saxon System of Measurements, and who are convinced that while you have already selected delegates to represent the country in this Convention, on account of their high scientific ability, and as those who would best support our own interests and desires in the mere selection of a Prime Meridian, and yet certain that the Convention will have to consider, report upon, and at least partially commit the nation in other and far more extended directions, do respectfully submit to you the accompanying arguments in favor of the retention, with improvements, of our own ancient and popular system of weights and measures, and as forming part of this communication, request their careful consideration.

We also earnestly request that if any or all of those whom you have chosen to represent the nation in the said Congress are already committed to, or partially favor, the adoption of any foreign system of weights and measures, that at least the very great mass favoring the conservation and perfection of the Anglo-Saxon systems shall be equally represented.

We have the honor to be, sir,

Your most obedient servants,

STEPHEN M. CHESTER, C.E.

President of the Committee.

MEMBERS OF THE COMMITTEE.

FRANK H. NORTON,	E. HAZZARD SWINNEY.
B. S. CHURCH, C.E.	JOHN R. MOORE, C.E.
GEO. HENRY FELT, C.E.	ASAHEL ABBOTT.
C. V. SIDELL, C.E.	CHARLES E. MAXWELL.
SAMUEL MCELROY, C.E.	CHARLES D. CHAPMAN.
CHAS. K. GRAHAM, C.E.	COOK TALCOTT, C.E.
A. V. BENOIT.	JAMES KITCHEN.
J. H. STILLING.	C. W. HAVEMEYER.
CHAS. W. CARPENTER.	GEORGE KELLOGG, C. E.
J. N. WING,	WM. K. McALLISTER.
A. B. PAINE.	E. NEHAB, S. T. D.
FRANK H. FIELD.	P. H. DUDLEY, C.E.

Respectfully forwarded to his Excellency the President of the United States of America.
By direction of the Institute.

THOS. F. ROWLAND,

President N. Y. and N. J. Branch.

ARGUMENT BY COMMITTEE.

ROOM 24 COOPER UNION,
NEW YORK CITY, July 30, 1884. }

TO THE PRESIDENT OF THE UNITED STATES OF AMERICA, CHESTER A. ARTHUR,
EXECUTIVE MANSION, WASHINGTON, D. C. :

Mr. President: We have the honor most respectfully to invite your attention to a matter which we cannot but feel has never been presented to you in the light of its true national importance.

A consideration of what we have to submit is, however, so urgently needed at this juncture, that we trust the employment of a somewhat irregular method of bringing it to your attention will be pardoned.

As the Executive of so great a people, we are convinced that every subject which concerns the permanence of our institutions is sacred to you.

One of them is so seriously threatened at this moment, that we cannot resist the impulse to carry it directly to your consideration.

We refer to a matter which is certain to come up before the International Convention that will convene at Washington, D. C., upon October 1, 1884, and to which you have already appointed three delegates to represent our own country.

The ostensible object of this Congress of Nations is to decide upon a Standard, or Prime Meridian, from which hereafter the world is to estimate Longitude, Time, etc., etc.

Though called by you at the suggestion of a Resolution of Congress, and thus a measure of purely American origin, it will necessarily have the character of an adjourned meeting of the International Geographical Convention which convened last October at Rome.

The latter Convention, after having duly considered the several advantages offered by each of the proposed meridians, recognized the claims of that of Greenwich—an Anglo-Saxon one—and recommended its adoption. It is for the purpose of reconsidering this whole topic, and definitely fixing the selection, that the coming Convention is to meet.

But there was an important resolution passed at this Roman Convention which should not be allowed to escape your notice.

In conceding the location of the Prime Meridian for all time and people at the centre of an Anglo-Saxon civilization, other nations have undoubtedly put their own national prides into the background.

But they have not taken this step unwittingly, nor without a proviso which merits careful attention from the delegation who are to represent American and still more widely Anglo-Saxon institutions.

It is a well-known fact, and a noticeable one, that in every International Convention of the past the representatives of Anglo-Saxon people have always occupied and maintained a conservative position.

"We dwell alone," as it were, upon many international principles which other nations have long since abandoned. It is a race-characteristic of the English people so to do, and it is one, whether to be fostered or not, that should always be allowed a due weight in the representation of this country at International Conventions.

Now it was significantly resolved at this same Roman Convention that, in view of the concession of the Latin nations, above noted, the Anglo-Saxon world, and particularly the United States of America, should recede from their conservative position upon the question of Weights and Measures, and in return adopt the French metre, and come into the International Congress of Metrology.

Twenty of the thirty nations which will probably send delegates to Washington are already metric nations. The Convention will thus be overwhelmingly metric, and will naturally lean toward passing not only similar resolutions, but toward making them perhaps in the form of deliberate provisos.

If we mistake not, our own delegation has pronounced tendencies in the same direction. President F. A. P. Barnard, LL.D., S.T.D.—its chairman—is and has been for years the prime mover in all efforts to force the metric system upon our people.

Hitherto these efforts have failed. They have not been the result of any popular movement of which either the American Metric Bureau or President Barnard have been exponents. They have rather been the effort of a small minority of self-appointed reformers who would begin with an universal iconoclasm of all that is either good or bad in our native metrology.

In appointing additional delegates to this Convention, therefore, may we respectfully

request you to recognize the conservative Anglo-Saxon side of the several subjects involved. We feel that there should be among those who are to represent America in this Convention at least one delegate who is known to be an earnest advocate for the preservation and rectification of Anglo-Saxon Metrology.

No less of a statesman than John Quincy Adams has warned us in sound and ringing words against the metric system.

No less of an astronomer than the Elder Herschel has thrust the sword of Scientific logic through the living principle of the French Metrology.

So practical a manufacturing establishment as that of Coleman Sellers, after twenty years of fair trial, has pronounced this system inconvenient, cumbersome and unreliable, and at great expense has abandoned a costly plant, and returned to one founded upon a standard which may be conveniently subdivided into common fractional parts in terms of unit inches.

An American Society of no less standing than that of the "Mechanical Engineers" has pronounced against this system by a vote so enormous as to almost represent the popular sentiment upon this subject.

In the meantime the people have made no complaints against the ancient weights and measures. They have found them always equal to the demands of what with the spread of Anglo-Saxon civilization over the globe, has actually now become an universal commerce. The commerce of the world, its industry, and its wealth are predominantly Anglo-Saxon, and are transacted in pints and pounds and inches. The entire business of all those nations which are now metric sinks into insignificance when compared with that of the English-speaking peoples taken collectively. Anglo-Saxon Metrology is in fact the *de facto* international or universal system of the world to-day.

There are but a few thousand scientific gentlemen in our country who are upon the metric side of this question. They are mostly men who are not engaged at all in *practical* affairs. Though many of them are leaders in the several professions, they are not men who labor at the bench, the forge, or at the plow.

In no sense of the word do they or can they represent the popular desires upon this subject. That it is a subject in which every individual citizen—man, woman and child—is deeply concerned cannot be doubted.

It took France (the mother of this system, a small part only of which has survived) forty years with compulsion at the helm to ride the sea of confusion which followed its introduction.

The expense which its introduction would entail upon this country is incalculable, the discomfort and inconvenience beyond conception.

It is a foreign system. The *people* have not asked for it. They have given no demonstration which shows they desire so radical a change. There are no advantages to result from this change. There are many disadvantages. It is linked to no traditions of our race. That it is modern is no argument in its favor, unless it is better than what we now use.

But it is not much better. For it originated in the mistaken idea that all meridians of the earth are equal. They are not so. It was miscalculated in length, as well as in manufacture, and therefore cannot be recovered if lost. It is thus as purely *arbitrary* as its advocates would have us believe our own standard to be. It claims to be founded upon cosmic principles, but it is in fact far less earth commensurable than our time-honored English inch. The latter can be recovered with greater accuracy than could the "Standard Metric Bar" now stowed away at Paris.

Metrology is a vast and growing question in political economy. It had far better be allowed to work out its own destiny in the market and the workshop than be allowed to depend for its development upon the mere theories of those who *persistently ignore the very history of the metre in foreign countries.*

The decimal feature of the metric system is not one of universal advantage. This has been often shown, while, if it was, our own system admits of equally convenient decimal manipulation, both upward and downward, from the inch and the ounce, or from the foot and pound as units.

We will not attempt here to go over the arguments for and against the effort to *preserve and perfect our own system*, but take pleasure in submitting them herewith in another form.

We cannot allow a few mistaken, self-appointed, and unpractical men to commit our nation to a step which in our eyes would be like bartering our birthright for a mess of metric pottage, without making an honest effort to point out to what dire results the step will lead.

The publications of the International Institute are already quite voluminous. They consist of papers by many able men, and treat of the origin, the history, the preservation, and the perfection of our own system. Some of them at least are worthy of deep consideration at the bar of the nation's judgment.

They are at present in the form of suggestions even before our own Institute. It is as yet committed to no particular method of rectification, but is earnestly studying all that are submitted to it, and desires all fellow-citizens to examine with equal earnestness so great and serious a question.

This Institute enrolls among its members many earnest and able men, who may perhaps show our people good reasons for still maintaining their conservative position upon this matter.

The lamented President Garfield, your Excellency's predecessor, was its first elected president, and was a man devoted to its aims.

We submit herewith a list of our members, among which you will find the names of many well known to their countrymen, and would say in addition that numberless others are in sympathy with our object, though not yet enrolled in our comparatively young society.

Very respectfully,

For the Committee,

STEPHEN M. CHESTER, C.E.

CONSTANTS.

[TAKEN FROM VEGA'S LOGARITHMIC TABLES.]

		LOG.
Base of Napierian logarithms,	$E = 2.7182818$	0.4342945
Log E = Modulus of common logarithms, M	$= 0.4342945$	9.6377843 — 10.
Radius reduced to seconds,	206264.8	5.3144251
" " " minutes,	3437.7468	3.5362739
" " " degrees,	57.29578	1.7581226
360 degrees expressed in seconds,	1296000.	6.1126050
" " " minutes,	21600.	4.3344538
" " " degrees,	360.	2.5593025
Diameter π , circumference,	$\pi = 3.14159265$	0.4971499
	$\frac{1}{\pi} = 0.3183099$	9.5028501 — 10
	$\pi^2 = 9.8696044$	0.9942997
	$\frac{1}{\pi^2} = 1.7724539$	0.2485749
	$\sqrt[3]{\frac{1}{\pi}} =$	9.9063329 — 10.

DIMENSIONS OF THE EARTH.

[ACCORDING TO BESSEL, TAKEN FROM VEGA'S TABLES.]

		LOG.
Semi-axis major.....	$a = 3272077.14$ toises	6.5148235
" " minor.....	$b = 3261139.33$ " "	6.5133694
a in English feet.....	$= 20923597$	7.3206363
b " " ".....	$= 20853054$	7.3191822
a " " miles.....	$= 3962.8025$	3.5980024
b " " ".....	$= 3949.5557$	3.5965582
Ellipticity of meridian.....	$= \frac{a-b}{a} = \frac{1}{299.1528}$	7.5241069 — 10.
Excentricity of meridian.. $\sqrt{\frac{a^2 - b^2}{a^2}} = 0.08169683 = \frac{1}{12.24038}$		8.9122052 — 10.

LENGTH OF DEGREES OF LATITUDE IN FEET.

0° — 362,734	50° — 364,862
10° — 362,843	60° — 365,454
20° — 363,158	70° — 365,937
30° — 363,641	80° — 366,252
40° — 364,233	90° — 366,361

LENGTH OF POLAR AXIS BY VARIOUS AUTHORITIES.

(Clarke).....	41,707,796 feet.
Russian.....	41,711,019 feet.
Indian.....	41,712,534 feet.
French.....	41,697,496 feet.

MASSES OF THE PLANETS, THE SUN'S MASS BEING = 1.

TAKEN FROM VEGA'S TABLES.

Mercury = $\frac{1}{4865751}$ (Encke)	Jupiter = $\frac{1}{1047.879}$ (Bessel)
Venus = $\frac{1}{390000}$ (Le Verrier)	Saturn = $\frac{1}{3501.6}$ (Bessel)
Earth = $\frac{1}{354936}$ (Le Verrier)	Uranus = $\frac{1}{24905}$ (Lamont)
Mars = $\frac{1}{2680637}$ (Burckhardt)	Neptune = $\frac{1}{18780}$ (Peirce)
Moon = $\frac{1}{79.667}$ of the mass of the earth (Hansen).	

FURNISHED BY PROF. STOCKWELL.

Mass of Mars determined from the motions of its satellites by Hall, $\frac{1}{3093500}$

DENSITY OF THE EARTH.

Col. James, at Arthur's Seat, Edinburgh,.....	5.316
Carlini and Plano, at Mount Cenis,	4.950
Prof. Airy, England,.....	6.565
Cavendish,	5.480
Reich of Freiberg,.....	5.438
Reich of Freiberg,.....	5.882
Francis Baily,.....	5.660

MISCELLANEOUS.

TAKEN FROM VEGA'S TABLES.

Horizontal equatorial parallax of the sun (Encke) 8".57116 Log. 0.9330396	
Distance of the earth from the sun = 95,464,768 English miles 7.9793886	
Year according to { sidereal	365.2563582 mean days 2.5625978
Hansen and Olufsson { tropical	365.2422008 mean days 2.5625209
Precession according to Bessel = 50".21120 + 0.0002442926 t (epoch 1750)	
Precession according to Struve = 50".2298 + 0.000226 t (epoch 1750)	
Equatorial { (Bessel) m = 46".02824 + 0".000308645 t	n = 20".06442 - 0".0000970204 t
precession { (Struve) m = 46".0481 + 0".000284 t	n = 20".0650 - 0".000086 t
Diurnal precession = 0".13759 (1856).	
Aberration according to Delambre = 20".255	
" " Struve = 20".4451	
Nutation " v. Lindenau = 8".97707	
" " Peters = 9".2231	
Obliquity of the { according to Struve (1750) 23° 28' 17".44	
ecliptic { and Peters (1800) 23° 27' 54".22 — 0.4645 t	
Light is propagated from { according to Delambre in 493s. 198 2.6930213	
the sun to the earth { according to Struve in 497.827 2.6970785	
Velocity of light { according to Delambre 193360.0 English miles 5.2863666	
per second { according to Struve 191562.0 English miles 5.2823094	
Attraction of the sun { K in parts of the radius 0.0172021 8.2355814 — 10	
according to Gauss { K in seconds of arc 3548.18761 3.5500066	

MEAN VALUES.

FURNISHED BY PROF. STOCKWELL.

Tropical year, 1850, in mean solar days,.....	365.242213655
Annual variation of tropical year,.....	0.000000669

Maximum length of tropical year,.....	365.242783910
Minimum length of tropical year,.....	365.241529283
Length of a lunation in 1850,.....	29.530588572
Maximum length of a lunation,.....	29.53153417
Minimum length of a lunation,.....	29.53053100

NOTE.—The figure and magnitude of the earth are easily deduced from two measured arcs of a meridian at different latitudes, the most favorable case being where one arc is situated at the equator and the other as nearly as possible to the pole.

RECENT DETERMINATIONS OF THE PARALLAX OF THE SUN.

FROM TRANSIT OF VENUS IN 1874.

1875 Pinseux,	8".879
1877 Lindsay and Gill,.....	8".765 or 8".815
1877 Airy,	8".760 or 8".754
1878 Stone,	8".884
1878 Tupman,.....	8".813

FROM TRANSIT OF VENUS 1882.

Hongean, Royal Observatory of Brussels,.....	8".878
--	--------

A LETTER TO COL. INGERSOLL.

66 WEST 4TH ST., NEW YORK, MAY 24, 1884.

HON. ROBERT G. INGERSOLL :

Dear Sir: I see in the *Truth Seeker* of New York (Saturday, April 26, 1884), 'A New Lecture by Col. Ingersoll.'

In the third paragraph you say: "There was a time when the astrologer sought to read in the stars the fate of men and nations. The astrologer has faded from the world, but the astronomer has taken his place."

I cannot believe that you, having always been an advocate of reason, freedom of thought and speech, and justice, would intentionally make a misstatement, or, having done so, would hesitate to retract it were you shown to be in error. I wish, therefore, to ask you, Are these your words, and where is your authority for saying the "astrologer has faded from the world," or do you of your own knowledge know it to be so?

You will excuse me for troubling you, but I am very much interested in such matters, and I think if you examine into the subject you will find that astrologers have not all faded from the world. It is true that they are not as common as they were centuries ago, but that is not for the reason that astrology has lost any of the truths it has always contained, but because of the bigoted theological element in the world which has endeavored to carry out the words of God in the Bible who is said to have told the children of Israel, "Thou shalt not suffer a witch to live," and the so-called civilized nations of late years have done everything possible to exterminate astrology, knowing not the difference between it and witchcraft.

When the persecutions of astrologers have ceased, and the time comes when men will not be reviled, proscribed, or condemned for their belief in subjects that they have been compelled to admit to be true by rational and unbiased investigation, then you will find that the astrologer has not faded from the earth. You state, "The astronomer has taken his place." This is the first intimation I have ever had that astronomers have ever attempted to read the fate of men and nations. You speak of the great discovery in astronomy by Kepler, from which we may almost date the "birth of science." Are you aware that Kepler made equally as important discoveries in astrology? And "Kepler's Aspects," which he first discovered, will be known by his name equally as long as his first, second and third laws in astronomy.

Is it not strange that the ancients, who excelled in poetry, sculpture, mathematics, architecture, and also in astrology, putting it to the test every day for thousands of years, never discovered the falsity of it; while, in these days when very few persons know anything of the subject, every ignorant person supposes that astrology has been "exploded?" Probably you were not aware that for thousands of years all the calculations in astronomy were made for the sole and only use of astrologers, similar to the astronomical calculations of the present day being made almost solely for the purpose of navigation. The only person I have ever read, or heard tell of, that ever attempted, systematically, to explode astrology, was Bishop Butler, author of 'Analogy of Religions.' He wrote a number of articles against astrology, but finding he was so ignorant of the subject, it occurred to him that he could write against it with more advantage if he only understood the science. He began its study and ended up by writing one of the best works we have on the science, called 'Butler's Astrology.' Why has not his 'Astrology' been used as a text book in our universities, like his 'Analogy of Religions?' Simply because astrology is not fashionable in our day.

Yours respectfully,

L. D. BROUGHTON, M. D.

LETTERS.

LETTER FROM F. A. R. WINTER.

DEMERARA, June 4th, 1884.

'CHARLES LATIMER, ESQ.,

Dear Sir :—I have had the pleasure to own receipt of Miss Sanford's favor with documents and map and first number of the second volume of the STANDARD, and have now to acknowledge the second of May number. Enclosed you will please find three dollars for the cost of first volume of STANDARD, which you will oblige by forwarding. Would you kindly let me know the cost of a Pyramid thermometer and Fahrenheit combined? The STANDARD is a most interesting magazine to me, for I have for years blindly endeavored to fathom the mystery of the chronology of the Pyramid measures. The last numbers are especially acceptable, as I have now in Mr. Banks' hands a short paper on the correlation of Bible chronology with Pyramid measures, and I was in hopes of being in a position to send copies of it to you by this vessel, but am disappointed, not having heard from the gentleman who kindly took charge of my paper. I sent him corrected proofs quite in time to have heard ere this. My view is that the Bible chronology is in solar years as a thorough reckoning, but that there is a computation for short periods; that after Terah the shortened chronology is in calendar years, but going back from Terah to Peleg the intercalary years have to be added to the Bible record in calendar years; thus from Peleg to Shem the period embraced in the 215 inches or years of the doubled line of wall, the symbols here indicate not only a change of notation, but also a difference in length of year, for if we here double the intercalations and deal with the results as lunar years, we get the solar dates of the birth of Shem 2742 B. C., deluge 2628 B. C., in the double line of wall, thus accounting for all the specific measures in Our Inheritance from Exodus, 1542 B. C. Adding to this date for them 2742, 1656 — 114 = 1542 we get 4283 B. C. for Adam's creation—and I am pleased to see this strongly confirmed by Mr. Wood in his paper on the genealogical stones of the Pyramid, as well as by Mr. Reeves in his History of the Redemption. Mr. Wood's diagram on page 70, March number, gives the horizontal length of the ascending passage to the intersection with the descending passage as 3956 + but as this intersection is 215 + above the base line, we have a repetition of the 15 + concealed in the double line of wall. Now if the 215 + be produced in continuation of the descending passage at some angle, will it not increase the horizontal distance by about 204 inches, making the whole 4160? which is the date I bring out as the birth of Seth, the 126 years of Adam's period being merged in the measures in the passage to the subterranean chamber, and when this is added to 4160 we have 4286, a very close approximation to Mr. Reeves' deductions.

I fear this will be unintelligible to you in the absence of my paper, but in order to give you a clearer idea of my argument, I enclose some rough notes on the MS. sent to England with table. I got my 4809 from Hand book to the Bible, and I utilize it to show that the pre-Adamite measures are also to be found in this great record of Almighty foreknowledge. I am very strongly of opinion that using the π proportions in respect to these subterranean measures that they will be found to give the precessional period anterior to the first Pleiades year 2170 B. C., *e. g.*, the length from end of descending passage to entrance of subterranean chamber $\frac{224}{\pi} = 103 \times 5 = 515$. Breadth of sub-chamber

$\frac{324}{\pi} = 103 \times 100 = 10300 + 515 = 10815$ from south wall of sub-chamber to end of descending passage; from thence say at birth of Seth to Isaac 2170 B. C. is $1990 + 10815 = 12805$, or half the precession of the equinoxes = one diagonal of the Pyramid, or say $324 - 126 = 198$ pre-Adamite years in sub-passage. $198 \times \pi \times 5 = 3110$ — breadth of sub-chamber $\frac{324}{\pi} 103 \times 200 = 20,600 + 2116$ from creation of Adam to birth of Isaac 2170 B. C. or Pleiades year — $3110 + 20,600 \times 2116 = 25,846$, a full precession of the equinoxes. I am not a mathematician, but I am certain there is more in these approximations than appears on the surface. Cannot your more talented friends work out this idea? Wishing you success in your noble work, I am, my dear sir,

Yours in faith,

F. A. R. WINTER.

The following table shows that the thorough chronology of the Bible agrees with the Anno Sacro thorough record in solar years. It also shows that the Pyramid measures are in close accordance with both, and further, that as indicated by the symbology of the doubled line of wall at the entrance to the descending passage of the Pyramid, there is a dual reckoning all through, and that when the intercalations, suggested by the sign placed against the ages of the several patriarchs, are supplied, they give the true date. Thus we find 637 Bible years from Exodus to birth of Isaac; these reduced from calendar to solar years give 628, the number of inches marked in the Pyramid; and from Isaac to Peleg the Bible record is 357 years, while the Pyramid requires 357 inches. Now if we supply the intercalations indicated, at the rate of one year for each patriarch, say 11, we shall have 362 calendar years equal to 367, the number of Pyramid inches required; the intercalated years being the exact difference found in the record from Exodus to Isaac; proving the duality of the Bible record from Exodus to the dispersion. This brings us to the entrance of the descending passage in the Pyramid, and here the doubled line of wall not only symbolizes the dual chronology, but marks a change in the mode of reckoning. In Genesis V, we have a period from Peleg to Noah's 500th year of 200 years. The double line of wall is 215 inches long. Now if we take the 11 intercalated years and double them, we shall have 223. Dealing with them as *lunar* years, we find them equal to 215 solar. One hundred years from Peleg to the end of the flood, and 115 years to the birth of Shem, including the duration of the flood, covering the exact measure of the double line of wall, giving 2,628 as the date of the deluge, and 2,742 as that of the birth of Shem. Here we must note the peculiarity of the division in the number of the intercalated years before and after the flood; in the latter period we have seven following in unbroken notation; in the former we have *one*, separated from the remaining three. This was not done without intention, but with design and purpose. It appears certain that the three ember numbers were intended to be cut off from the reckonings at some portion of the record, leaving eight to be computed. Applying this to the section now in hand, if we double these eight and add them to Noah's 500 years, we shall have $516 = 501$ solar years; there are 321 years back to Enos, add to them 16 years and we have 837 as lunar years = 812 solar. There are yet 105 years to the birth of Seth, adding the three remaining intercalations and we get 108 as lunar years = 105 solar, leaving Adam's era only to be dealt with. And as this period is covered by the passage to the subterranean chamber, we deal with the 100 years as lunar years without any additions, and we get 126 solar years; deducting these from the 324 inches of the passage length, there remains 198 years, and as the breadth of the subterranean chamber is 325 inches, the pre-Adamite period is shown to be 523 years, the sum total being 4809 years.

One hand-book places the death of Herod the Great at 4806, and remarks that the nativity of our Lord is supposed to have taken place about this period, and begins the vulgar era at 4800.

Now if we take Noah's era at 1056 Bible years as calendar, they are equal to 1040 solar

years, and 1040 years is a soli-lunar cycle—at which period all the reckonings coincide, and this appears a most appropriate time for the appearance of Noah, or *rest*. Now the number of years from birth of Seth to Noah is 4160 = to four Daniel cycles of 1040 years each—six of these cycles will end in 1950—1885. It cannot fail to strike the eye of Pyramid students that $\frac{3628}{100} = 26.28$, the angle of the descending passage, and as the length of that passage is shown by Mr. Latimer to be 4125, we have the king's chamber multiplied by 10.

LETTER FROM C. PIAZZI SMITH.

KURN HATTIN, HAVSTOCK, WINCHESTER, June 19, 1884,

My Dear Mr. Latimer :—I lately sent you a pithy anti-French metrical quotation from a private letter, on the back of a post-card. From another letter by the same party I now quote as follows :

"At school we were taught the king's English, *i. e.*, miles, yards, furlongs, feet, etc. ; now, an unholy, Bialite, small sect, who think no small beer of themselves, try to force upon Englishmen such terms as centimetre, milligram, kilometre, *e. c.*, etc. All which terms convey *no meaning whatever* to an Englishman ; and the people won't have it. 'No, not for Joe,' meaning, I suppose, Joseph, of whom Ephraim came.

"It is high time for active resistance to be made against these as well as other abuses which are sought to be imposed upon us. It is not for us to judge men, but I cannot help noticing that the greater part of the men who advocate these changes are not God-fearing men. I believe that Satan is making a last stand, and using every means in his power to blind those who are within his reach.

"There are in fact and truth, very, very few people in England who care to have the false French measures, and they belong to one set only. I will give every support in my power to aid in resisting such a movement. Prayer is a great weapon in our hands, necessary, as we are fighting against principalities and powers ; but besides prayer we must use such other weapons as are available. A clergyman is not content only to pray for his people, he *works* among them. I do earnestly pray for and wish our good American cousins of the International Institute and INTERNATIONAL STANDARD every success."

Now who is the person who writes thus nobly, do you ask ? He is Mr. J. Leyland Feilden, of Proppynden, Burwash, Sussex, the author of a little book published a few years ago entitled, 'Israel's Jubilee,' and since then of a larger book entitled 'The Word, the World, the Branch,' wherein he sets forth a chronology indicating that the present year is in truth only 1880 A. D., and that the year 1882 of Israel's Jubilee is yet to come, and will be specially signalized ; and he has much to say with regard to the site of Jerusalem, and the plans and purposes of the Great Pyramid. Further, while of Scandinavian descent he is a thorough English gentleman, living at his place in the country, but occupying himself *con-amore* with many questions both in science and religion. To him, then, I had sent a copy of my little book dedicated to the International Institute, viz : the 'New measures of the Great Pyramid, etc.,' and he was so much taken with the account there given of the International Institute, that he said that he must send them a subscription of £5. I gave him an opportunity of second thoughts on the subject, but that has made no difference, for in his second letter he has actually enclosed a check for £5, which I propose to take into Winchester on Monday, get cashed, then converted into a post-office order, I sent to you as President of International Institute, Cleveland, Ohio, U. S. A.

On going home, which may be in nine days now, I must see if I have a spare copy of

any of Mr. L. Feildén's books to send you, and you may be sure that he will be glad to hear straight from you.

Yours truly,

C. PIAZZI SMITH

July 21, 1884.

P. S.—Alas ! Poor dear Abbe Moigno is dead, with all his fine aspirations for science with God, as against science without God ; and God the ruler of his own world, God in history and God in revelation.

C. P. S.

LETTER FROM F. HESS.

FORT DODGE, IOWA, August 8, 1884.

CHARLES LATIMER, President, Cleveland, Ohio.

Dear Sir : Your esteemed favors of the 18th and 19th ult., as well as your circular and a copy of 'New Measures of the Great Pyramid by a New Measurer,' reached here in due time, and would have received earlier attention but for a protracted absence from home and pressure of other business.

I shall take great pleasure in reading more carefully than I have so far been able to do Prof. C. Piazza Smyth's just and generous criticism of Mr. Petrie's work at Jeezeh, which, when rightly applied, so gloriously confirms the very theories it was designed to overthrow, and shows how the wrath of man is made to praise the Lord.

I too, am very thankful to Mr. Flinders Petrie for unwittingly bringing out into clearer light also the luni-solar character of the Great Pyramid, and I now believe more firmly than ever that the very discrepancies between the different measures of the base lines, arising from different levels of the corner sockets, were designed to show the inequalities of the moon's motions, and the different lengths of the seasons of the year, as well as of the great equinoxial cycle, and, perhaps, of those of the still greater cycle of the solstices from pole to pole, comprising at the present rate of decrease in the obliquity of the ecliptic a period of some 2,590,000 years, or ten equinoxial cycles, with its long ages of a world's winter and summer, spring and autumn.

This seems to me suggested by the present slight deviation of the base lines of the Great Pyramid from a true meridian and prime vertical.

I have neither the time nor the inclination just now to wrestle with hair-splitting fractions, which I must leave to our mathematicians, begging them to fully investigate this luni-solar character of the Great Pyramid in the light of Mr. Petrie's new measures and the following simple equations, viz. :

25 common years = 309 lunations.

7 common years = 365 weeks = one Sabbatical cycle.

7 Sabbatical cycles + one sacred year of 377 days = 618 lunations + 12 days = 50 years = one jubilee cycle, typical of the final restitution of all things.

10 jubilee cycles plus one day = 500 tropical years, the average length of which = 365.2420 days = the length of the tropical year A. D., 5,000, etc.

Let them compare these numbers with the different lengths of the base lines of the Pyramid, with the dimensions of the queen's chamber upon the 25th course of masonry, and of the king's chamber upon the 50th course of masonry, and see what additional new harmonies they may discover there, and say whether the combined wisdom of modern science and modern religion can suggest a better chronology for a *novus ordo seclorum* than the one so plainly flowing from this hoary Altar and Pillar of Jehovah at Jeezeh into all the world.

I should like to go further into details, but other more urgent duties claim my attention.

Some of our young men here manifest considerable interest in the work of the International Institute, and when I get a little more leisure I will send you another list of names. Those I have already sent you are not to be proposed for membership except at their own personal and direct request, upon renewal of their subscription to the INTERNATIONAL STANDARD for the coming year.

Very truly yours,

F. HESS.

LETTER FROM J. R. SKINNER.

110 BROADWAY, CINCINNATI, July 2, 1884.

My Dear Mr. Latimer : I received one copy of the Society's Magazine, and I want the second or duplicate copy, as I consider this the ablest and most important paper ever published on the Pyramid and its measures.

Now to the July number. I have been amazed. The combined effect of the several articles independently written caused such a feeling of gratification as I am unable to express. The convincing power of the combination seems irresistible, while, besides, there is a curious tendency toward coming together and agreement as to perplexities such as I have never yet seen, and which heretofore has seemed impossible, a rest from our weariness. Surely the Great Spirit is brooding providentially over the work.

(1) Comes P. Smyth with an astronomical value of great importance—viz., the tropical year of 365.24224. I have always held to this because Parker worked it from his ratio. Now Smyth confirms it by statement.

(2) In order, Dr. Redfield gets so hot as to his mention of Shechem, that if he but knew that which is supplementary to what he says he would get on fire with the discovery of an amazing matter.

Then (3) the two remarkable and telling papers of Mr. Dow, so well put and so unanswerable! Strange, however, when he finds such a use of the very terms of 648 : 206264.7 out of the form of 20612 : 6561 :: 648 : 206264.7 that he does not see the necessary connection. But his second paper is exquisite. Had I worked two years and discovered this relation, I should feel that I had found one more crown jewel. You wrote me about it, but I thought I would say nothing. But now please look at crown jewels at height from ground level, I believe, to intersection of floor line of grand gallery with vertical height, in inches diameter to 5184, as 1296×4 , 5184 being indication of 5184000", or 1 solar day of 24 hours, 5184 inches being 4 square yards of 1296 inches each. The top of this vertical height leads and connects with his development of same use in the totality of king's chamber. But this vertical height line is there seen to be connected with and in the area of 63360, or 5280×12 , whose base side is $\sqrt{63360}$, connecting Mr. Dow's development with the British inch, foot, yard and mile measure in this area, thus bringing in support and confirmation of Rev. Mr. Wood's researches.

(4th) And next in order your superb resumé and discussion of the bases of measuring calculation and various application. My friend, you may be proud indeed of that article. Surely, surely, there is a God in Israel.

Besides these I have to notice the singular and valuable article of Mr. Faber, and the conservative and sound paper of Prof. Stockwell.

Such work tells of a power which must be felt, and must have great convincing weight and influence wherever it goes and is read.

It is true man proposes, but here it seems as if God was laying hold of the matter and

was disposing. It is the cause of truth, wherefore we may rejoice in such leaders—strong in their strength.

Your friend,

J. R. SKINNER.

LETTER FROM PROFESSOR PIAZZI SMYTH.

KURN HATTIN, near Winchester, June 21, 1884.

My Dear Mr. Latimer: Your last enclosure with a reproduction of Mr. Osburn's portrait, and a commendable apology for Mr. Dow's hasty paper, have reached me here, where we have come for a few weeks; but you can still go on directing your letters to Edinburgh, where they are daily forwarded.

I had recently a long letter from Rev. Mr. Perry, and he communicated one from you to him, advising that I should be applied to for an idea of the expense to be incurred by the American expedition. I replied, if they do not yet know what they are going to do, how can I tell them what their unknown project will cost in doing? You must have a definite idea of all of what requires to be done, and then apply to some one more accustomed than I am to large works of co-operative schemes, and who knows Egypt as it is now.

One thing you have a firm conviction ought to be done, and ought to have been done long ago, viz: the connecting of Great Pyramid for longitude with the Venus Transit telegraph station of 1874 on the Mokattam hills. Make this the No. 1 of the programme of your coming expedition.

Next I would suggest, find out from F. Petrie's book something, probably a great deal, that should be checked by a new worker. He presumes greatly on his deduced or supposed limits of "probable error." But I never yet knew of any operation in applied science in which a second worker did not show that the first worker was three, six, or ten times more in error than what he had computed according to theory of probable errors.

You may perhaps be led to select some points of F. P.'s work, for this re-examination after you have seen my little book about it. The one hundred copies for the International Institute, through you, their president, are now sent off by the Smithsonian agent in London, to the Institution in Washington, to be forwarded to you in their parcel 14752, and that in case No. 635. For all that, however, I shall send off the first single copy, I hope to get next week, to you, per post, so that you may have an early look at it, in the above point of view.

I am expecting a visit from Egypt soon, from a Mr. James Hewat, son of a Mr. Hewat, late an Edinburgh citizen, whose scheme of the city having an electric fired time-gun, as well as an electric dropped time-ball, I took up and have maintained ever since as one of the duties of the Royal Observatory, Edinburgh.

Mr. James Hewat is an accountant, is delighted to hear of your probable visitation to him at Alexandria, Egypt; says he is the oldest British resident in Alexandria, dating years of residence there only, and will be delighted to give you and your party all the information and all the help in his power.

There is a Colonel A. T. Fraser, R. E., in Trichinepaly, Madras, superintending public works there, who writes to me every ten days or a fortnight on Pyramid and other such matters, and has done so ever since he passed through Egypt in 1881 and saw F. Petrie at work, and said, spite of the Vyse casing stones and pavement being within the line, that he thought the sockets at the corners looked more like what the ancient builder *intended* to make and be taken as the fiducial references for the size of the whole building.

I remain yours very truly,

PIAZZI SMYTH.

LETTER FROM JOSEPH BAXENDELL.

SOUTHPORT, January 25, 1884.

CHARLES LATIMER, ESQ., C. E.

My Dear Sir:—Your letter of the 8th instant enclosing copy of Mr. Wood's letter has just come to hand, but as I have not yet received a copy of this month's number of the Magazine I cannot offer any remarks on the criticisms of Mr. Petrie's measures, or the results of Mr. Wood upon the cycloid and British mile.

With respect to Mr. Wood's criticism of my equation for the moon's mean period, I observe he has commenced by applying the sign β' to $40 \text{ } 1' 2$ as well as to 36325.95983 in the denominator of the first member of the equation, which of course has led him to the "something wrong."

Mr. Wood says that "if in the formula $\frac{1'a}{d+d'} = \text{sine } 26^\circ 17', 26.47''$ we let $d =$ equatorial dia. and $d' =$ polar dia. we shall have $\frac{1'a}{d+d'} = \text{sine } 26^\circ 18' 10''$, which is nearer Professor Smyth's and his own "theoretical passage angle"; but the limiting value of the expression $\frac{1'a}{d+d'}$ is exactly $\text{sine } 26^\circ 18' 9.77''$, and, therefore, "the theoretical passage angle" cannot have reference to the figure or dimensions of the earth, as no one will admit that its form is that of a true sphere having its polar equal to its equatorial diameter.

On the next page I give you a few relations of pyramid measures and numbers which may, perhaps, interest you and some of the members of your Society; and, awaiting the arrival of this month's STANDARD, I remain,

Yours sincerely,

JOSEPH BAXENDELL.

RELATIONS OF PYRAMID MEASURES AND NUMBERS.

The square root of the length of a diagonal of the base of the Pyramid = 113.636552.
113.636552 miles = 200,000 yards.

The square root of 200,000 = 447.2135.

447.2135 divided by 3 = 149.07117 = mean height of ante-chamber.

447.2135 divided by 4 = 111.80337 = height of western granite wainscot of ante-chamber.

The height of the king's chamber, 230.38868, multiplied by the mean height of the ante-chamber, 149.0712 = 34.344 \times 1000.

The length of the grand gallery, 1881.6, multiplied by 50, and divided by the length of the great step 61 = 1542.295 = length of first ascending passage.

LETTER FROM L. F. HASKELL.

SAN FRANCISCO, August 6, 1884.

CHARLES LATIMER, ESQ.:

My Dear Sir: In reply to your favor of the 19th ult., and circular just received, I enclose one dollar to help on the good cause, and wish I were in a position to do much more for it.

I believe you are doing a good and great work, and I hope that no obstacles, however great, will discourage you. I admire your devotion and enthusiasm, and these are what accomplish results. I think you should feel greatly encouraged that the Institute can muster six hundred names as members already, but I hope this is only a beginning and that you may see the interest in it so general, that not only will the Magazine be amply supported, but when the time comes definite and right action may be had in perfecting

our system of weights and measures ; but we want to be sure that the action is right before it is taken. Do not be in a hurry about doing this. With very best wishes,

L. F. HASKELL.

LETTER FROM SARAH PLUMPTRE.

EWELME, WALLINGFORD, July 17, 1884.

Dear Mr. Latimer : I am deeply interested in your letter, and in the contents of the Magazine. I really seem to read it next to my Bible, and I only wish I could further the cause far more than I can. I try to interest every one I can, but many laugh at it, and few are able to grasp the subject and grapple with it. I know so few scientific men. Mr. Godwin, perhaps, I have helped to bring you, but he was interested in the subject as early as I was, from his love for and his appreciation of Mr. Taylor, and I think he first took the manuscript of 'The Great Pyramid' to Mr. Taylor's publisher.

If there is yet time, cannot steps be taken to make *well* known amongst scientific men the great struggle coming on at Washington, the need for all to take their part?

I hope the universal meridian will be the Great Pyramid.

If I may venture to make a remark, I would avoid if I were you letting the Magazine bear any political complexion. Doubtless most persons in America are Democrats, while most persons in England are, I hope, ardently attached to a constitutional monarchy. I know I am, and I would die any day for the dear queen.

I write hurriedly ; pray excuse it, and believe me,

Very sincerely yours,

SARAH PLUMPTRE.

LETTER FROM E. P. INGERSOLL.

ROSEVALE, CLAY CO., KANSAS, AUGUST 5, 1884.

CHARLES LATIMER, C. E. CLEVELAND, O.

My Dear Brother :—I thank you much for the little book of Prof. Smyth's 'New Measures,' etc., which came in company of the back numbers of the INTERNATIONAL STANDARD. How triumphantly Prof. Smyth has vindicated himself and all his great work touching the Great Pyramid. Yes, error can never stand the conflict with truth any more than darkness can with the blaze of light.

I am glad to learn that the plan of sending an exploration party to Egypt is likely to be accomplished. If I had the means I would defray the whole expense myself, rather than that the work should fail. I hope, therefore, we shall soon hear of the departure of this expedition, with you yourself at the head of it.

In love,

E. P. INGERSOLL.

EXTRACT OF LETTER FROM REV. W. COOKE, D. D., TO PIAZZI SMYTH.

LONDON, June 21, 1884.

I have read with grateful interest your work on the 'New Measures at the Great Pyramid,' and present my warmest thanks to the esteemed and gifted author. It is Christian in spirit and quite conclusive in argument, in reply to Mr. F. Petrie. Indeed Mr. Petrie's findings corroborate for the most part the bases of your argument, and if his mind were not perverted by foregone conclusions, the remarkable coincidences between his findings

and yours would have extorted from him an acknowledgement that the several commensurabilities, both externally and internally, between the Great Pyramid and the mathematical phenomena of the universe, were at least wonderful, and that *until* some other explanatory reason could be given for the scientific structure of the Pyramid, those which you assign should be regarded as worthy of the profoundest investigation by the most advanced philosophers of the day. For my own part Mr. Petrie's findings strengthen your scientific arguments.

I am glad to observe how you have kept your pen under restraint, even when there was just occasion for a degree of severity. All the better for your argument; for truth does not need ridicule, though error often deserves it.

You have done well to reprint the admirable paper of the Rev. H. G. Wood. Its logical, philosophical and mathematical arguments form an excellent appendix to your facts and your discoveries.

Accept my grateful thanks. You have indeed done great service to the cause of truth.

Yours most faithfully,

(Signed)

WILLIAM COOKE.

EXTRACT FROM LETTER OF REV. JEVONS J. M. PERRY, M. A., TO
PIAZZI SMYTH.

ST. PAUL'S VICARAGE, ALNWICK, NORTHUMBERLAND, JULY 2, 1884.

Let me thank you most sincerely for your charming little book on the Great Pyramid, which has interested me extremely, especially part iv, chapter 4. Our blessed Lord's return in glory is my hope and desire, as it ought to be of every Christian man; and if, among other astronomical marvels, the Great Pyramid gives us warning of the approach of that blessed day, we cannot but be thankful for its teachings.

COPY OF LETTER FROM REV. DR. MACKAY TO PIAZZI SMYTH.

VENTNOR, ISLE OF WIGHT, June 28th, 1884.

My Dear Prof. Smyth: Please accept of my warm thanks for the valuable little book you have just sent me—'New Measures of the Great Pyramid by a New Measurer.'

I am very glad to have it, for it has very greatly relieved my mind in regard to many things on which Mr. W. F. Petrie had thrown some doubt. Your reply, thank God, is really triumphant, more especially as supplemented by the Rev. Mr. Wood's admirable paper "on the present state of the base side length." In that paper he gives very cogent reasons for holding that the sockets, and not the pavement, are the all and in all of the Great Pyramid. I earnestly hope the Americans will soon put into execution the noble purpose announced at page 101. When this is done, the testimony of the Pyramid must be complete.

On most points Mr. Petrie has been met ably and honestly, and you have shown a noble spirit towards your subtle antagonist all throughout. You have emerged triumphantly from this last, and by far most skillfully planned attack that has ever been made on your great work; and my hope and prayer is that God may prolong your life to see the top-stone placed on your life labor. And I am yours, very faithfully,

(Signed)

ALEX. MACKAY.

LETTER FROM E. P. INGERSOLL.

ROSEVALE, KANSAS, August 12, 1884.

CHARLES LATIMER :

My Dear Brother : I use this term in more senses than one; in these two, at least : (1.) a brother in Christ; (2.) a brother in the pursuit of exact knowledge respecting the Pyramid. It is in this last sense I desire now to write.

I have found the July number of the INTERNATIONAL STANDARD, an exceedingly interesting one, because it deals in facts and established truths, all except Dr. Redfield's article. I have read his article with all the care I can bring to bear on the subject, and still I have to say, where is the evidence that Joseph ever had anything to do with the Great Pyramid? But especially, what shadow of evidence is there that Joseph's embalmed body ever lay in that wondrous coffer? Surely, the Scriptures make no allusion to the subject in that direction, and history—what does history say? If there is any such history where shall it be found but in Egypt? Who has ever seen that history?—let him speak. Again, what saith the Pyramid itself? Where is the entrance through which the bearers brought that sacred body? What does Dr. Redfield say? He *supposes*, if I have read correctly, that they must have entered by some subterranean passage, and thence ascended up the "well;" thence up the grand gallery till they reached the king's chamber. But how does this look to you, my dear brother? What is the evidence of it? Can we credit such a supposition without the first ray of evidence hitherto adduced? Especially when we encounter obstacles that throw all those met by infidels about the Bible utterly in the shade. By the doctor's theory they entered by a subterranean passage, in the solid rock, an hundred feet below the base!! Thence they ascended up that crooked, zig-zag, perpendicular "well-passage!!" And when they came to the ante-chamber, what then? Well, let the Doctor answer. So, also, in taking the "bones of Joseph" out of the Pyramid, how did they manage. Did they go out as they came in? Who can tell?

Now is this the ground we have to work upon, to prove the divine inspiration of the Pyramid, and of its wonderful structure throughout! If so, I utterly despair of ever seeing that thing accomplished. It seems to me that the reading of the article on "The Altar and Pillar to Jehovah" must repel every one, whose mind is already established. How the doctor could ever have got that idea into his head, I cannot conceive.

No, I think when we bring forward theories, or rather I should say hypotheses, which when worked out are found to rest on fancy only, we shall never get ahead, whatever else we may do. I have found, in advocating the cause of the Great Pyramid, and also the identity of the Anglo-Saxen with Israel, *facts, known facts*, which are founded on history and reason, are the only weapons I can use in this warfare against Satan and his hosts. For is not everything opposed to the truth originated by Satan? Is not he the father of lies? And he can be met by truth, by truth alone, and not by fancy.

Now, my brother, I have no fears as to the final result of this great controversy, no more than I have that God will die. The evidence is, to me, as clear that this Great Pyramid was built by divine inspiration, as that the Bible was divinely inspired. That the builder of the Pyramid, whoever he was, was inspired, as certainly as Moses was inspired to write the Pentateuch. For, in both cases, the work performed was beyond the powers of all human beings combined. Why should I doubt then? God promised that he would fulfil the covenant made with Abraham: that his seed should become like the sands of the sea for multitude; that kings should come out of his loins; that Israel should become a nation of great power and wealth, "lend to many and borrow of none." To Ephraim it was promised that he should become a multitude of nations; and Manasseh a great nation. These things, these promises, are now fulfilled up to the present time (especially the two last), so that the crossing of a "t," or the dotting of an "i," cannot be found wanting. And will not God—the same God—bring to light all truth con-

tained in the Pyramid? Indeed is He not now summoning His "witnesses" to testify before the world to the great truths imbedded in the great monument of stone?

E. P. INGERSOLL.

P. S.—I hope I may be permitted to meet with you at one of your fortnightly meetings ere long.

LETTER FROM EPH. M. EPSTEIN M. D.

VERMILLION, D. T., JUNE, 29, 1884.

My Dear Mr. Latimer:—I take the pleasure of replying to yours of the 17th inst., and begin by referring to the second part of your letter.

(1). The Ensign and Banner of the Common Version have in the Hebrew two terms: "Nai S" and "De Ge L."

"Nai S" occurs in the following passage:

Exod. xvii., 15, 16.—"And Moses built an altar and called his name Ja H Ve H of my Nai S;" (in Heb. "Ja H Ve H Ni Si J,") for he said: "For (the) hand is on the seat of Ja H, (the symbolic bodily attitude during an oath, compare Genes. xxiv., 2), there is war unto Ja H Veh against Amalek from generation of generation."

Numb. xxi., 8, 9.—"And Ja H Ve H said unto Moses: Make thee a Se Ra F, and put him upon a Nai S; and it shall come to pass, that every one who is bitten, and should see him, and should live. And Moses made a serpent of copper, and put him upon the 'Nai S.'" (I suppose this Nai S, flag, was the most notable one in front of the chief commanders tent.)

Numb. xxvi., 10, 11.—"And the earth opened her mouth and swallowed them up, and Korah also, in the dying of the congregation, when the fire consumed the 250 men; and they were for a Nai S—(an outstanding miracle). But the sons of Korah died not"—(a singular escape).

Ps lx., 6.—"Thou hast given to Thy fearing ones, a Nai S—(flag—banner—ensign) to rally themselves together, because of separation."

Isaiah v., 26.—"And he shall lift up a Nai S to the nations. (i. e., give a signal to all but only one will act upon it), and he will speak unto him, and behold, quickly, lightly he will come."

Isaiah xi., 10.—"And it shall come to pass in that day, that the root of Ishai, which stands for a Nai S of (the) Nations, unto him shall the nations inquire, and his repose shall be glory."

Ibid. 12.—"And I will lift up the Nai S unto the nations, and gather the cast-away-ones of Israel, and the scattered ones of Judah he will pick up from the four skirts of the earth."

(In the above three passages the prophet speaks of what we would call "An International Banner," or a "Nations' Banner.")

Isaiah xiii., 2.—"Upon the evening mountain lift ye up a Nai S. Raise ye a voice unto them, wave ye a hand, and let them come into the doors of the generous ones, (i. e., noble in actions)."

Isaiah xviii., 3.—"All ye settlers of the world and dwellers of earth, ye shall see when the Nai S of the mountain will be lifted up, and when the horn-trumpet shall peal ye shall hear."

(But you and the whole chapter deserve that I should translate the whole of it, adding brief remarks. (1). "Ho, land buzzing with wings!" (i. e., where there is an unusual amount of insects and birds, compared with other lands) where there is an unusual amount of quadrupeds and reptiles, "which is situated from opposite to the streams of

Cush!"—(Africa, *i. e.*, the southern part of the American continent). (2). O thou sender of forerunners in the sea, and with vessels of rushes, (*i. e.*, light boats) upon the faces of waters!" (Spanish early explorers of America.) "Go, ye swift messengers to a people pulled apart and plucked, (the Indians), to a folk terrible, (but) from now and onward a people of streak and streak, and trodden down, whose land adventurers have despoiled." (The So-American Indians). (3). "All ye settlers of the world and dwellers of earth when the Nai S of the mountains shall be lifted up, (then) ye shall see, and when the horn-trumpet shall peal, (then) shall ye hear. (4). For thus saith Ja H Ve H to me; I will be quiet, and will look at it in my habitation; as (in) pure warmth by (genial) light, as (in) a cloud of dew in the heat of the cutting time—(vintage). (5). For before the cutting time, when the blossom had completed, and the ripening grape had had her flower, and the pruner had removed (and) cast aside the useless and cast off (branches) with cut-shears, (6). they (indeed) together shall be abandoned to the hawk of the mountains, and to cattle of the land; and the hawk shall disgust himself upon it, and all the cattle of the land shall defile itself upon it." (*i. e.*, when the worldly people shall have had their disgusting fill upon the useless, cut off members of American society outside of the people of the Lord). (7). "At that time there shall be carried a present unto Ja H Ve H of Hosts, a people (also) pulled apart and plucked, and (some) from (that) people terrible, (but) from that time and onward a nation of streak and streak, whose land adventurers have despoiled unto the place of the name of Ja H Ve H of hosts, (even) Mount Zion." (*i. e.*, the return of Israel and Judah to the Lord and to Zion takes place after the discovery and Christianization of America. My friend, there is neither fancy nor forcing in this interpretation and translation. Simple history is my faithful interpreting guide).

Isaiah xxx: 17. "One thousand before the threat of one, before the threats of five ye shall flee, until that ye shall remain like a mast upon the mountain top, and as a Nai S upon the height."

Isaiah xxxiii: 23. Thy sailors (rope handlers, from "sail" a rope, in German), have forsaken (thee), they will not fasten properly their mast, they have not unfurled a Nai S (flag); then was the great booty divided, until the (very) lame ones robbed spoil."

Isaiah xlii: 22. "Thus saith the Lord JaHVeH, Behold I will bear up my hand unto the nations, and unto the folks my Nai S and they shall bring thy sons in (their) skirt, and thy daughters upon the shoulder shall be carried" (*i. e.* in sedan chairs, compare Numbers vii: ix, with Numbers iv: 10–12, and xiii, 23).

Isaiah lxii: 10. "Pass ye, pass ye, through the gates! Clear ye (*i. e.* who are inside of Zion), the road of the people! Cast ye up! Cast ye up the upward causeway! Clear it out of stone! Lift up a NaiS unto the folks!" (*i. e.* the different returning families).

You will notice that the consonants of NaiS are the same as are *sounded* in the word "sign," only they are read transposed. The letter "g" is likely more primitive than its omission in the Hebrew.

The word "ancient" is derived from "anteannus"—former year; the *t* before the *e* becoming softened into an S sound, ancient—antient. It has nothing to do with "en-sign," which is from the Latin "insigno," where the "in" has the meaning of instrumentality, whereby a thing is done. The Hebrew for "ancient of days," is "Jhatik yomain," where the first word is the same as the Latin "antiquus."

The other Hebrew word for banner, viz: DeGeh, seems to denote a private flag. It is found in connection with the tribes in their march through the wilderness. Also in Ps. xx: 6. "We will sing about thy salvation (of us), and with the name of our ALoHIM we will bebanner ourselves." Also in Canticles ii: 14, "and his banner over me was love." Ibid. v: 10 "My friend is pure and ruddy; banner-like uplifted from ten thousand." Ibid. vi: 4. "Awe-inspiring as bannered host."

Of the signification of the Fleur de lis I know nothing, but would suggest the possible derivation from Fleur del Isis, or Fleur del Ulyss. This may bring it nearer in connection

with the Labarum cross, and the four main petals of the corolla of the Lotus, which in Hebrew would be $Lo T = 39$, hence either $3 + 9 = 2 \times 6$, or $3 \times 9 = 27$, but to 60 or 600 I see no connection.

I have thus given you, with great pleasure, all that I could collect with my present scanty means of research. The translations are all from the original Hebrew, and without even a look into any version. Perhaps you may find something useful to you in them.

As to the tabernacle, I received a very flattering letter from P. Smyth telling me that a new society in Ireland began to study the tabernacle, and asking him about it, he referred them to my key as the best authority. I answered him, and stated my longing to exhibit a perfect model of it to the world. I can not help believing yet that this exhibition would be a service unto the Lord, in and with which I would be glad to close my earthly life.

The good Lord be with you and yours.

Yours,

EPH. M. EPSTEIN, M. D.

LETTER FROM W. F. ALLEN.

NEW YORK, July 28, 1884.

"The testimony of all persons, without exception, with whom I have come in contact, either in person or by correspondence, has been that wherever the cities have followed the example set by the railroad companies and adopted standard time, not the slightest inconvenience has followed. I have been able to supplement the information on this subject received through a quite extensive correspondence, by an examination of local newspapers from widely separated parts of the country received at this office. No city has returned to local time after really adopting standard time. Louisville partially adopted it; the mayor ordered the city clock changed and the common council ordered it changed back again, other clocks in the city not having been changed. A question of authority was raised and the mayor submitted. While I have no positive information as to this action, I have seen it stated that personal feeling had something to do with the matter.

"On the other hand, the city of Omaha adopted standard time on May 1, 1884. In examining a list of the cities of over 10,000 inhabitants in the United States, I find that 185 out of 229 use standard time. Of those that do not, Ohio furnishes 15, Michigan 8, and the Pacific Coast 8, the rest being scattering. As to the railways the situation is entirely satisfactory. All railroads east of Ogden, Utah; The Needles; Deming, N. M., are using standard time except the two local roads at Pittsburgh, which aggregate about 20 miles in length. Standard time is used on the Northern and Canadian Pacific Railroads for their entire lengths, and by all roads in Washington and Oregon. The only notable exceptions in the entire country are the Central and Southern Pacific Railroads and branches or connecting lines in Utah, Nevada and California. Even the Southern Pacific uses standard time between Deming and El Paso. The railroads in the maritime provinces use Eastern standard time. The city of Halifax uses the time of the 60th meridian. To sum up for the railways, out of about one hundred and twenty-five thousand miles now in operation in this country and Canada, all with the exception of barely four thousand (4,000) miles are being operated by standard time. I have yet to hear the first intimation from any railway official (and I think I should have heard) that the new system does not work with entire satisfaction, nor has any proposition been made to return to local time.

"Of course, the best results have not been secured where the times of cities have not also been changed.

You are probably aware that by act of Congress duly approved by the President,

standard time governs the city of Washington and the District of Columbia. In the city of Boston, Judge Holmes, of the Supreme Court of Massachusetts, decided in a case brought before him that standard time, being generally in use, was legal time. In Savannah, where the change was 36 minutes, the largest employer of day labor opens his shop at 6:30 A. M. and closes at 5:30 P. M., and not the slightest confusion or trouble has been caused thereby. I mention this, not as an isolated case, for there are probably many such, but because it happened to come under my own observation. Since absolutely accurate local time cannot be kept, except by a fixed object, we must use one or another standard. One governing a limited area may be used if one's ideas or business are limited, but to such persons the use of one or another standard would make no practical difference. But since some arbitrary standard must be used in any case, it appears merely common sense that as many as possible should use the same standard. You may ask then: "Why not use a single standard for the whole country?" The answer is that so radical a change is not necessary. If the minutes agree everywhere the hours may have an agreed difference, which all can readily understand. Besides, there was no precedent for such a radical change, while there were a number of cases existing before standard time was adopted where the time used differed from local time by half an hour or more without inconvenience to those who used it. The experience of those who have adopted standard time is simply confirmatory of this. Some object because the hours of labor will be interfered with. The old hours of 7 to 6 have long since ceased to govern the labor of this city, because found inconvenient, and various other times have been substituted. The labor question will settle itself, as all questions relating to time keeping must be settled, and that is on the basis of convenience to the larger number."

W. F. ALLEN.

TRANSACTIONS OF THE OHIO AUXILIARY SOCIETY OF THE INTERNATIONAL INSTITUTE.

JUNE 18, 1884.

At the meeting Martin Coryell, C. E., Lambertville, New Jersey ; F. G. Darlington and Henry Snyder, Pittsburgh, Pennsylvania ; John W. Durkee, Bowling Green, Kentucky ; A. A. Folsom, Boston, Massachusetts ; Rev. L. B. Hartman, Hon. H. S. Little, Lewis Parker and Rev. Samuel Studdiford, Trenton, New Jersey ; Dr. F. O. Nodine, Cleveland, Ohio ; John MacLeod, Louisville, Kentucky ; Dr. C. G. MacManus, Brownsville, Texas ; W. L. Nicoll, New York ; and John B. Kellogg, E. Coombs and Mr. Burbage, Washington, D. C., were elected members.

After the routine of business, the report of the Special Committee on Standard Time, of the American Society of Civil Engineers, was discussed. The report of the Chairman, Sanford Fleming, read at the recent Convention in Buffalo, stated that a number of questions bearing on the whole subject were submitted to men in prominent positions in the railway world throughout the United States and Canada. Ninety-two per cent. of those heard from gave their unqualified support to the proposal to abandon the old traditional division of the day into halves of twelve hours each, and to adopt a single series of hours from midnight to midnight, numbered from one to twenty-four.

Mr. Latimer stated that he approved of the 24 o'clock system, but objected to counting from midnight to midnight, as that idea is promulgated with the object of calculating from the meridian that passes through Behring's Strait, and which is wholly in the ocean.

Mr. Latimer said that railroad and steamboat time should all be counted from astronomical time from 0 to 24 hours, the prime meridian being fixed upon the Great Pyramid of Gheezeh, a monument which has lasted for more than four thousand years, and will last, thus : All the people living on the longitude of the Great Pyramid and half an hour or $7^{\circ}.5$ on each side would have the universal time, and would use but two hands to their clocks and watches. The people living at 15° west and $7^{\circ}.5$ each side of that meridian would have Pyramid time and another hand to mark local time, which would be just one hour earlier than Pyramid time, agreeing, however, exactly in minutes and seconds, the people of 30° west and $7^{\circ}.5$ on each side would have for local time a hand differing exactly two hours from universal time, and so on around the earth ; the difference between the hour hands would at once give the longitude. Every watch and clock on this planet should show Pyramid time, have minutes and seconds for railroad and steamship time, and a third hand should be added to show local time, suited, of course, to the twenty-four meridians around the globe ; but every person on the globe would have the same hour, minute and second for recording the arrival and departure of all steamboats and railroad trains in the world.

In conformity with an act of Congress, the President has called an International Conference to be held at Washington, on the 1st of October next. The Conference will endeavor to establish a prime meridian as a zero for reckoning time and for the computation of longitude. It would appear that at the Geodetic Conference which took place in Rome last October a sop was thrown to England and America in order to secure for the pride of France the adoption of the metric system. The meridian of Greenwich was recommended for adoption as the prime of the world ; but the hope was expressed that if the entire world should agree to accept the meridian of Greenwich as the point of departure Great Britain would find a motive on her side to make a move in favor of the

unification of weights and measures in adhering to the Convention of the metre of May, 1875. The approval of the proposal of the United States for a special conference in Washington was probably a concession merely as a means to secure the ends of the metric men. The act of Congress has authorized the appointment of three delegates for the United States to the Conference to be held October, 1884. A Committee of three was appointed by the President of the International Institute to consider what steps should be taken to have the interests of anti-metric advocates represented.

Rev. H. G. Wood, of Sharon, Pennsylvania, was introduced by the President at the close of the discussion. He gave an exposition of his paper on the subject 'Genealogical Stones in the Great Pyramid.' He showed some remarkable coincidences depending upon the order and position of the courses and floor stones already determined in the Pyramid and the order and number of generations from Adam to Christ as they are given in the first chapter of St. Matthew. Mr. Wood held the rapt attention of his audience, and at the close of his remarks a vote of thanks was passed, and the hope expressed that he would lecture before the Society at an early period.

A general discussion then took place, after which the meeting adjourned till July 2d.

JULY 2, 1884.

The attendance at the meeting evinced the increasing interest manifested in the objects of the society. Seth Dean, Glenwood, Iowa, and H. Darlington, Allegheny, Pennsylvania, were elected members. The Rev. Jevons J. M. Perry Alnwick, England, wrote with reference to the proposed expedition to Egypt, the probable expenses and the work to be accomplished. Theodore Gribi, Elgin, Illinois, wrote respecting the International Conference to be held in Washington in October. He says: "I am looking forward to the International Conference on standard time and meridian with great interest, and I think it very important that we should make a decided effort to make our voice heard there. But first of all, we must seek the sympathy and co-operation of the American Society of Civil Engineers. It seems to me that society should be able to exert a great influence. We should have resolutions printed and supported by the ground on which they are made, and circulated freely among all the members of Congress. Our course will win among all honest men if it is rightly understood. But politicians, as a rule, are comparatively ignorant on the subject, and many of them are easily swayed by what comes from exalted positions, unless they are able to judge for themselves. For this reason they ought to be provided with ample literature on the subject, with an urgent appeal from acquaintances or influential men to look into the merits of our course and the demerits of that which the foreign delegates will urge. Even if the International Congress should pass resolution in favor of the metric system—which is all they could do—it would still require legislative action on the part of our House of Representatives before it could become a law, and all we need to accomplish is the prevention of this. I am inclined to think that the majority of our legislators, professors and engineers are too sensible to be moved to the adoption or even advocacy of the French system, and then the mass of our people and particularly the manufacturers and owners of machine shops who would have to defray the expense of the change, will surely be consulted first and have something to say."

Mr. Gribi's letter was followed by one from Professor Piazzi Smyth, and Mr. Latimer announced that in consequence of the address to be made other important communications would be reserved for the next meeting. Mr. A. M. Searles then read a paper from Mr. George C. Davies, whose impaired health prevented his attendance. Mr. Davies paper was addressed to the metrologists of the institute, and was a plea for simplicity of terms. He says that some of the metrologists of the institute seem to think that an ideal system must be evolved from the old, forgetting that the mission of the society is to "preserve and perfect" the weights and measures in use. He says, "Could the society realize the fact that the easiest and shortest way to dispose of the French metric system will be to memorialize Congress to make the Anglo Saxon weights and measures the legal and only

standards of the country, I think we should cease to hear of the French metric system and its zealous advocates, for we have the people with us."

Rev. H. G. Wood then read an able paper refuting many of the arguments of President Barnard in his articles on the Pyramid, in "The School of Mines Quarterly." At the conclusion of Mr. Wood's paper, Mr. Latimer read a letter addressed to President Barnard, asking for a public discussion of the subject by three representatives from each side.

Mr. Joslin, who had requested to speak at this meeting, then took the floor. His most important point was the correction of the calendar, which, in his opinion, will fully settle the question of time which is now being discussed by scientists.

The meeting then adjourned for two weeks.

JULY 16, 1884.

At the usual fortnightly meeting of the society the following persons were elected members: F. W. Newman, Dresden, Germany; Alexander Hudunt, New York; Henry W. Bigelow, Toledo, Ohio; Dr. J. D. Buck, S. H. Randall, Dr. John Wiggins, Rev. Henry D. Moore, Dr. J. H. Hunt and Charles C. Wood, C. E., all of Cincinnati.

A resolution was passed thanking Professor Smyth for the honor he had conferred on the institute by dedicating to it his new book 'New Measures of the Great Pyramids by a New Measurer,' and for the copies received for distribution to the members.

Mr. F. A. R. Winter, of Georgetown, British Guiana, in a letter which was next read, endeavored to prove that the thorough chronology of the Bible agrees with the Anglo-Sacro thorough record in solar years; and showed that the pyramid measures are in close accordance with both, and further, that as indicated by the symbology of the doubled line to the descending passage of the pyramid, there is a dual reckoning all through, and when the intercalations suggested by the sign placed against the ages of the several patriarchs are supplied, they give the true date.

Letters were also read from Professor Smyth, Royal Astronomer for Scotland; Abbe F. Moigno, Paris, France; Professor R. Kelso Carter, Pennsylvania Military Academy, Chester, Pennsylvania; Professor Theodore Gribi, Elgin, Illinois; Emili Low, C. E., Pittsburgh, and F. Hess, Fort Dodge, Iowa.

On account of limited time the reading of valuable letters from J. R. Skinner, of Cincinnati, and others, was postponed for a future meeting.

The paper of the evening—'Some Objections to the French System of Metrics,' by Jacob M. Clark, C. E., of New York, was then read by Mr. William H. Searles, C. E.

Mr. Clark's principal objections to the system are:

First—It is not a scientific system, violating in its fundamental idea the principle that direct and square measure cannot be logically expressed by a curved line. Again, the system is simply a geographical measure based on a very imperfect division of the circle.

Second—The difficulties attending its introduction, the people being opposed to it in places where introduced and its lack of native popularity.

Third—The advocates of this change in our own country are mainly non-practical men—professors, chemists, some druggists, and the like—to whom the convenience of decimal reckoning outweighs the far greater one of manipulation in engineering, surveying, and the constructive arts; or else those who from foreign training or motives of interest desire a change. If saving of labor is to be sought, experience in handling the measures in the broader and more important works of man might effectually change their views.

The testimony of such experts as Mr. Coleman Sellers, one of the most prominent manufacturers of iron machinery, and others like him, who have tried the French system for years at great expense in their own works only to regret it as inconvenient, together with the almost universal feeling of American architects, engineers and builders, so far as the writer can judge from an extensive acquaintance, is decidedly against the attempt.

Mr. Clark in closing presents a metric or decimal system with the English inch, and the Arabian gauge or quz (equal to 25 English inches), each increased by its 1-1000 part a

units. The paper was discussed at some length, after which the meeting adjourned for two weeks.

JULY 30, 1884.

Notwithstanding the inclement weather the last meeting of the society was largely attended. Members were elected as follows : James A. Collins and William Archer, C. E., of Cincinnati, and C. N. Dubbs, C. W. Fell and Frederick G. Roeder, of Cleveland. Rev. Gustave Seyffarth, Phd. D. D., etc., Yorkville, N. Y., was elected an honorary member.

The Chairman announced the death of L'Abbe Moigno on the 17th instant, and read a brief biographical sketch from the Paris *Le Figaro*.

An article in the New York *Herald*, by Joseph Baxendell, English astronomer, criticizing Professor Barnard's new book, was then read.

In reference to the successful working of the new system of standard time, Mr. W. F. Allen, editor of the "Travelers' Official Railway Guide," wrote the Society that of the 125,000 miles of railroad in the country, all with the exception of about 4,000 miles were operated on standard time, and that it worked very satisfactorily, although the best results were attained in cities which had adopted it ; and stated that of the 229 first-class cities in the United States, 185 had adopted standard time.

The remainder of the evening was taken up in discussing standard time and prime meridian, Messrs. Samuel Beswick, C. E., of Canada, Rev. H. G. Wood, of Sharon, Mr. Robert French, chief engineer Mt. V. & C. Railway, Professor Stockwell and others taking part in the discussion.

Letters were also read from Mrs. Plumtre, of England, and Mr. W. McAllister, of New York.

Meeting was then adjourned for two weeks.

AUGUST 13, 1884.

Rev. H. G. Wood read a paper on 'The Correlation of Anglo-Saxon Measures,' which exhibited some new and most interesting features of the Pyramid.

Mr. Wood also made a few remarks in reference to standard time, and presented a very feasible plan for fixing the watch faces for keeping both Greenwich and meridian time.

The President in a few remarks stated that there had been a bill presented before the last Congress for making the use of the metric system compulsory in the government departments after the year 1889.

Professor J. E. Hilgard in a letter which was read stated that four of the five members of the Committee for the International Conference on zero of longitude, etc., to be held in Washington next October had been appointed, and that he understood that the fifth member was to represent the American Society of Civil Engineers.

The following new members were elected : Louis Queen, C. E., Elizabeth, New Jersey ; Thomas J. Hyde, Sharon, Pennsylvania ; and M. J. Leyland Feilden, of Rappyn den, Burwash, Sussex, England, was constituted a life member.

After some discussion the meeting adjourned for two weeks.

AUGUST 27, 1884.

At the meeting the members elected were : Life member, Archdeacon Stock, Wellington, New Zealand ; members, Mrs. M. E. Locke, Hamilton, Canada ; T. Bahan, Shaws, Pennsylvania ; J. Richardson, Cochran ton, Pennsylvania ; M. Hollaran, Carlton, Pennsylvania ; P. McMahon, Utica, Pennsylvania ; M. Vining, Sugar Creek, Pennsylvania ; David Isanburgh, Franklin, Pennsylvania ; William Hennessy, Reno, Pennsylvania ; Dr. H. R. Heard, Cleveland.

A letter was then read from Professor W. Rogers, of Cambridge, with reference to the metallic bars which he is preparing for the society.

Mr. J. N. Wing wrote respecting the open letter recently sent the President of the United States, requesting that the International Institute may be represented at the approaching International Conference at Washington.

Encouraging letters, enclosing donations to the society, were read from Professor Piazz Smyth and Lewis Biden, Port Sea, England. The recent appeal for aid has received a liberal response and prospects are very encouraging.

A discussion upon the relation of the pyramid measures to Bible chronology then took place, the principal speakers being Drs. Redfield and Newcomer, Messrs. A. M. and W. H. Searles and Mr. Latimer.

In consequence of the length of the discussion the reading of extracts from Lieutenant Totten's work on metrology was again postponed, but a resolution was passed that it should be made the order of the evening at the next meeting.

Meeting then adjourned for two weeks.

EDITORIAL NOTES.

Mr. J. M. Goodwin will accept our hearty thanks for his kind and encouraging words touching the work and prospects of the INTERNATIONAL STANDARD.

In our next issue we will present and compare the systems of tables proposed by Prof. C. Piazz Smyth, Jacob M. Clark, Lieut. C. A. L. Totten and John H. Felton.

In our last issue the letters on Pyramidal Free Masonry, by mistake, attribute to Mr. Wood the theory that the displacements in the Pyramid were caused by heat and warping. It was Mr. S. Beswick who presented this theory.

We have received a letter from Thos. Holland, London, acknowledging, in admirable tone, some criticism made on his problem of the practical construction of the Pyramid. The square and compass are excellent pioneers in Pyramid study, and we hope to have more of Mr. Holland's investigations, even though they may be subjected to the test of mathematical accuracy.

We are glad to present in this number of the Magazine the portrait of one of the most distinguished, though not widely known, workers in the Great Pyramid subject—Robert Menzies. There seems to have been an inspiration in this man's mind which led him to announce that the grand gallery represented the Christian dispensation, for his discovery, which has been accepted by Pyramid students everywhere, has been fraught with most important consequences, and the influence of it has scarcely yet begun to be felt. He was a young ship architect of Leeds.

The Rev. James French has sent us from the Philadelphia *Inquirer* of July 23, notice of a Bill introduced at the last session of Congress to enforce the use of the French metre with the following provisions :

“Beginning on March 4, 1889, the metric system shall be exclusively employed in all Government transactions. In order to secure this employment a knowledge of this system shall be taught in all schools and colleges under the control of the government or hereafter aided by it, or such knowledge shall be required for admission to those institutions.’ There is a proviso to the effect that in all other transactions than those in which the United States is a party it shall be lawful to employ the weights and measures now in use. This bill was read twice on June 30 and referred to the Committee on Coinage, Weights and Measures.”

A correspondence has been submitted to us between Emile Low, C. E., of Pittsburgh, and Mr. Theo. Gribi, of Elgin, Ill., in which the former declares himself an earnest advocate of the metric system, “not on account of its being *French*, but a decimal system.” He states that the Waltham Watch Company has used the metric system for eight years, and quotes them as saying that “the advantages of its general adoption are so palpable that it would be useless to state them, as anybody at all acquainted with the subject would know”; and

adds, "These are my sentiments exactly." To which Mr. Gribi, of the Elgin National Watch Company, replies: "We have never used any other system than the English—the inch decimally divided—and we do not find the least inconvenience, nor feel the slightest practical disadvantage. If the advantages of the general adoption of the French metric system are so palpable, it must be very easy to state them, which would be wiser and carry more force than to discredit the intelligence and honesty of the reader who may happen to disagree with the writer, by saying, 'it would be *useless* to state them.'" Mr. Gribi further says, "I am, myself, practically acquainted with the metric system, having been born and educated in a country (Switzerland) where it is enforced, and having used it all my life until within the last six years; yet I find reasons, and good ones, for regretting its introduction. Our legislators may commit the folly of passing a law making it legal, but they can never compel its adoption, and if they should try to do so, it will cause incalculable mischief and wrong."

MONTHLY RECEIPTS FROM SUBSCRIBERS TO THE INTERNATIONAL STANDARD FROM JUNE 9TH TO AUGUST 31ST.

JUNE—Martin Coryell, \$5; F. G. Darlington, \$5; Thos. B. Lee, \$2; John W. Durkee, \$2; Prof. C. Piazzi Smyth, \$1.22; John N. Poage, \$10; John B. Kellogg, \$2; E. Coombs, \$2; Mr. Burbage, \$2; Seth Dean, \$2; F. A. R. Winter, \$3; Miss Augusta Barr, \$2—Total from June 9th, \$38.22.

JULY—H. G. Morse, \$2; John MacLeod, \$5; C. T. Heisel, Magazine, .80; H. W. Bigelow, \$2; Hon. Peter Watson, \$2; Dr. J. D. Buck, \$2; Dr. John Wiggins, \$2; F. W. Newman, \$2; Dr. C. MacManus, \$2; Alex. Hudunt, \$2; Capt. J. S. Richards, \$2; T. H. B. Beal, \$2; F. Hess, \$10; S. H. Randall, \$2; Chas. A. Wood, \$2; J. Ralston Skinner, \$5; Dep't Interior, Educational, \$2; Col. J. F. Hammond, \$2; James A. Collins, \$2; Wm. Archer, \$2; Wm. McAllister, .40; E. W. Fell, \$2; C. N. Dubs, \$2—Total for July, \$57.20.

AUGUST—Thos. R. Reeves, \$20; James G. Johnson, \$10; Louis Quien, \$2; J. H. Devereux, \$25; Thos. J. Hyde, \$2; C. L. Redfield, \$2; Jesse H. Jones, \$2; Wm. Chisholm, \$50; Clark Fisher, \$20; E. Collopy, \$12; P. Collopy, \$10; Geo. M. Tuttle, \$2; J. Leyland Feilden, \$24.35; John H. Walsh, \$10; Arthur S. C. Wurtele, \$2; Charles Kellogg, \$10; C. S. Maurice, \$10; Sandford Fleming, \$10; James McIntyre, \$10; L. F. Haskell, \$1; Frederiek G. Roeder, \$2; Rev. H. G. Wood, \$5; Mrs. Angie Damon,

\$10; Miss Emily Damon, \$10.85; John Forrest, M. D., \$2; Geo. Kellogg, \$10; F. R. Kimball, \$5; G. M. Atwater, \$10; Thomas Bahan, \$5; James Richardson, \$2; M. Hollaran, \$2; P. McMahan, \$2; Michael Wing, \$2; D. Isanburg, \$2; Wm. Hennessey, \$2; Michael Kating, \$10; P. Bowen, \$10; Lewis Biden, \$9.74; Prof. C. Piazzzi Smyth, \$24.35; Dr. H. R. Heard, \$2; J. Wylie Smith, \$2—Total receipts, August, \$364.29.

REVIEWS.

We have received the masterly work of Lieut. C. A. L. Totten, 'An Important Question,' and we heartily commend it to our readers.

It was written to be read before the members, at the meetings of the International Institute, but on account of the extent of the work, Lieut. Totten decided to publish it in its present form.

His system of metrology is cosmical; to call it ingenious would be a tame meed of praise. It is the development of a genius. In one point we disagree with him, viz., in the rejection of the 360° circle and the substitution of the 240° . Many of us feel assured of the relation of the 360° circle to the Pyramid.

We, however, ask a most candid examination of this work, and think it the duty of all members who are able to buy the book to do so, and aid so noble and disinterested a worker. He has no hope of pecuniary gain; he works only for the cause of truth, and will devote the proceeds to the advancement of our whole work.

Referring to an utterance of Garfield regarding the standard of weights and measures, "By laws higher than human legislation, length, depth and height were created; men can only name and declare a definite length as a standard," Lieut. Totten says: "We believe that our ascestors have bequeathed to us a system based upon these higher laws. By the attrition of full four thousand years, our Anglo-Saxon system has lost so little of its ancient truth, that we believe its present possessors—direct descendants of a mighty race—may return to the ancient perfect standards without any inconvenience, and with-

out altering a single name familiar to our children and to history."

Respecting the inch, he says: "Without reference, therefore, to the absolute length of the unit inch, save that it shall be, when determined accurately, one 500-millionth of the polar axis (and until so determined shall be held at its present statute value), we may agree beforehand that the rectified long measure shall be as heretofore, and as follows." He then gives a table of rectified long measure.

The cuts of the obverse and reverse of the U. S. seal are made by Lieut. Totten upon the advanced and perfect rule of Heraldic art. The cut of the reverse—a pyramid unfinished—is beautiful, and in Mr. Totten's opinion it should be so cut for government use.

We will have a more extended notice and examination of this work in our next issue, but, meanwhile, recommend our members to read the book.

NEW MEASURES OF THE GREAT PYRAMID. BY A NEW MEASURER. Described and Tested by C. Piazza Smyth, Extended and Corrected from the Review in the *Banner of Israel* for November and December, 1883.

The dedication is as follows:

"To the International Institute, Cleveland and Boston, U. S. A., for preserving and perfecting hereditary weights and measures, more especially the Anglo-Saxon, and for the discussion and dissemination of the wisdom contained in the Great Pyramid of Jeezeh in, but not of, Egypt, this little book, descriptive of some new information on the grand subject which the members have so much at heart, is dedicated by one who has worked at this Pyramid question for close upon twenty years (or ever since the death of the late John Taylor, who commenced it on its present lines), and with continually increasing belief that there is more than accident, more than man's intent, in both its primeval origination and now latter-day intellectual development, is dedicated most respectfully, by their devoted fellow-laborer, C. Piazza Smyth, Astronomer Royal for Scotland, and for this cause, Ex. F. R. S., London."

At a meeting of the Society, July 16th, a resolution of thanks was passed to Prof. C. Piazza Smyth for the honor he had conferred upon the International Institute by dedicating to it this valuable contribution to Pyramid literature. As the review from the *Banner of Israel* has already appeared in our Magazine, we will not give here an extended notice of this work, but recommend it to our readers as an epitome of the latest information on the subject of the Great Pyramid. It is printed and published by Robert Banks, Racquet Court, Fleet street, London, England.

NOTES AND QUERIES.

APOCRYPHA AND APOCALYPSE. What is the true meaning of these words?

A SEEKER.

The word Apocrypha is from the Greek *apokryphus*, and means *hidden, spurious*. In Matthew's translation of the Bible, published in 1537, the duteo-canonical books were separated from the others, and prefaced with the words "The volume of the books called Hagiographa." In Cranmer's Bible published in 1539, the same words were continued; but in the edition of 1549, the word Hagiographa was changed to Apocrypha which passed through the succeeding editions and into King James' version. These apocryphal books are received as canonical by the Roman Catholic church, and are intermixed with the Old Testament books in the Douay version. The Protestants reject them as being canonical, but receive them as historical. Hence the term as now generally used is in the sense of uninspired.

The word Apocalypse is from the Greek "apokalypsis," and means "to uncover," "to reveal." It is the Greek name of the last book of the New Testament, translated Revelation. From the many interpretations put upon this book it would seem to be a misnomer, and the hidden sense of apocrypha to be more in accordance with its estoric meaning.

ENOCH THE SECOND MESSENGER OF GOD. I am led to inquire further in reference to this recent edition or version of the Book of Enoch by Dr. Kenealy, and why called the Second Messenger of God? I never heard of only Richard Laurence's translation of the Book of Enoch.

E. M. J.

In answer to this correspondent we will take the facts as they appear in the works of Dr. Kenealy, six thick octavo volumes having been published prior to the author's death which occurred about four years after publishing the Book of Fo. This eloquent author's volumes are ample proof of the onward progress of the human race. He asserts the Apocalypse to be far older than christianity, and to have come down from the most remote antiquity, being the revelation of the whole drama of human history. With almost infinite learning and patience, he has endeavored to show that the Apocalypse was originally revealed to a primeval John, otherwise called Oannes, and identical with the First Messenger of God to man. His theory is sufficiently remarkable to be given here. The Messengers of God are twelve in number, and are claimed to have appeared at intervals of 600 years as follows :

1. Oannes (Adam), A. M., 3,000 ; 2. Enoch, A. M., 3,600 ; 3. Fo-hi (Budda), A. M., 4,200 ; 4. Brigoo (Brahma), A. M., 4,800 ; 5. Zaratust (Zoroaster), A. M., 5,400 ; 6. Thoth (Hermes), A. M., 6,000 ; 7. Amosis (Moses), A. M., 6,600 ; 8. Loa-Tseu (Confucius), A. M., 7,200 ; 9. Jesus (Christ), A. M., 7,800 ; 10. Mo'-Ahmed (Mo-hammed), A. M., 8,400 ; 11. Chengiz-Khan (King of Kings), A. M., 9,000 ; The 12th Messenger yet to be revealed, A. M., 9,600.

With the aid of this theory the whole history of the world down to the present time is shown to be foretold in the Apocalypse, and although it may be difficult for many to agree with this accomplished author's conclusions, supported by him with an array of learning, and a sincere belief in what is stated, no one with any taste for these studies should be without this illustrated wonderful series of books. Throughout the many thousand pages of closely printed matter, the writer manifests a sincere reverence for true religion, and seeks only to expose the errors which priests and interested persons have promulgated from time immemorial. The author remains strictly anonymous throughout his entire series. The title-pages of his volumes are printed in colors, and all bear the symbolic name, "by ☉," (the central spot being black), followed by quotations. Their titles are as follows :

The Book of God. The Apocalypse of Adam-Oannes, by ☉. "I will teach you by the hand of God ; that which is with the ALMIGHTY ONES will I not conceal."—Job xxvii, 11—pp. 647.

The Book of God. An Introduction to the Apocalypse, by ☉. "Unto you, O Men, I call : and my voice is to the sons of Adam."—Proverbs viii, 4—pp. 752.

The Book of God. A Commentary on the Apocalypse, by ☉. "I will declare dark sayings of old."—Psalms lxxviii, 2—pp. 853.

The Book of God. Enoch the Second Messenger of God, by ☉. Vol. I, Frontispiece—Circle of Inchoation. *Alpha* and *Omega*—pp. 368. Vol. II, Frontispiece—Cwenila. *Alpha* and *Omega*—pp. 339.

The Book of God. Fo the Third Messenger of God, by ☉. Introduction illustrated with Budda—pp. 333.

When this volume was through the press the author's death was announced which closed the elaborate plan of the author. The next two volumes which were in preparation were, "The Book of Lao-Tseu, the Fourth Messenger of God," and "The Book of Zaratust—The True Zend-a-Vesta—the Fifth Messenger of God."

ERRATA.

PAMPHLET.

Report on Standard Time, also same report appended to INTERNATIONAL STANDARD July, 1884.

Page 15—5th line from bottom, for “unexplored” *read* explored.

Page 16—5th line from top, for “exploration” *read* exploitation; 3d line from bottom, for “nearly attainable” *read* nearly perfect attainable.

Page 19—33d line from top, for “the geography” *read* geography.



CHARLES CASEY,

Born in city of Dublin, Ireland, 1822, hypothetical discoverer of the mysterious **Mes-** sianic date line 2,170. Deduced from Robert Menzies' thesis, and demonstrated by the laboriously accurate test measures of C. Piazza Smyth.—See 'Our Inheritance in the Great Pyramid,' pp. 465-470.

THE
INTERNATIONAL
STANDARD

A MAGAZINE

DEVOTED TO THE DISCUSSION AND DISSEMINATION OF THE WISDOM CONTAINED
IN THE

GREAT PYRAMID OF JEEZEH IN EGYPT

NOVEMBER, 1884.

ISSUED BIMONTHLY. PRICE 35 CENTS

TERMS OF SUBSCRIPTION AND MEMBERSHIP, \$2.00 PER ANNUM IN ADVANCE.

The International Institute as a body is not responsible for the facts or the opinions put forth by any of the writers for this Magazine.

All in favor of advancing truths most absolute, as portrayed in the revelations of the Great Pyramid of Egypt, and of the success of the Society in preserving inviolate the Anglo-Saxon weights and measures, will kindly communicate with the President, by whom also subscriptions, donations and communications will be gratefully received.

THE INTERNATIONAL INSTITUTE

FOR PRESERVING AND PERFECTING THE ANGLO-SAXON WEIGHTS AND MEASURES

CLEVELAND: 64 EUCLID AVENUE

INTERNATIONAL INSTITUTE FOR PRESERVING AND PERFECTING WEIGHTS AND MEASURES.

FOUNDED NOVEMBER 8, 1879.

CHARLES LATIMER, President, Cleveland, Ohio.
J. S. F. HUDDLESTON, Vice President, Boston, Mass.
LUCIAN I. BISBEE, Secretary, Boston, Mass.
G. R. HARDY, Treasurer, Springfield, Mass.

OHIO AUXILIARY SOCIETY.

CHARLES LATIMER, President. **WM. H. McCURDY**, Treasurer.
A. M. SEARLES, Vice President. G. W. CROSSETTE, Cor. Secretary.
MARY B. SANFORD, Recording Secretary.

PUBLISHING COMMITTEE.

CHARLES LATIMER, C. E. } Editors. J. H. DOW. J. W. REDFIELD, M. D.
H. C. THOMPSON, } W. W. WILLIAMS. } A. BIDWELL.
MRS. A. M. SEARLES. MARY B. SANFORD.

COMMITTEE ON STANDARD TIME.

REV. H. G. WOOD, Chairman of Committee, Sharon, Pennsylvania.
PROF. PIAZZI SMYTH, Astronomer Royal for Scotland, F. R. A. S., F. R. S. E., etc.,
Edinburgh.
M. L'ABBE F. MOIGNO, Canon of St. Denis, Paris, France, editor of *Cosmos Les Mondes*,
and author of "The Splendors of the Faith."
SANDFORD FLEMING, C. M. G., M. Inst. C. E., F. G. S., F. R. G. S., Ottawa, Canada.
WILLIAM H. SEARLES, C. E., Elyria, O.
JACOB M. CLARK, M. Am. Soc. C. E., New York.
PROF. STOCKWELL, Astronomer, Cleveland, Ohio.
CHARLES LATIMER, C. E., Cleveland, Ohio.

WILLIAM W. WILLIAMS, PRINTER,
145 and 147 St. Clair Street, Cleveland, Ohio.

THE INTERNATIONAL STANDARD

NOVEMBER 1884.

PRESIDENT BARNARD'S ATTACK ON THE GREAT PYRAMID METROLOGY.

COMMENTED ON BY C. PIAZZI SMYTH, ASTRONOMER ROYAL FOR SCOTLAND, AND AUTHOR OF "OUR INHERITANCE IN THE GREAT PYRAMID," "LIFE AND WORK AT THE GREAT PYRAMID," AND "NEW MEASURES OF THE GREAT PYRAMID, TESTED."

After a long interval, during which any mere accidental errors in the earlier portions might well have been corrected, the third part of the Very Reverend President Barnard's discourse on the Great Pyramid Metrology, in the Columbia College's "School of Mines' Quarterly Journal," has reached me. And as I have now read it carefully, equally with its predecessors, the time seems to have arrived for saying something of how I find it.

Its first portion, you may remember, appeared in January, the second in March, and now the third in May, 1884; and the three mount up altogether to nearly a hundred pages. It might naturally, therefore, have been expected that so bulky an article,—coming from one of the mature age and dignified standing of President Barnard, of scholastic reputation in past years as a physical mathematician, and, if I am informed aright,

a fully ordained clergyman of rather pronounced High Church proclivities, as well as the chosen ruler and chief example to the students of Columbia College,—would prove to be a very important contribution to latter-day Great Pyramid literature.

Such, however, is unhappily far from being the case. For, just as always happens with any smaller men venturing to ridicule a subject before they understand it, and then falling into grievous errors, so even the very learned and Reverend President Barnard having, with but little knowledge of the Great Pyramid's metrological theory, undertaken to abuse and denounce it for a purpose, he makes so many mistakes or misstatements, and some of them of the first magnitude, that there is little or no force in his essay after all for those who have already studied the subject. He simply shows us the saddening spectacle of an old man blindly caring very little for either what words he uses or what sentiments he expresses, only so that the Great Pyramid metrology shall be very effectually stamped out of all recognition, and nothing connected with it be ever again allowed to form a serious obstacle to the American people, at his advice and suasion, giving up their hereditary Anglo-Saxon metrology, and enslaving—emasculating, a recent writer calls it—themselves in deference to the utterly foreign and most unsuitable French metrical system.

If the attack had only been plain and straightforward it might well have been left to sink or float on the stream of public opinion, as its merits or uses might deserve. But there are so many most tortuous accounts of important matters of fact; and wherein, too, I have the distinction of being professedly quoted and held up to scorn as the peccant authority—that some, at least, of these cases should be unravelled, if only to warn ingenuous readers that for anything crucial I may have written on the Great Pyramid subject, especially as touching its most advanced and latest published features—they should refer to my own words, and never trust Professor Barnard's versions of them.

Even as to date, so all important in a subject gradually unfolded during the last very few years and still unfolding, the President quotes only from the second edition of my 'Inheritance in the Great Pyramid,' actually calling it, however, in

1884, "the new and enlarged edition," though it was published to his own knowledge so far back as 1874, while the third edition, almost re-written and much extended, had appeared in 1877; and the fourth, still more increased and improved, in 1880.

But far more deeply disappointing was it to me to find the Reverend President taking up the scoffing sneer of a vulgar and I fear infidel author, and calling my whole scientific research into the facts and history of the Great Pyramid, on the lines opened up by the late John Taylor, "the Pyramid religion" (p. 108); "the Pyramid faith" (p. 108); "dogmas of the Pyramid religion" (p. 300); and speaking of some other plain-working and God-fearing men in science as "the Pyramid religionists" (p. 107); "preachers of the Pyramid faith;" "devotees of the Pyramid faith" (p. 309); and "the apostles of the ancient Pyramid faith" (p. 329); while he pretends to be very restive and indignant at "the doctrine preached to us by the disciples of the Pyramid faith" (p. 212). In fact the continued misuse for a contemptuous purpose, through all three papers, of words considered sacred among all Christians, makes one wonder distressfully at last what sort of ideas of religion itself President Barnard can possibly have. Not very Biblical it would seem, for on his opening page he assumes the history of Adamic man upon earth as wholly an affair of his own voluntary, spontaneous, unaided effort, whereby he raised himself from the lowest stage of savagedom into civilized life and high mental attributes, or in total contradiction to what the Bible says of it. And with similar want of agreement with revelation, on his fifth and sixth pages, the president alludes to the duration of Noah's life after the deluge as though it had been a span of a few days only, while the Biblical chronologies make it extend to any period between three hundred and fifty and twelve hundred years.

Hence to tell such a one that he is profaning the name, objects and character of "religion" to apply it sneeringly to a subject with him of scientific enquiry only, and which has never been brought forward as a "religion" by those who have studied it; has never been hinted at by them as a method of salva-

tion; never spoken of as a mode of approaching God for the forgiveness of personal sins, nor intended in the slightest degree to alter or supplant a single item in the Gospel of our Lord and Saviour Jesus Christ, though it may, and has most unexpectedly brought to light, remarkable corroborations of some of the primeval divine inspirations in earthly wisdom from God to man. Inspiration in this case afforded apparently to one of the earliest Hebrew prophets a grand existency in those times, and once temporarily in Egypt, but antagonistically to the Egyptian idolatry there. To speak, however, I repeat, of the real characteristics of true religion to such a one as the president shows himself to be throughout his three discourses, is to speak to a merely dry schoolman who, in spite of any amount of such learning, remains and ever will remain entirely unappreciative of the very fundamentals of our blessed Christianity.

Contenting myself, therefore, with a simple protest against President Barnard's continued profanations of the word "religion" and whatever is connected with it, I proceed to examine, at rather greater length, some of his misrepresentations of those scientific numbers and facts on which the inspired, long-concealed and anti-Egyptian principles of Great Pyramid metrology rest, for some of its most unexceptionable proofs.

These numbers and facts having been largely obtained from the ancient monument, and first published in numerical form by myself, it seems a settled object with the president to invalidate me as a measurer, reject my measures, and then present the Great Pyramid metrology to his readers, without any of my doings mixed up with it. That, too, is perhaps allowable and understandable enough as a method of war; though I must even then regret that careful mensurations of important parts of the monument, not yet measured by any one else, are not to be allowed to appear any more before the world, because forsooth President Barnard has chosen to object to the person who made them, for reasons of his own invention.

Yet why, after that, does the president next run the same person down with equal or even greater vehemence, for *not* having made measures of certain other parts of the Great Pyra-

mid? Such illogical inconsistency is almost incredible; yet, towards the end of his first paper, the president occupies no less than three pages with bitterest invectives against me for not having, with my own hands, measured the base-side length of the Great Pyramid in 1865. He paints an ideal picture of my having had unlimited time, money, instruments, men and whatever was necessary for making that measure; and thereby, according to his previous harangue, of inevitably vitiating the stream of Pyramid knowledge at its fountain head. And yet I did not do that mischievous thing. But now, precisely because I did not, he accuses me again and again of being absolutely "unpardonable," and even infers that there must be something particularly black about the omission.

Seeing, however, that I went out to the Great Pyramid on my own private idea alone, at my own private expense, on a limited leave of absence from my duties at home, and with no more funds than the little I could squeeze out of my miserable salary of £300 *per annum*, it was rather a wonder that I could go out at all and do anything in that expensive region. But at least I was my own master to choose what I would do myself, and what I would leave to others in a work far too large for me to contemplate undertaking the whole.

Now, in making this choice, I was largely guided by what other explorers and measurers were taking up at that particular time. Wherefore, if the president, waxing still more condemnatory of my having omitted to make that base-side length measure myself, seeks to justify his condemnation by adducing this further fact that, in his own words, "two engineers, Aiten and Inglis came to Gizeh when I was there to make that very measurement," and did make it "with a thoroughness of which there had been no former example"—that was exactly why I kept on working at the other subjects I was engaged on, and did labor at, every moment of my time, until the day of my forced departure. For is not division of subject as well as labor, a recognized method everywhere for enabling a few workers to gather in an extensive harvest? Or, if I am to be of no authority upon the Great Pyramid because my own measures there, though numerous enough according to the

president, to fill a volume, did not include one of the base-side length, of what standing is President Barnard, who has never measured anything whatever of the mighty monument, and has not even seen it?

The president, however, is not quite right in saying that Messrs. Aiten and Inglis measured the Great Pyramid's base-side length under my very eyes, for they came rather when I was leaving, made their chief measurements after I was gone, and communicated the results to me only after we were all returned to Scotland. More decidedly, too, is the president wrong in insinuating (p. 117) that I called them "blundering engineers," and declared their measurements to be "to my disgust." Those are *his* choice phrases, and I leave them to him to explain whenever Messrs. Aiten and Inglis may call him to account.

For myself—although more accurate measurings have been taken since then by several parties—I consider Messrs. Aiten and Inglis' result a most important step, very happily made at the time it was, towards the discovery of the truth touching the Great Pyramid's base-side length as intended by its ancient architect. Previous to their visit, the only *socket-defined* measures had given (in British inches) 9164 and 9168, or something like these numbers; and nothing less than 9160 with some few units appended, could be admitted. But when Messrs Aiten and Inglis announced their mean result to be 9110, and the Royal Engineers gave out 9130 a few years afterward—it was evident that with due scientific regard to all the measures taken on the ground, and the principles of discussing such observations afterwards—no result so high as 9160 could be entertained; nor, again, any so low as 9110, but that the truth should lie somewhere between; and I came, moreover, early to the conclusion of 9140 being the true quantity to the nearest whole inch. Yet on this point also is poured forth once more the wrath of the president, who, overlooking that before I theorized on them I had printed Messrs. Aiten and Inglis' simple numerical results so faithfully and fully that those able engineers were content with that publication; and overlooking also that it is the universal practice of all scientific men, when taking

means of discordant measures of one and the same quantity in Nature, to assign weights to the different results if they know of any causes which should make one more, or less likely to be truthful than another—the president, I say, inveighs against me for having arrived at that number, 9140—when it was neither the simple arithmetical mean of all the quantities taken as of equal weight, nor was it any one of the quantities taken by itself alone, as absolutely exact and without the smallest reference to the others.

To all which taunts I can answer most conscientiously, “Of course not!” And though the president comes out soon after with a further evil insinuation, that the 9140 was brought out “because it was wanted,” but that it ought to have been 9140.176045, a futilely, hair-splitting expression worked out by himself, and of which only the first decimal place is likely to hold for more than a few years. I must now leave this over-long subject of the base-side length of the Great Pyramid, for it will come up again in another place; and meanwhile we have the president’s diatribes on both my measures made, and theoretical explanations published, for the size of the coffer, inside of the Great Pyramid,—to notice.

This coffer subject is taken up chiefly towards the end of the second, and beginning of the third, part of the president’s essay.

That very little reliance, in his opinion can be placed on my measures there, the president (p. 294) implies, not from any new discoveries of his, but merely from my own numbers, purposely published by me long ago, to exhibit the discrepancies of different methods, but yet the convergence of certain commensurabilities; as thus, for the capacity of the coffer:

From direct interior measures,	71.317	cubic Pyramid inches.
From exterior measures, halved	71.160	“ “ “
From seem of bottom and sides,	71.266	“ “ “

He allows, however (p. 213), that “the contents, by different methods, vary from a little above to a little below 71.250 cubic inches,” but makes it his chief contention that my theoretical explanation of that quantity is obtained by using false numbers. I had looked on it as the tenth part of the cube of the ten-

millionth of the length of the earth's polar axis in inches, multiplied by the mean density of the earth expressed in terms of water. And that the president allows is not wrong in itself, but only in the flagrancy of my having taken (as he is bold enough to aver) a value of the axis of the earth divided by ten millions (*viz.*, 50.05 British inches) "which no computer has ever found," and a number expressive of the earth's density (5.7) "which no investigator has ever reached."

Yet what investigators have reached in this latter subject, even as given by the president in another paragraph, has varied from Cavendish's 5.32 in the last century, to Airy's 6.56, in the present! But considering the late Mr. Baily's quantity of fifty years ago more probable, and calling it 5.66 instead of the 5.675 at which Baily announced it, President Barnard finds my Pyramid-derived quantity of 5.70 too large by 0.04. Why, however, when he is writing for the youth of his country, in 1884, does he not quote the latest and best authority in all physical science, *viz.*, Mr. Joule, in the Royal Society Proceedings for 1878, bringing out from new experiments of a grand order, the number 5.69, or only 0.01 less than my Pyramid quantity. And seeing that so eminent a scientist as Sir G. B. Airy had previously brought out a number 0.86 larger, the Pyramid result of 5.70 cannot be said with any truth to be too large beyond all precedent.

But touching the earlier element in the coffer calculation, *viz.*: the ten-millionth of the length of the polar axis of the earth, in British inches, it is quite true that I had used that quantity as being 50.05 long, whereas the president of Columbia College now pronounces it to be only 49.273 of the same units in length; and then, cubing that terribly smaller number instead of the larger one, and multiplying the result also by his small version of Baily's earth density, in place of the Pyramid quantity, he brings out for the final theoretical contents of the coffer, on my lines of explanation as he tells his readers, only the miserable 67.865, in place of 71.464 British, = 71.250 Pyramid, cubic inches.

No wonder, therefore, that he denounces this 67.865 number,

in its littleness, as "a disgraceful break-down of the *rationale* of Professor Smyth's process!"

But is the president, in arriving at it, any more correct in his 49.273 number for the ten-millionth of the earth's axis of rotation than he was with his 5.66 for the earth's mean density? For authority he refers to his own previous statement in another part of his paper, giving the last five, and supposed best, computations in the whole world of the length of the earth's rotation axis, derived from arc of the meridian measures, and then he quietly takes 49.273 as the ten-millionth part of the mean of them all.

But, on referring ourselves for the full, original numbers to his page 122, we find given there, for the length of the earth's polar axis:

- By one authority = 500, 489, 604 British inches.
- By another authority = 500, 504, 818.9 British inches.
- By another authority = 500, 491, 440 British inches.
- By another authority = 500, 487, 768 British inches.
- By another authority = 500, 490, 432 British inches.
- And by another in a note = 500, 532, 230.4 British inches.
- By another in a note = 500, 550, 410.4 British inches.
- By another in a note = 500, 369, 956.8 British inches.

And how, out of all or any of these quantities actually given by himself, the learned president of Columbia College can get 49.273 as the ten-millionth part, must be a matter of astonishment to the world and of grief to his friends. For, whether it be by a blunder or a perversion, the error is huge enough to throw modern science, as represented by President Barnard, back through the ages two hundred years at least, while it leaves my Pyramid quantity of 50.05 absolutely untouched and irrefragable so far as it goes.

Another class of misstatements and asserted detection of error in the Great Pyramid theory as held by others as well as myself, is illustrated by what the president writes of temperature. He begins by erroneously assuming that they all allude, in their standard quantity, to the mean temperature of the entire surface of the earth, on which hypothesis of his own he concludes their 68° Fah. to be much too high. Yet they had particularly confined themselves to permanently man-inhabited

latitudes, signally excluding therefrom the circumpolar portion of either hemisphere; wherein (see Job xxxviii, 22-23) God has laid up his stores of cold, and which, though man desires to break into, he has never yet succeeded in reaching. For though he has been for centuries sending thither expedition after expedition of ships, men and money, each of them has failed, stopped half way, and on its return—even down to the barely recovered survivors of the last party just snatched from the jaws of a miserable death, in the present year—it brings back more and more appalling accounts of hardships, obstacles and impossibility to man.

And again, while the president chooses to contend that the region of lower Egypt, having a higher mean temperature than 68° , prevents the Great Pyramid representing that quantity, the Pyramid students have always been particular in pointing out that the Great Pyramid does not stand in the low country of lower Egypt, but on the table-land of the desert to the west of it, where the temperature is sensibly less, while the critical quantity of 68° is considered even there not to apply to the level of the ground, but to the elevation of the king's chamber above it.

But if there is any one part more than another of the Great Pyramid theory which all its students and illustrators have been agreed on for many years past, it is, that the mind which directed its architecture to embody certain deeply significant numbers, weights and measures expressive of the earth's cosmical relations, was Palestinian and Hebraic, not Egyptian; and its purpose not for contemporary instruction to any one, and least of all, to the rebellious idolatry of Egypt, but to serve the future plans of God, and to come out as a most unexpected sign and witness to him (see Isaiah xli, 19-20) during the latter, *i. e.*, these present, days of the earth. So that, for the success of its high intentions, the hidden nature of the one Great Pyramid in, but not of or pertaining to, Egypt, was necessarily concealed from the people of that land. Yet, says the imperturbable President Barnard, when there is not found upon any Egyptian building a single inscription to tell the Egyptians that the Great Pyramid was erected for such a purpose, how can we believe? it

This ejaculation of the president's may be left to answer itself in the present age, and in the homes of every Anglo-Saxon Christian community, where each earnest enquirer has something much better to guide him as to the history of the God of Israel's dealings with his chosen people, and his preparations for the Christian era "from the beginning of the world," than any inscription ordered to be painted upon the buildings of their own days by the Pharaohs of old Egypt—the authors of those colossal idols which God declared should bow down, and they have done so.

Nor are the very curious details of modern practical science, in its newest laboratories, any safer guides to those who would reverentially seek to become acquainted with the ancient messages of inspiration from God to man. So that when President Barnard describes all the little tools and nice materials, the glass plates, microscopes and delicate balances of a modern weight-and-measure making workshop, and finding nothing of them but only the gigantic coffer vessel in the king's chamber of the Great Pyramid, declares that that cannot have been intended to be a vessel of accurate capacity measure, or to illustrate any high principle connected therewith, we feel inclined to ask him how much he finds about priests' vestments, wax candles, altar cloths, painted windows and the thousand-and-one of ecclesiastical adornments which High Church clergymen of his class deem so very important, in the New Testament? And yet that inexpressibly Holy Book contains all that is necessary to the salvation of man, and has altered the face of the world in establishing the Christian religion thereon.

But worse follows when the president employs the magnificent powers of the learned mind with which he has undoubtedly been gifted, to raise up mystifications of dates out of profane story to confound the chief dates of sacred history. Or when he resuscitates undoubted idolatrous and artistical architecture, as that of the Temple of Ephesus, to compete with the purity of, and New Testament allusions to, the Great Pyramid's peculiar points of symbolization and construction. But so self-satisfied is he with his own performance that—deeming he has now entirely suffocated the Great Pyramid theory under his

heaps of sarcasm, ridicule and misstatement—he actually suggests, with sneering charity, that the poor Pyramid students should henceforth take up and work out the heathenish views which he has just suggested to them.

The said students of the Pyramid, however, so far as I know anything of them, would much rather that President Barnard should work out his own theories, and be left to stand before a higher tribunal than man's. While it might be wise in him to allow conscience and public opinion to speak and answer the question: Is it becoming in one who professes to be a teacher of the Gospel of Christ to deride those who own no other Master than the Lord Jesus Christ, and to put heathen gods and goddesses as teachers and examples before men?

In what lowest deeps, however, are there not deeper pits still. For the third section of the president's attack concludes with a notice of Mr. Flinders Petrie's book, out of which he picks that particular part of the base-side length discussion touching the Great Pyramid, which is computed on the assumed level of the pavement piece near the middle of the side, and makes it, at that elevation, only 9068.8 inches. This quantity the president presents as the only result, so that, positively concealing everything else which both that author and all other Pyramid measurers for a long time past have had to say with regard to the original and Scripture-justified base-side length depending on the sockets cut into the rock at a lower level, and reaching there in one case to more than 9139 inches in length, the "Very Reverend" President expresses himself thus:

"The form of the base is sensibly square. The side of this square has been hitherto the unknown quantity in the Pyramid religion, but it has been a fundamental article in the creed that it should measure just 9,140 British inches. By the inexorable laws of trigonometrical science it is proved to measure, in fact, only 9068.8 British inches. With this determination the beautiful union of the sacred cubit and the length of the tropical year melts away into the air, to be heard of no more among men."

Than such a sentence as this, wilful perversion, misstatement

and concealment of facts, can no further go. Happy for us that it is found, not in the papers of any of the members of the International Institute for Preserving and Perfecting Anglo-Saxon Weights and Measures, but in those of a would-be enslaver of his countrymen to the atheistically introduced French metrical system. An aged man, whose gray hairs might well have led to better things, but like most aged men so prone to live in memory of the past that he evidently is not yet awaked to the newly discovered glorious destinies of the Anglo-Saxon race, the coming "Heir of the World," under the divine promise of old, and with no longer therefore any need—as in times of ignorance, poverty and scanty numbers now happily passed through—to Frenchify itself in order to rise to the greatest heights and privileges of civilized man, in allegiance to Almighty God alone.

C. PIAZZI SMYTH.

P. S.—The foregoing paper was written by me several weeks ago, when in the country; but having now returned home and looked over the INTERNATIONAL STANDARDS, Cleveland *Plain Dealers*, letters and books accumulated by post during my absence, I find therein much that is both confirmatory of, and supplementary to, the general views arrived at. Thus:

(1) Mr. Astronomer Baxendell, of the Observatory, Southport, in England, shows in the important matter of the Pyramid's *versus* Modern Science's, sun-distance, that President Barnard both misquotes and misrepresents the numerical quantities already introduced into his pages, over and above leaving out others which ought to have been mentioned, with the effect of making white in so far appear black, and black white.

(2) The admirable papers of Rev. H. G. Wood, Sharon, Pa.; of Mr. C. Latimer, Mr. Dow, Mr. Beswick and other good writers on the *socket-defined* base-side lengths of the Great Pyramid in addition to and extension of the *pavement-surface* base-side length, make the total exclusion of the former from all mention by President Barnard more extraordinary than ever.

(3) A truly grand paper in mathematical physics by the learned Professor Pliny E. Chase, of Haverford College, Philadelphia, shows that the earth is the harmonic centre of condens-

ation for the harmonics of the whole solar system reaching even to the stars, by reason of its being the largest of the very dense planets, and from "its orbit traversing the secular centre of the belt of greatest condensation."

The mean density of the earth is therefore an affair not only of terrestrial but of cosmical importance, and is found, in the Great Pyramid metrology, to be worthily and appropriately introduced as the foundation of its system of measures of weight, while in the unfortunate French metrical system it has escaped notice altogether, and nothing but the density of water is referred to there, as though our solid globe of the earth consisted of nothing but water, and its inhabitants were fishes only.

(4) Finally the rapidly opening fortunes of the Anglo-Saxon race, trusting to God and itself, are admirably set forth in Lieutenant C. A. L. Totten's weighty and spirited book on metrology, dedicated to "The English-speaking Peoples of the Earth, who already possess the world's gates of commerce, who raise its food supply, lock up its surplus, and conduct its trade; who own its mines, coin its money, and control its industry; who invent its means of progress, cultivate its intellect, and elevate its religion; who tone its morals, liberate its inhabitants, and stem its tide of errors."

The reason of that remarkable outcome in this latter day is shown week by week in the *Banner of Israel*, (*i. e.*, the descendants of the ten tribes, not the Jews) to be due to the primeval promises of God to Abraham, and the commencement of the long appointed recovery of God's chosen people, who have been so long lost to the world, but who are now entering on the promised blessings, as Christians in heart and soul and missionaries of the Gospel of Christ our Lord.

C. P. S.

EDINBURGH, August 20, 1884.

THE IDENTITY OF THE ANGLO-SAXONS WITH
THE LOST TEN TRIBES OF ISRAEL.

In the illustration of this subject the design will be to show that the perfect fulfillment of the promises made to Abraham, to Isaac and to Jacob is found in the Anglo-Saxon race.

I. What are these promises? See Gen. xii, 1-3.—“Now the Lord had said unto Abram, get thee out of thy country, and from thy kindred and from thy father’s house, to a land that I will show thee. And I will make of thee a great nation, and I will bless thee, and make thy name great, . . . and in thee shall all families of the earth be blessed.” Gen. xvii, 1-8. —“And the Lord appeared to Abram and said unto him, I am the Almighty God; walk before me and be thou perfect. And I will make my covenant between me and thee and will multiply thee exceedingly. . . . For a father of many nations have I made thee: and I will make thee exceeding fruitful . . . and kings shall come out of thee. And I will establish my covenant between me and thee and thy seed after thee in their generations, for an everlasting covenant; and I will give unto thee and to thy seed after thee, the land wherein thou art a stranger, all the land of Canaan, for an everlasting possession. And I will be their God.” See also Gen. xviii, 18 and xxii, 15-18. To Isaac, Gen. xxvi, 3-4; to Jacob, the same promise, Gen. xxviii, 13-15; and the blessing of Joseph and his two sons, Gen. xlviii, 1-20.

II. The teaching of these promises.

1. The possession of the whole land of Canaan, as a perpetual inheritance, to the lineal descendants of Abraham.
2. An offspring as numerous as the sands of the seas, embracing many nations.
3. All nations of the world to be blessed through Israel.
4. Ephraim to become a multitude of nations, and Manasseh to become a great nation.

Where now shall we look for the fulfillment of these prom-

ises, not the fulfillment of *one* only, but of *all* of these promises, and that to the very letter? For if we cannot find such a fulfillment, where are we?—the Bible is but a fable, and God's word is proved false.

The history of the children of Israel is known to all readers of the Bible (for such only do we write) down to the exodus from Egypt, and thence through the wilderness to their entrance into the land of Canaan; their settlement in that land, under Joshua; the reign of the judges; the clamorous demand for a king; the anointing of Saul as the first king; the selection of David, the son of Jesse, as the king prefiguring Christ; and the reign of Solomon who builded the temple. Here ends the unity of the nation of Israel. At the death of Solomon his son Rehoboam comes to the throne. And the elders of Israel come to him and counsel with him as to some mode of relieving the nation from the great burden of taxes laid upon them by the building of the temple. But Rehoboam, preferring the counsel of the young men, rejected that of the elders. (See 1 Kings xii, 1-15). The result was the breaking asunder of the nation into two kingdoms, viz.: the kingdom of Judah, of two tribes, and the kingdom of Israel, of ten tribes; and the capital of Judah was Jerusalem; but the capital of Israel was Samaria, B. C. 980.

The history of these two kingdoms is found recorded in the first and second of Kings, and in Chronicles. The kingdom of Israel continued till the Assyrian captivity (B. C. 741) when a portion of the tribes were carried away by Tiglathpileser into Assyria. (See 2 Kings xv, 29, and 1 Chron. v, 6-26; Isa. ix, 1, next B. C. 721). The capital Samaria was besieged by Shalmaneser, and the whole kingdom was torn up and the tribes carried away to Assyria and placed in the cities of the Medes, on the river Gozan. (2 Kings xvii, 6-24, and xviii, 10-11). Here the kingdom of Israel becomes lost. The kingdom of Judah continues until the Babylonish captivity, about B. C. 588. (2 Kings xxiv, 10-16, and xxv, 8).

III. Let us now learn, if we can, what became of these ten tribes of Israel.

If the promise made to the patriarch is true, these tribes—

this nation of Israel—must still be in existence somewhere in the world, not bearing the name they had while in Canaan, for the prediction by the prophet was that they should “be known by another name, and by another language should they be addressed.” Their own identity they should lose, that “they shall abide many days without a king, without a prince, and without a sacrifice.” See Hosea iii, 4. It is commonly said that the ten tribes were carried away to Assyria, which, I think, is true, although a part of Dan and the tribe of Simeon seem to have escaped that captivity. Dan and Simeon both had their lots assigned to them on the southwest of Canaan, bordering on the Mediterranean sea. The tribe of Dan found, after a while, their lot becoming too small for them, and therefore a colony was formed, which removed from the old homestead and located at the extreme north of Canaan, near the foot of Lebanon. This colony we will leave for the present, but shall refer to them by and by.

The tribe of Dan, it is said, “abode in ships,” and when Solomon was building the temple Dan was employed in merchant service, and went in ships to Tarshish, in Spain, and thence around into England and Wales, for tin (and other things) which was used by Solomon in the sacred vessels of the temple service, B. C. 1005. Hence the country of Spain and of the islands of the sea were not unknown to Dan and Simeon.

Now, it is found that Dan and Simeon were neither of them disturbed by Shalmaneser, because the kingdom of Judah lay between Samaria and Dan; and Judah being at peace with Assyria, these two, Dan and Simeon, were not captured. But they, belonging to the kingdom of Israel, and their king, with all his army and the mass of the population, being carried away, and their capital being utterly destroyed, Dan and Simeon are said to have embarked in their ships and fled away to the islands in the northwest; and at length they landed, Dan on the north coast of Ireland and Simeon in Wales, where he has remained to the present day. Dan located in Ireland, where he at length organized a kingly government, about 700 B. C.

Let us now return to the other branch of Dan, in the north of Canaan. This branch of Dan seems to have been carried

captive to Assyria and placed on the river Gozan with the other tribes. But he seems not to have rested quietly there; his pioneering spirit soon began to manifest itself, and we find him wandering off north between the Caspian and the Black Seas; and wherever he camped for any length of time, there he left his name—"Dan." Hence the first principal river he crosses, the name Dan (now called Don) is given to it. Next we come to the river *Dan-iever*, then to the *Dan-iester*, next to the river *Dan-ube*, where a longer encampment was made; thence up the Danube, making temporary settlements only, until they finally landed in *Dan-emarke* (now Denmark). Here they spread out, occupying not only this state, but also Holland and Sweden, etc. At what date this settlement was made it is not definitely known, but it is believed it must have been B. C. at least one hundred years.

JEREMIAH GOES TO IRELAND.

At the time of the Babylonish captivity (see 2 Kin. 24: 10-16, and 25: 28, etc.) it is stated that Jeremiah, who had been imprisoned on account of his faithful preaching against the idolatry of the Jews, was ordered by Nebuchadnezzar to be taken up out of the miry pit, and liberty granted to go wherever he desired, and that his wants should all be met and assistance given him in performing his work. And now as the Jews had been defeated by the Babylonians, and their king Zedekiah taken, his sons slain, his own eyes put out, and all to be carried captive, Jeremiah is said to have gone into the temple, before it had been despoiled, and taken from thence the tablets of the law, Jacob's stone, and such other sacred things as he desired, together with the king's daughters who had been trusted to his care. All these, with Baruch and other attendants, after going down to Egypt, went all together away to Dan, in Ireland; on their way they were obliged to put into port in Spain to repair their vessel; and these two men are reported to have carried out from the ship a stone which was deposited on the ground safely, with other things from the vessel; and after repairs had been made these were all transferred back to the vessel. Thence they proceeded on their voyage, and were driven ashore in a storm on the north coast of Ireland.

Here Jeremiah found Dan to have organized a sort of kingly government, and the then reigning prince was Eöchaid II. This prince on beholding the princess daughter, of Zedekiah, was enamored with her beauty, and soon proposed an alliance. To this Jeremiah readily consented, but on this condition: that the government should be purged from all "Baalism," and the divine law as recorded on the tablets should become henceforth the constitution of the kingdom. To this requirement Eöchaid readily assented; and soon the marriage was consummated by Jeremiah, and Tephi (for that was the name of the princess) was crowned queen upon the sacred stone Jeremiah had brought with him, and the prophetic benediction given; that her and her offspring this stone should ever accompany; and every succeeding ruler should be crowned thereon. And it is positively declared, by the tradition of Ireland, that on this stone every ruler in Ireland was indeed crowned. Fergus the First took it over into Scotland, where it was used in the coronation of every ruler down to James the Sixth of Scotland—afterwards James I. of England, and thence to no Victoria, the last that was crowned thereon; and that this very stone is to-day in the coronal chair in Westminster Abbey.

In Ireland these traditions also state: that Tephi died after a few years, leaving a young family of children and Eöchaid to mourn her loss; that to Eöchaid this loss was almost unupportable, his love to her was so great; that he determined to build a great mausoleum at Tara, where their love had been plighted, and there erect a monument worthy of the memory of that queen, whom all the people adored no less than himself. In this grave, it is believed, were deposited the two tablets of the law, and the Ark that had from the first contained them. For it will be remembered that when the sacred vessels were taken from the temple by the Babylonians, every article was specified by name, but no mention whatever is made of the Ark of the Covenant. And so also, in the order from Cyrus to restore all the things taken by Nebuchadnezzar to the Jews, to be returned to Jerusalem for their temple, no mention is made of the Ark, although all other things were mentioned by name. So also Josephus specifies all the articles brought back

from Babylon to Jerusalem, but is silent as to the Ark. Now the Ark was known to have been in the temple at all times up to the Babylonish captivity, but the history of the world knows nothing of the locality of that sacred Ark from that time to this. Is it unreasonable, then, to believe that Jeremiah did actually take this Ark from the temple when he took the tables of stone? And is it reasonable to suppose "the tables of the law" would be taken from their sacred enclosure, and that enclosure be left empty and alone? And if this were so why was no mention made of it, either by the Babylonians or by Cyrus, or by Josephus? To me it seems most certain that the Ark and its sacred contents were never separated; and that this Ark, whose tables of stone had the law written thereon by the finger of God, cannot be lost, but that the same divine care that has watched over His people in all their wanderings, will surely bring to light this Ark of the Covenant. How can it be otherwise?

And I rejoice to know that I am not alone in this expectation. For already an effort is being made in England and Scotland to raise funds enough wherewith to purchase the "Hill of Tara," and there explore that mausoleum, that covers the dust of Queen Tephî, with the full hope of finding that long lost sacred Ark of the Covenant.

Let us now return to the tribes left in Assyria, on the river Gozan.

These tribes while remaining in Assyria were known by the several names of Cymri, Saxonæ, Angles, Jutes and Gauls. These several names have all been traced back into Palestine or Canaan, viz: Cymri is said to be none other than Samaria, the capital of the ten tribed Israel. Hence the names of a great many places where the Cymri dwelt, such as the Crimea of the Bosphorus; the Crimea of Gothland; Cambria in France; Cumberland in England, and the Cumries in Scotland. The name Saxon is said to be derived from the Hebrew term "Isaac," thence Saxæ, next Saxonæ, by which last term they were known at the time of their migration out of Assyria. So of all these other names.

Some fifty years ago the inquiry was raised in England as to

“Who are the Anglo-Saxons; where did they come from and who were their ancestors?” This inquiry Sharon Turner undertook to answer. After consulting all histories, both ancient and modern, within his reach, he began tracing them back over the route they had come from the East, until finally he brought up in Assyria, in the cities of the Medes, on the river Gozan, the very place where the Israelites were planted by Shalmaneser, who carried them captive from Samaria, their capital. Here he left them, because he could go no further, not knowing or even dreaming that he had thus “identified” the lost tribes of Israel, for the thought of their being such had, as yet, entered the head of no man living, much less his own. This work of Sharon Turner’s seems to have remained unnoticed until a recent date, when one and another, but especially Edward Hine in his investigations on this subject, found here the very key to the origin of the Anglo-Saxons; that they were indeed the “Lost Tribes of Israel.”

Now we find that some centuries B. C. these Anglo-Saxons, etc., began their migrations, and in all cases their movement was westward. Why was this? Why should they all, Dan, Simeon and all the rest, set their faces westward, and thus pursue their wanderings? Had there been given any divine command or any prophetic intimation directing them in this westward flight? No history, either sacred or profane, had at the time of their captivity uttered the first word of the future course to be pursued. But after their captivity the prophets Isaiah, Jeremiah and Ezekiel, together with all the minor prophets, proclaimed from the divine command that Israel was to be planted in the islands of the seas, in the far west and north; that there they were to rest; that during the time of their migration hither “The children of Israel shall abide many days without a king, and without a prince, and without a sacrifice,” but “afterward shall the children of Israel return and seek the Lord their God, and David their king; and shall fear the Lord and His goodness in the latter days.— Hosea iii: 4-5. And also, “I will sift you among all nations as corn is sifted, yet not a grain shall be lost.” These with many other similar predictions were uttered by the prophets

after Israel was carried away captive into Assyria, but no one of them had ever reached the ears of any one of the thousands of the captives of Israel in all their wanderings.

But the faithful covenant-keeping God who had promised Jacob "Though I make a full end of all nations whither I have driven you, yet not a hair of your head shall be lost." That faithful God, therefore, by an unseen hand, led his people in all their wanderings, as truly as he had led Abram long before to a land, he not knowing whither he went. So in like manner all these ten tribes of Israel were led, they knew not why nor whither, away to the islands of the western seas, "where they were to rest and be increased, till they had become a mighty people," and in the end all the promises made to the fathers should be literally fulfilled, and fulfilled in themselves the very children of Israel, the lost ten tribes! How wondrous are the ways of God; that amazing love, love unknown! When Christ came He said, "I am not sent but to the lost sheep of the house of Israel." And in giving charge to His disciples He said, "Go not into the way of the Gentiles, and into none of the cities of the Samaritans enter ye; but go rather to the lost sheep of the house of Israel." In obedience to this divine injunction, we find the apostles going their several ways to the very regions of country where these ten tribes were now wandering, viz: Pontus, Galatia, Cappadocia, Bithynia, Macedonia, etc. Here they were looking out from the northwest point of Asia into Europe, seeking the land of their rest. And thus they were led on until the Anglo-Saxons were planted in Germany, where they must abide for a season, known only to Him who led Israel in the exodus out of Egypt. But hitherto are they led without the loss of the least of their tribes.

THE ANGLO-SAXONS ENTER ENGLAND.

Now we have reached ground traversed by the historians of England, viz: Hume, Macaulay, Knight, etc. These all have to begin about A. D. 1, soon after the ingress of Julius Cæsar into England. The history of England it is not necessary to repeat until about A. D. 440, when the Anglo-Saxons were induced, from various considerations, to come over into England,

where some of their brethren had been for a long time, even from the first settlement of that country. For it is conceded by all that the original inhabitants of these islands were the Celts, the Gauls, the Picts, and Scots, etc. But who these various tribes were, the Anglo-Saxons were totally ignorant. Yet we have seen above that all these were none other than some of the very ten tribes. Here, then, the Anglo-Saxons came, and soon established the heptarchy—some say an ochtarchy—just agreeing with the number of tribes concealed away in their body. Yet they knew not what they did. They builded better than they knew.

Here they began to grow and to prosper, until about A. D. 800, when these petty kingdoms were all consolidated, and Egbert was crowned king of England. In this form the government was continued, in peace and apparent quietness, until the eruption of the Danes in their piratical invasion, which continued till in A. D. about 1030. But who were these Danes? Ah! they were none other than the descendants of Dan, whom we had traced in their migrations from Assyria through the north of Europe to their final settlement in Denmark.

But what is the next scene in the development of this divine but wondrous drama? At this time we find a kingdom of great power had grown up in Normandy (now France) which was stretching out its right hand about to seize the crown of England. Soon William the Conqueror, at the head of his mighty army, crossed over and landed in England, and at the battle of Hastings gained a complete victory, and thus capped the climax by placing the crown of England on his own head.

But this William the Conqueror, who is he, and whence his origin? Evidence seems to point in one way only—that these Normans were indeed the very tribe of Benjamin!

Here, then, we have assembled the ten tribes—yes, the eleven tribes, counting the tribe of Manasseh—as one. These possess England, Scotland, Wales and North Ireland. But not one of them all is found to have any knowledge of his own origin, or that of any of his neighbors. And here this people, under this government of Great Britain, continue to grow—“to lengthen

their cords and strengthen their stakes"—having never been conquered in battle, either by land or by sea, up to the present time, A. D. 1884.

FULFILLMENT OF PROPHECIES.—A FEW.

Concerning this subject, this may be said: that all the prophecies in the Bible, uttered by whomsoever or towards what people or kingdom soever, yet all have reference, directly or indirectly, to the fulfillment of the promises made by God to Abraham, Isaac and Jacob. Not a prophecy have I been able to find, after the most diligent search, which is not aimed at this end—*the building up of God's kingdom in this world*; for this is none other than the aim of those promises. Even the prophecies uttered against Egypt or Babylon, Assyria, Tyre or Moab, these all look to that very end, viz.: the fulfillment of the promise to the fathers; aside from this they have no meaning; but, this end in view, they are all full of meaning, even the most minute prediction; for God never utters a prediction of mere empty words, as man often does, words containing nothing (*vox et preterea nihil*). Bearing this in mind, let us look at some of the prophecies concerning His people Israel.

Gen. xxvii, 29.—“Let people serve thee, and nations bow down to thee.” This is a prophetic prediction uttered by one of the patriarchs himself in the very dawn of the kingdom of God; yet how manifestly this reaches out to the long distant nations, making them all tributary to this end. Again, “The nation and kingdom that will not serve thee shall perish; yea, those nations shall be utterly wasted.”—Isa. lx, 12. This threatening prediction is given concerning God's ancient people Israel. Every nation and people is to render service to Israel, but those that refuse shall be utterly destroyed. Many other like predictions might be cited, but these are sufficient to this point.

We will now turn to another class of prophecies. “Yet the number of the children of Israel shall be as the sand of the sea, which cannot be measured or numbered.”—Hosea i, 10. This prophecy was uttered about the time of the Assyrian captivity, when, to all human appearance, the whole nation of Israel

would soon become extinct. But that very people, "the kingdom of Israel," not Judah, have now become so numerous as to outnumber any other nationality in the world.

Deut. xxviii, 12.—"Thou shalt lend unto many nations, but thou shalt not borrow." Where is the people to whom this will apply? Can it be said of any of the nations of Europe, they lend to many, but borrow from none? Is this true of France? Who can answer? Of Spain? Alas, who does not know that Spain is bankrupt? So of all other governments on the continent, is there any one of whom it can be said, "they lend to many, and borrow from none?" Such a nation cannot be found. But in the islands of the sea, how is it? What saith England? Is it not known the world over that the wealth of England is so great that she alone of all the nations on this globe does actually "lend to many nations, but that she borrows from none?" Is not this, then, one case in evidence that the Anglo-Saxons are indeed God's own chosen Israel? Again it is said: "Thy seed shall possess the gate of his enemies."—Gen. xxii, 17. Where shall we look for the fulfillment of this prophecy? What nation can be found of whom it can, in truth, be said, he possesses the gate of his enemies? This is to have the entire control, for whoever possesses the entrance to one's palace has most surely the control of all within and about the palace; and that nation that holds possession of the *gate of his enemy*, how can it be that he has not the control of that enemy?

Now, England does, in fact, possess the gate of all her enemies the world over. But can this be said of any other nation of Europe, or of the entire world? Here, then, we have another case of the fulfillment of God's promises to Abraham, etc.

Again, it was promised to Abraham that in his seed all nations of the earth should be blessed. Now, this promise must embrace blessings both spiritual and temporal.

We have seen already that the Anglo-Saxons are indeed the seed of Abraham. Let us next learn what is true as to the blessings, of a temporal kind, bestowed by this people on the nations of the world. And here does it need the knowledge of all history to show that the chief blessings of civil and religious liberty now enjoyed throughout the world have been de-

rived mainly from the Anglo-Saxon race? And then more especially is this true as it regards spiritual blessings. But what are we to understand by the term "spiritual blessings?" The meaning which I apply to this term is: that system of religion taught in the Bible, as set forth in both the Old Testaments and in the New. What nation then, or people, have fulfilled the promise to Abraham in this particular? Let us see. Who are the missionaries that are now proclaiming, in all parts of the world, the great salvation? Who are they and whence do they come? All who are familiar with this subject know full well that the missionary spirit seemed to have had a direct and divine inspiration infused into this Anglo-Saxon race, both in England and in America, at a period early in the present century. Their missionary societies were formed first in England, afterwards in America, and from these two sources have sprung all the streams of missionary influence now blessing the world. And can any one point to a single missionary in any part of the world who was not sent out through this Anglo-Saxon influence? It has been objected, indeed, that several missionaries have gone out from Germany. Yes, but who are these? Did they not go from Saxony, the very home of the Anglo-Saxons? And was not Luther of the very marrow of the Anglo-Saxon race? Let him say nay who can. So of the Huguenots, can any one show, by any *probable* evidence, that they are not of the tribe of Benjamin, *i. e.*, of William the Conqueror's men? What, then, do we find? Is it not this: that the great company of preachers in all parts of the world are Anglo-Saxons, directly or indirectly? And these are unlike the missionaries of any other religious order in the world, in this: that they all carry an open Bible, thus distinguishing themselves from the Jesuit missionaries.

And now what about the Bible? The voice of the living preacher, though ever so eloquent, is soon lost in the silence of the air if he go alone and have not the oracles of God, the Bible, in his hand, and presented also to all his people. What, then, has this Anglo-Saxon race done with the Bible? First, they have not only sent each and every missionary with a Bible in his hand, and charged the same to make these Bible teach-

ings known the world around, but they have translated this blessed book into all the principal languages of the world, and then printed and sent abroad, like the leaves of the forest, so that to-day there is not a nation or tribe known on the face of the earth now destitute of a copy of the Bible.

Again, in Deut. vi, 7-9, it is enjoined to God's people Israel: "Thou shalt teach them diligently to thy children, and shalt talk of them when thou sittest in thine house; and when thou walkest by the way, and when thou liest down, and when thou risest up. . . . And thou shalt write them upon the posts of thy house, and on thy gates."

Now, this has been done *literally* by the Anglo-Saxon race, wherever found, whether in England or in America, or in the islands of the seas afar off in the remotest parts of the world. But what other peoples have done this? Does the history of the world give any clue to the name of such a people? Has not this case, then, some showing that the Anglo-Saxons are the identical Israel of God? What can be more evident? If any one can tell, let him speak.

THE BLESSING OF JOSEPH'S SONS BY JACOB.

The closing scene of Jacob's life—one of the most beautiful ever recorded—is contained in the 48th and 49th chapters of Genesis. This whole account I recommend to careful perusal by every one who desires to get a thorough understanding of the prophetic predictions uttered by Jacob, under the divine inspiration then given him. The special topic to which our attention shall now be directed is the blessing Jacob gave to the two sons of Joseph.

When about to die, Jacob called for these sons of Joseph that he might bless them. And Joseph approached his Father, bringing his two sons, placing Manasseh, the elder, at Jacob's right hand, and Ephraim at his left hand, that each might receive the blessing according to his age, the right of primogeniture belonging to the elder son. But Jacob, stretching out his hands, crosses them, and places his right hand on the head of Ephraim. But this displeases Joseph, who lifts up his father's hand, saying at the same time, "*this* is the older." "I know

it, my son ; I know it," says Jacob. Then he pronounces the blessing. First, "that they shall *grow* to a multitude in the midst of the earth." This term *grow* is rendered in the margin of the Bible, *as fishes do increase*, spawning by the millions. Then he pronounces the blessing that Manasseh shall become a great nation, but not like Ephraim. Ephraim's seed shall "become a multitude of nations." Here, then, we have the blessing stated definitely that Manasseh should "become a great people," but Ephraim "a multitude of nations." Is it possible now to find the fulfillment of these predictions—not something approximating toward a probable fulfillment, for these cases admit of nothing but the most exact and literal fulfillment? Let us see then how the case stands. What are the facts?

These two sons, Ephraim and Manasseh, we have found to be dwelling with the Anglo-Saxons ; that with them they came into England ; that there they have gained a permanent residence, and that these Anglo-Saxons are none other than the lost tribes of Israel. We find, also, that "Ephraim" is often used as "Israel" by the prophets, and particularly in Ezekiel xxxvii, 15-20, where Ephraim is declared to stand for the head of the house of Israel, to lead Judah back to Jerusalem.

Ephraim, then, represents the head of the English nation. What, now, has England, *i. e.*, the government of Great Britain, to show as meeting the conditions of Jacob's prophecy?

First, there is the home government of Great Britain ; next there is Canada, a large nation of several millions ; then the West India Islands is another ; then crossing over the Atlantic to the west coast of Africa is another assemblage of colonies, making a government ; proceeding on to South Africa, there we find two large nationalities ; from here we sail into the south seas, where we find Australia, Tasmania and New Zealand, three large nationalities ; thence we take our flight northward to India, where we find more than two hundred millions of people, embracing eleven (some say sixteen) distinct nationalities, all recognizing the government of Great Britain, and Victoria as their Empress. Then, still further, islands of the Pacific hold other settlements of Anglo-Saxons, so that historians now

tell us that the British government has, within the bounds of its empire, sixty different colonies—nationalities of people.

Now, what have any or all the governments of Europe got to show on this subject as an offset to this exhibition of Great Britain? Let us see.

France has her home government, and once held by her forts much of the country from the Gulf of St. Lawrence to the Gulf of Mexico. But where are these possessions now? Alas, they have long since been absorbed by Ephraim.

Well, Spain; what of her? Spain once extended her sway over the entire continent of North and South America, and had her colonies planted from one end to the other. But where are they now? All have vanished like bubbles on the ocean's wave.

Italy, then, from the great iron Roman empire, what of her? Ah, Italy indeed, she is herself but just born, and that out of the smoldering dust of old Rome. She has nothing but her own infantile self. So of all the other governments of Europe is there one that can show a single item, claiming to the fulfillment of the promise made to Ephraim! But in the government of Great Britain we have found that she has grown, literally, into "a multitude of nations." Now, it may be asked with confidence, is it possible to specify the wanting of the least thing as a failure to the fulfillment of Ephraim's blessing, even to the crossing of a *t*, or the dotting of an *i*? If so, let that be shown? If, then, a prophecy is fulfilled to the very letter, a prophecy in which is wrapped up the great blessings of the world, for which we have long been praying, though we knew not why, need we hesitate when we find the veriest fulfillment of the prophecy staring us fully in the face—need we hesitate to receive it? Alas, this only can be from our blindness—our weak faith—our want of confidence in the certain fulfillment of God's word, that He will fulfill to the very letter all his promises. For He says, "If the ordinance of night and day shall fail, then shall my promise to Israel fail of its accomplishment." No, the trouble is, we have so long been accustomed to the spiritual interpretations of all the promises made concerning Israel, the nation of Israel I mean, notwithstanding the repeated assertions of God himself to the

contrary, that we stagger and hesitate when we see the fulfillment palpably before our eyes. As for myself I can conceive of no more, I can ask for no more perfect fulfillment of the promised blessing made to Ephraim than is here shown to be found in the government of Great Britain.

Manasseh, can we find a like fulfillment of the prophecy made to him.

In examining the prophecies made to these two sons of Joseph, we observe a marked difference; the one was to "grow into a multitude of nations," the other was to be confined to one nation, yet its greatness unlimited. With this destination in mind we will proceed.

It will be remembered by all who are familiar with the history of England, that Wycliffe published a translation of the Bible in English about A. D. 1380. This was received and read with absorbing interest; that about 1526 A. D. Tyndall published his more perfect translation, which was grasped by the multitude as the very manna from heaven. The reading of this work produced what were called the Puritans. This edition of the Bible was soon confiscated by the Papal power which then held sway in England, and Tyndall himself put to death. But the seed thus sown could not die here. Henry VIII., then at war with the Pope, soon published a small edition of the Bible, about three hundred copies if I am not mistaken, all of which he distributed to the various parishes, to be chained in the chancel of the churches, to be read by any one who desired to do so. After this Elizabeth published the "Bishop's Bible," which gave an increase in the circulation of the Scriptures. But this only prepared the way for the publishing of "King James' Bible," which is our present copy of the Scriptures. On this translation there was no prohibition; and hence the Bible was studied with the intensest thought. The Puritans, therefore, became more numerous, Cromwell among the rest; and A. D. 1620 a company of about one hundred and three was formed, and put into a little vessel called the "Mayflower," which was started out to sea, its course being directed by some unseen hand, till at length this little band were landed on Plymouth Rock in the dead of winter.

Who could have devised such a plan? Surely, no human wisdom would have risked its reputation in such a scheme! But in all this movement there stood a wiser counsellor than earth affords. Here was to be planted the germ of that "great nation" predicted by Jacob to Manasseh.

Let us see then what became of that little band of Pilgrims. Why, the first winter buried the half of them in death! This certainly does not look much like the "growing into a mighty nation." But "God's ways are not always man's ways, neither are His thoughts our thoughts." Here this germ, this little branch, taken from the tree of Liberty in England, is transplanted in a virgin soil, where it has unlimited power of growth, and "none to molest or make afraid." And what do we find to-day? Here we see what the world can show the like of nowhere else. This little germ, almost killed by the first winter's frosts, has sprouted up, and grown and grown until its branches now reach from the Atlantic to the Pacific, and its roots extend throughout all the land from the North to the South! This tree of Liberty, the cynosure of all nations, why are such multitudes flocking hither? Who can tell? Let him answer who can. This whole affair—what is it but a perfect enigma to human view? But looking through the divine telescope all darkness flees away, and the very stars of the last magnitude stand out with minute distinctness. Yes! God is fulfilling His promises. He is not dead, neither has He forgotten His covenant. His faithfulness shall not fail till every jot and tittle of all He has promised to Israel, by the mouth of all His prophets, shall be accomplished.

Here, then, in America, we find the conditions of the promise made to Manasseh fulfilled to the very letter. And if they are not here, where shall we look? In what part of the world to find their fulfillment? Or where shall the man be found that will undertake, either by his own wisdom, or the wisdom of all the world combined, to delineate a more perfect fulfillment of Manasseh's promise?

NEBUCHADNEZZAR'S DREAM.

In Daniel ii. is the account of a wonderful dream had by the king, and which greatly troubled him. And having lost the

true outline of the dream, the king summoned all the astrologers and soothsayers, demanding of them to make known to him both the dream and the interpretation thereof. And this must be done or death should be their portion. On the approach of the officer to whom this business was entrusted, Daniel inquired, "Why is the king so hasty?" giving the officer to understand that he could, by the divine aid, answer the king's demand.

The result was that Daniel was brought before the king, and there told the king his dream, specifying its minutest appearance; and afterward its interpretation. The dream was the appearance of a great image, whose head was gold, its breast and arms were silver, its belly and its thighs of brass, its legs of iron, its feet of part iron and part clay. Then a stone cut out without hands, smote the image on the feet and broke them to pieces. Then this whole image became like the chaff of the threshing floor, scattered and found no more, and the stone became a great mountain and filled the world.

The interpretation of the dream, says Daniel, is this: "Thou, Nebuchadnezzar, art this head of gold. After thee shall another kingdom, inferior, come; a third of brass, which shall bear rule over all the earth. And the fourth kingdom shall be strong as iron, . . . and shall break in pieces and bruise; and the toes of the feet, part of iron and part of clay; the kingdom shall be partly strong and partly broken. . . . And in the days of these kings shall the God of heaven set up a kingdom, which shall never be destroyed; and this kingdom shall not be left to other people, but it shall break in pieces and consume all these kingdoms, and it shall stand forever. "For as much as thou sawest that the stone was cut out of the mountain without hands, and that it break in pieces the iron, the clay, the brass, the silver and the gold, the great God hath made known to the king what shall come to pass hereafter, and the dream is certain and the interpretation thereof sure."

Here we have an outline, given by divine inspiration, of what is to transpire, down to the end of time. And the explanation of this dream is given in such terms as to have secured the entire consent of commentators in nearly every particular.

All agree that the Babylonish kingdom represents the head of gold; that the Medo-Persian kingdom represents the arms and breast of silver; that the Grecian kingdom, under Alexander, the brass; and that the Roman kingdom, in its kingly and its imperial form, represents the iron. But strange as it now may seem, the mass of commentators have given to the stone a different meaning than what is given to the other parts of the great image. All these parts, from the head to the feet, represent kingdoms, *i. e.*, nations of peoples. Why, then, should the stone be taken to represent Christ, as it has been by multitudes? Does not Daniel say expressly that this stone represents a kingdom (of peoples) which the God of heaven will set up in those days, and that this kingdom will not be left to other peoples, but it shall stand forever? What can be more evident than that the stone represents a kingdom of human beings (of peoples) the same as the other kingdoms? To me, indeed, it seems most evident; the only difference there is being in the character of this people constituting this stone kingdom.

Where now shall we look for a people whom the God of heaven shall set up as His kingdom and which shall stand forever, consuming all other kingdoms represented by the great image? Has God a chosen people, a peculiar people, separated from all the peoples of the world, and which people he calls His own? Has He not said that this people shall not be destroyed, that though he should make an end of all nations among which He would scatter his people, yet he would not make a full end of Israel, but Israel should continue His own distinct people to the end of time, and that this very people were to become, in the latter day, like the sands of the sea "which cannot be measured nor numbered?" All this He has declared by the mouth of His many prophets, over and over again, and confirmed all with His own infallible oath, that the heavens and the earth should perish, yet not one jot or tittle of His word should fail." What can be stronger than this? What can be conceived more sure and everlasting?

There must be some nation of peoples now somewhere to answer to this stone kingdom which the God of heaven was to

set up "in those days." But that people must be His own people, and not some strange or unknown people.

Now it has been proved above, if it is possible to prove anything respecting the fulfillment of prophecies, that the Anglo-Saxon race are indeed the identical descendants of the lost ten tribes of Israel. If this has not been proved, then nothing can be proved. If so, how can it be proved that such a person as Abraham ever lived, or Isaac, or Jacob, or Moses, or David, or Solomon, or any other person mentioned in the Scriptures, even Jesus Christ himself?

Now, I think it can be shown conclusively that the government of Great Britain, the English speaking people, is the very nation represented by the stone.

At the time of the migration of the Anglo-Saxons into England, about A. D. 440, there was established a heptarchy, some say an octarchy, *i. e.*, petty governments ruled by chiefs, in number equal to the numbers of tribes then concealed in that Anglo-Saxon body. Yet this was known to no one of their number at the time, for they had lost all knowledge of their own identity in every respect; but they builded better than they knew, and thus under the divine guidance—the same that led Israel out of Egypt and in the wilderness—they here laid the foundations of a government that is to stand forever. Under this heptarchy they began to grow, until A. D. 800 these seven little kingdoms were all amalgamated into one kingdom, and the crown placed upon the head of Egbert, the first king. From this little germ that nation has been growing, slowly at first but increasing with the lapse of time, growing with greater strength as time advances. Indeed, historians tell us that, unlike all other nations of Europe, England has never been conquered in battle, either by sea or land, up to the present time!! And to-day England is "at the head and not at the tail of all nations;" that she (the Anglo-Saxon race) is permeating all the nations of the world by her influence, and that her sixty colonies do now girdle the world.

Where, then, can we put down our finger and say, here is a point wanting its fulfillment on God's kingdom of stone? Indeed, is it possible to find any, the least iota, which has not

its literal fulfillment in the stone kingdom up to this time? The end is not yet.

Let us now review the ground we have gone over, and ascertain, if possible, what we have found :

1. First, we have found that God made a covenant promise with our fathers, Abraham, Isaac and Jacob, by which He secured to them and to their posterity (*a*) the everlasting possession of the whole land of Canaan, extending from the river of Egypt even unto the great river Euphrates.

(*b.*) A progeny numerous, beyond computation, which was to pervade all nations.

(*c.*) A race of kings reaching down to the end of time.

(*d.*) That all nations of the world were to be blessed in, and through this Israelitish nation.

(*e.*) And finally that he would never leave nor forsake His people till he had accomplished, to the minutest article, everything promised in the covenant.

2. We have found, in our examination of the divine providences towards His people, that Israel was led, in all things, under the direction of that promise, down to Egypt, thence out of Egypt, through the wilderness, into the land of Canaan, the country of their inheritance ; that here every tribe had its lot assigned, and this lot was occupied in accordance with the divine decree ; that here the nation began to take root and become great, first under Joshua, then under Judges 400 years. At length they demanded a king, like other nations, which was given them, Saul being the one selected as their king. The successors to Saul were David, and next Solomon, who builded the Temple, God's House ; that after Solomon came Rehoboam his son, under whose reign the kingdom was broken in two, and hence became two nations—viz., the nation of Judah, formed of the two tribes, Judah and Levi, which is from this time called the Kingdom of Judah. The other of ten tribes, was called the kingdom of Israel, whose capital was Samaria, but Judah's capital was Jerusalem.

These two kingdoms continued, each in its separate existence, till A. D. 724 (about), when the kingdom of Israel, on account of its great idolatry, was besieged by the Assyrian king ; their

capital was destroyed, and the nation captured and carried away to Assyria, and placed in the cities of the Medes, on the river Gozan. Here they were "Lost." Lost to the world, but not to God.

3. Next, we have found these ten tribes, that constituted the kingdom of Israel, all located in the isles of the sea, in the far N. W., according to the prophetic predictions. First, Dan to Simeon, whom we found to have been acquainted with the country, by employment under Solomon, in transporting tin, etc., from England in A. D. 1,000; these, Dan and Simeon, took ships and sailed away to Ireland, Dan locating on the North of Ireland, and Simeon settling in Wales.

4. The other branch of Dan, we found to have wandered off from Assyria, leaving his name at every encampment he made, till his final settlement in Denmark.

5. Next, we found the tribes that were still in Assyria had received the name and were called Anglo-Saxons while there. And that these tribes were conducted by an unseen hand first, into Germany, next into England, where they became permanently located, and where they established the heptarchy, A. D. 500. And about A. D. 800 these governments were all united under one head, and Egbert was crowned their king.

6. Finally, "William the Conqueror," the leader of the tribe of Benjamin, comes in from Normandy, and at the battle of Hastings is crowned king of the ten tribes, all congregated here in the English Government, called now, and for long time to come, the Anglo-Saxons.

7. We have found the promise of Jacob to the two sons of Joseph literally fulfilled—viz., that Ephraim was to become a multitude of nations, and Manasseh a great nation, Ephraim's promise is found to be literally fulfilled in the government of Great Britain, with her sixty colonies; while Manasseh stands equally crowned in the United States of America.

8. And, again, we have found all the nations of the world being now blessed, politically, financially and religiously. Hence, we find that the interpretation of Nebuchadnezzar's dream has its perfect fulfillment in the government of Great Britain, or rather in the Anglo-Saxon race.

Here then we reach the final conclusion, and find, in every particular, embracing every iota, the promise made to the fathers, and the prophecies uttered by the prophets concerning lost Israel.

What now shall we do with this exposition? Shall we receive it or not? Indeed, what more can be asked? What more can be conceived? Have not the promises, the prophetic predictions, been all verified up to this time? Can anyone specify the least thing, and say, this has not been fulfilled? Indeed, the fulfillment in all things is so marked that the world may be challenged to write out a more exact fulfillment of these prophecies up to the present time than we have found actually to have taken place in our review.

As to the future we are not anxious to enquire, and we will not speculate, for the history of the world shows that all such speculation is vain, for no one knows how God will fulfill his promises. Is it not most manifest that of all those who have written upon the fulfillment of future prophecies, not one has hit the nail on the head. The actual fulfillment not being what the theory supposed it would be! How foolish, then, to speculate on the fulfillment of future prophecies.

There are many prophecies yet to be fulfilled, such as this, Isa. xi: 11, "And it shall come to pass in that day that the Lord shall set his hand again the second time to recover the remnant of His people," etc. But when He will do this, or by what agencies it is to be accomplished, He has not told us.

Also, the great battle of Armageddon, or Gog and Magog, we are assured shall be fought, and the utter defeat of God's enemies is predicted; but the exact time of this battle, or how it is to be engineered by the commander of the diabolical hosts, God has not revealed to man—only the certainty of the event. So also He has promised, Jer. xxxi: 31-35: "Behold the days come, saith the Lord, that I will make a new covenant with the house of Israel, and with the house of Judah. . . . I will put my law in their inward parts, and write it in their hearts. . . . And they shall teach no more every man his brother, saying 'know the Lord,' for they shall all know me from the least to the greatest of them, saith the Lord; for

I will forgive their iniquity, and I will remember their sin no more ! ”

Now, this promise has certainly not yet been fulfilled. But the time is coming when it shall be fulfilled to the very letter ; but when the exact time, or how this is to be accomplished, we know not, only we are assured that God is to be the chief actor in this wonderful drama.

What wonderful events, then, seem about to break upon the world ! These many and great prophecies which stand struggling for admission at the very door ! But which of all these shall enter first, or how long shall be the time of its fulfillment, who can tell ? Then, when these shall have been accomplished, what next ? Ah, what but the glorious appearing of the Great Lord, our Saviour, Jesus Christ, even in that very form He went away with, vanishing from the gaze of His disciples ! Even so, “ come Lord Jesus, come quickly.”

E. P. INGERSOLL.

June, 1884, A. D.

THE SPHINX.

This well known monument ranks next to the Pyramid, not only in location but in interest; and yet theory has so far failed to cover its mysteries, and research has been lost in the clouds of sand that overwhelm both fact and fancy, while poetry in terming this monster "a watcher at a tomb" has shown her usual indifference to truth. The Pyramid, which it watches, being only a "tomb" in so far as it is a type of a resurrection, holding within itself a revelation. There is no need to say here that this "revelation" is already lighting the path of knowledge on which many are running to and fro.

What, then, is this mystery that, unlike its solemn neighbor, has no voice but in its outward form? Of what is it typical? Does it tell of past or future? Does it commemorate an era, or does the cartouch of a king confine its history to the life of one human being? If I may be pardoned for a repetition of what is already known, the collection of facts will aid in the formation of an opinion on the subject.

Its form has, until recently, been considered as a union of a woman and a lion. As now partly visible above the sand, the giant head gives little indication of either. The face is mutilated, the nose is said to be in the Berlin Museum, the beard has fallen off, the serene beauty of which we have heard is lost among the attacks of friends and enemies, and late travellers irreverently compare it to some nondescript animal. It is pathetic in its helpless ruin and in its powerless protest against the cruel sand. Let us try to imagine it as it appeared to the worshippers of Horus, and judge whether it was not worthy to have been designed by the same great architect who planned the Pyramid, and a monument of the same race of builders.

One of the earlier travellers (Belzoni in 1815-'19) found traces of a pavement which he thought surrounded the Pyramid, and on which, he says, were erected the three great monuments to

which he ascribes the same date. These are the largest Pyramid, the Temple on the east side, and the Sphinx on the extreme southeastern edge of the platform or pavement. This pavement is strangely spoken of in "J. E. Perring's Report" (1839) as having been "discovered by Colonel Howard Vyse, while endeavoring to find the lower entrance passage to the subterraneous apartment, in which, according to Herodotus, the body of Cheops was deposited on an island surrounded by the waters of the Nile." Perring says the pavement is 1 foot 9 inches in thickness, and extended in the centre 33 feet 6 inches beyond the original base, but at the excavations eastward and westward of the centre it was not more than 12 or 13 feet wide. The stones he says are "carefully and beautifully fitted together."

This measurement would not admit of the Sphinx being upon the pavement, but that can only be decided by those who have examined it in reference to the settlement of this question. He also says that the plane at the base of the rock on which the pyramids of Gizeh stand was probably cultivated, but from the accumulation of sand from the desert it is now above the reach of the annual inundation of the Nile. This I quote from what Professor Symth terms "that excellent, though unwieldy and seldom consulted folio of enormous plates," which lies open before me, and which I have vainly examined to determine the exact distance of the Sphinx from the Pyramid. Whether this monument is or is not on the pavement, it certainly is on the same rock as the pyramids, and this is stated to be 150 feet above the desert level. Its position indicates a reference to the Pyramid, being—according to Perring's survey—placed diagonally from its southeast corner, facing east, and stretching out its huge paws towards the Nile. In the 'History of Egypt,' by Samuel Thorpe, the author says of this "lion with a man's head, there were probably two of these monsters, one on each side of the Pyramid, and probably of the same age of the Pyramid they were intended to ornament." If another existed, or was projected, on the northeast corner, their connection with the pyramid idea would be proved, and the approach from the Nile would be something unsurpassed in magnificence. What:

this approach was we can imagine by the aid of Captain Caviglia, or accept with the reproduction of gorgeous ceremonial as described by the Rev. J. H. Ingraham in his 'Israel in Bondage,' a book not recognized by scholars as he hoped it would be, and yet a work resulting from the study and research of the same authorities to which we must resort. His magnificent description is too long to quote. The immediate approach to the Sphinx was excavated by Captain Caviglia. He found a sloping descent of 135 feet cut in the rock, ending in a flight of 13 steps to a level platform, from which another flight of 13 steps led down to the temple which was placed between the fore paws. This descending approach heightened the impression of the magnitude of the Sphinx as it appeared to rise before the spectator. From the platform on which the feet rested to the top of the head was 62 feet, the extent of the paws 50 feet, and the whole length of the body 140. Kenrick says the whole body is excavated, except part of the back and the fore paws, which are covered with hewn stone; others assert that the whole figure is formed of hewn stones, and they discover the cement which joins them; this again is denied by those who see the veins of the rock in the apparent lines of cement. M. Maillot considers these lines as natural and not cement. Probably the fact is that the rock was used as far as possible, its deficiencies being made up by stone-work. In a note on the few words in which Herodotus dismisses the Sphinx, Savary says: "Opposite the second pyramid is the Sphinx, the whole body of which is buried in the sand; it is of a single stone, being part of the rock on which the pyramid stands." Ingraham states that it was made by a king of the oldest dynasty, who chiselled into these grand proportions a mass of rock which, projecting from the Lybian hills, nearly obstructed the view of the largest pyramid. He also speaks of it as "an andro-sphinx," crowned with a helmet, on which the sacred serpent was affixed, and as having "a great and full beard," and as being a deification of Chephres. In the description of Egypt, taken from the account of M. Maillot, French Consul at Cairo, 1735, we read, "This union of the head of a virgin (fille) with the body of a lion, so common among the representations that one

meets in Egypt, was a symbol of that which is known in this country under the signs of Virgo and Leo."

This, according to the consul, is the annual inundation of the river Nile, and the fertilization of the soil by the action of the sun's rays upon the saturated earth, rendering Egypt fertile and habitable. "The kings of Egypt," he says, "knowing no better way to acknowledge to the sun their reverence for him as the author of their felicity, they consecrate to him this mysterious figure." The elder Pliny (book 36) says the Sphinx was looked upon as a divinity by the people, who said that King Harmais was buried in it, and that it was brought from a distance. He is, however, so very disrespectful to the pyramids that his testimony is not fully reliable. Of these gigantic monuments he says: "They are so many idle and frivolous pieces of ostentation of their resources on the part of the monarchs of Egypt." He asserts, however, that the Sphinx was hewn from a solid rock, and the face colored red, from a feeling of veneration. The circumference of the head around the forehead is given as 102 feet, and the height from the body to the top of the asp, or the summit of the head, as 62 feet. He does not speak of the mutilation of the nose, and we may hope that important feature was adding dignity to the face when he was there. The asp certainly was, and that was a part of the ornament of what is described as a crown or helmet. Wilkinson says (vol. 2, page 334) that "the allegorical connection between the Sphinx and the monarch is pointed out by its having the kingly beard as well as the crown and other symbols of royalty." This beard seems to have been discovered by Captain Caviglia, who revealed the magnificent approach. Sir Howard Vyse says (vol. 3, page 109): "Captain Caviglia discovered fragments of stone, on which was represented plaited hair. On seeing them I was led to imagine them parts of a beard, or at least of that singular appendage denominated a beard, and frequently attached to the chins of male personages in Egyptian sculpture." Wilkinson explains the forms of these appendages ('Ancient Egypt,' vol 2, page 332): "The most singular custom of these Egyptians was that of tying a false beard under the chin; it was made of plaited hair and of a peculiar form,

according to the person by whom it was worn. Private individuals had a small beard scarcely two inches long; that of a king was of considerable length, square at the end, while the figures of gods were distinguished by its turning up at the end. No man ventured to assume or to affix to his image the beard of a deity, but after his death it was permitted to substitute this divine emblem on the statues of kings, and of all others who were judged worthy of admittance to the elysium of futurity, in consequence of their having assumed the character of Osiris, to whom the souls of the pure returned after leaving their earthly abode." The beard of the Sphinx (probably a later addition) according to the same author, and as before stated, indicates a king. This may, however, be called in question, and future discoveries reveal the turned up end, which would place our monster in the role of deities. Whatever be the shape of his or her beard, the greatest amount of testimony is in favor of the divinity of the Sphinx, or of its final deification. That it was an object of worship at some period is as nearly certain as anything that depends on testimony. Kenrick says: "A Sphinx is a representation of the monarch whose name it bears;" but Mariette Bey (in his Catalogue, page 270) quite reverses this decision in his description of one of the Sphinxes in the museum at Cairo, which does not bear the cartouch of the king who made it. He says: "By a sort of usurpation of which examples abound, these sovereigns successively ornamented this monument of San with their legends. These were Apappos, a shepherd king; Mèneptah, who put his inscription partly over that of Apappos; and Psousennis; so that the date of a Sphinx cannot be decided by a cartouche with any more certainty than the name of its builder, as the first king who appropriated it may have had no more right than the last." Pliny spoke of the red color of the face; this indicates a sacred purpose, as Pausanias, quoted by Sir Howard Vyse, says that in Egypt and in India this color was so applied. Diodorus speaks of a sacred book being inscribed in red characters, and says that its writers wore red dresses. Professor Smyth and Sir Howard Vyse speak of hieroglyphics on the Sphinx, but Kenrick says there were none on any part of it. They may

have been on the tablets found with the small temple between the fore legs of the Sphinx. This temple was probably a later erection, when the original design of the monument was not clearly comprehended. In a history of Egypt by Samuel Thorpe the temple is said to have been built by Thothmosis IV., and that his figure was represented within the temple worshipping the Sphinx. The name Sphinx in ancient dialects means "the pouring out." It is not, however, the only name by which this monument is known. Bel-hit is the most significant, and means "the Lord who cometh." Hor-em-Khon is another, meaning "the sun on the horizon," or "in his resting place," while the modern name is Abou-houl, "the father of sand,"

From these fragmentary testimonies we learn that this many-named monument, which presents to the eye a union of a human figure with that of a lion, traditionally symbolized certain blessings which something in that union brought to the earth. To the Egyptians the greatest blessings were derived from the inundation of the Nile, which begins at the summer solstice. The name Sphinx—which means "the pouring out"—(Maz-zaroth)—holds this idea. The inundation not only represented to them the submerging of the desert and the material good in its restoration to fertility, but also the religious idea of the conquest of Typhon, the desert (or evil) by Osiris, the Nile (or good). We also find that this monument became an object of worship, divine honors being paid to it, and that it afterwards represented a deified king (perhaps from such national expression of feeling as placed Napoleon among the stars as Orion the Conqueror). Our interest is in the idea which may have originated the monster. A "monster" because the Egyptians and early builders indicated the importance of a thought by the ponderousness of its representation. Therefore in its size, as well as in its form and in its worship, we must seek the thought that underlies its erection.

Let us suppose the Sphinx to have been erected at, or near, the Pyramid date, and to have been designed by its builders—whom we believe were divinely endowed with a wisdom above that of the people whom they had conquered. Let us also

remember that the pure religion of the Shepherd Kings had the same origin as that of the Egyptian idolators, both religions claiming a Noetic and Sethite source, and that it was in a certain degree astrological, although preserved from the lower forms of worship which turned the stars to deities, gave them human parts and passions, and bowed to the created instead of to the Creator. In proof of common astrological expressions, note the prophecy of Balaam, "a star out of Jacob, and sceptre out of Israel." A star is the Egyptian hieroglyph of a god, and a sceptre, of a king. So that both Israel and Egypt could read the coming of a god-king. Therefore if the Sphinx were erected by the Pyramid builders, the design may have been to symbolize a pure religious truth, although afterwards this very truth may have been desecrated by the later Egyptian mind without being entirely lost. Let us suppose this design was to symbolize an important era and to typify a future period of good. To prove this true it must combine all that Egypt has ever revered in this mysterious and solemn creature. We will examine it. The symbolical thought is the past era of the creation of the present race of men, with the promise of redemption under a coming king, and the typical thought is the future fulfillment of the promise in the reign of the king, who meanwhile conquers a peace. The Sphinx would then be an Alpha and Omega of the Pyramid thought. An Alpha in that it symbolizes the beginning of the earth's history in its week of work; an Omega in that it typifies the conquest of evil and the reign of the Lion of Judah in the earth's final Sabbath.

Taking the accepted era of this creation (I mean the completed preparation of the earth for the abode of the then created man) 4000 B. C., we find many traditions that it took place at the summer solstice. We learn that the sun at that date was at the junction of the constellations Leo and Virgo, where the bright star Denebola marks this junction. The word Denebola means the "lord or judge who cometh quickly"—(Mazzaroth), and corresponds to Bel-hit, which means "the lord who cometh," and is one of the most ancient names of the Sphinx. The commemorative monument would then unite the two

zodiacal signs of Leo and Virgo. "The Lord," who is represented by the type of the sun, is leaving Leo, the place of his kingly power, and entering Virgo on a period of humiliation, then passing through the twelve stages of redemptive work, returns finally to the glory of the king in Leo, and in his passage through that typical constellation proclaims himself the conqueror of the serpent, the bringer of all blessings, the Lion of Judah, the Omega. (Mythologically we have the Hercules, astronomically the sun in his yearly course, religiously the God-King, the Virgin born.) The rising of the Nile at the period of the summer solstice, is a sign of the conquest of evil and of the blessings of fertility conferred on the earth, through the power of the Hor-em-Khon, "the sun in his resting place." Would it then be a thought unworthy of the Pyramid builders to place before their great conservatory of truth a symbol of the sun's place at that creation, and to show in it the prophecy of a Christ without whom creation would be a curse?

We are here met by the difficult fact that the head of the Sphinx is that of a king, not even of the crowned woman of the skies, still less of the Virgin. This is susceptible of two explanations. One is to leave out the constellation of Virgo altogether, and consider the Sphinx as representing only the Lion King of Judah. This would be satisfactory were it not that the woman appears traditionally in the Sphinx, and that the Greeks, who must have had some reason for it, represent their Sphinx always as uniting a woman and a lion. To reconcile these two ideas, we consider Virgo as symbolically the mother of humanity in being the mother of a divine son in whom humanity is represented as "neither male nor female, but one in Christ Jesus." If this is objected to, the constellation Virgo may represent the humiliation of the king who humbled himself to be born of a virgin, and this humiliation he represented by the man-headed lion seated immovably upon the earth.

If the Sphinx marked this year, let us read the figurative story by the position of the sun at the solstitial and equinoctial points. To Christ leaving His kingly power in Leo, and entering the constellation of Virgo, is given the longest day.

His work has dawned upon the earth. An era, a year-day has begun. The Hor-em-Khon, "the sun in his resting place," or "on the horizon," indicates rest in the work of creation, and progress in the beginning of a new day.

To the Holy Spirit, as figured by Aquarius, pouring out the water upon the multitude of fishes—represented by Pisces—is given the shortest day, his work being then subordinate to that of Christ.

The autumnal equinox prefiguring the approaching winter of death, would be at the union of Scorpio and Sagittarius. The arrow of the archer pointing to the red star, Antares—the wounding—in the head of the serpent.

The vernal equinox, the period of hope, would be between Taurus and Gemini. The sun leaving the court of glory gathered around Al Cyone—the centre—and travelling onward to the long day of the triumph of Judah's Lion.

This year, 4,000 B. C., is worthy of commemoration. It was well done to place a symbol in imperishable stone to await the dawn of the "Day of the Lord," to gaze, unmoved by friend or foe on the daily typical wonder of the rising sun.

In further confirmation of the commemoration of this era, we find its record on some ancient Egyptian zodiacs. The zodiac of Erni places the summer solstice between Leo and Virgo, and the winter solstice between Aquarius and Pisces. At the sign Virgo is placed the crowned Sphinx, over a serpent of the venomous species, with a flat head. (Mazzaroth, page 23.)

In the planisphere of Dendara, the lion is also over a serpent, but it is not of a venomous kind, having a pointed head, and therefore may represent the sun's course; a dove is also combined in the sign, the Virgin is holding a branch, but a female figure in the explanatory decan holds a child. The summer solstice is represented as being at this place by a figure holding a vase, thus representing the inundation of the Nile. To the Egyptian mind the summer solstice and the inundation were inseparable. The place of the winter solstice is marked in Aquarius by a headless horse, its well known type, so that there is little doubt that this planisphere commemorates this year. (Certain changes and indications in this planisphere sug-

gest it having been altered for a horoscope. This would not invalidate the original design in Mazzaróth, page 16.)

There is another New Year's day, still more wonderful, commemorated by the Sphinx. It is that of the *Annus Magnus*, the ending of which will be in the far-off ages when olams on olams shall have passed. The opening of that year would tell the same star story that has been already read, but in the progressive record of its passing months the changing position of the colures tell us that "night unto night showeth knowledge, there is no speech where their voice hath not been heard, into all the earth hath their line gone forth and to the end of the world their sayings." (Young's version.) The length of this cycle is variously given. By H. Gratten Guinness it is computed at 25,847 years, and an interesting calculation made which proves the present length of human life to equal one day of this great year. ('Approaching End of the Age,' p. 552.) There is no need to explain the precession of the equinoxes to our readers, but it may not have occurred to them to note the progressive revelation of the changing colures. Many nations have celebrated this year by the feast of the *Taurobilium*, our May day. Maurice says: "I have little doubt that May day, or the day on which the sun entered Taurus, has been immemorially kept as a sacred feast from the creation of the earth and man, and was originally intended as a memorial of that auspicious period." Other traditions tell us that at sometime in the antediluvian days the colures were marked by the stars: Al Debaran, the governor; Regulus, the treading under foot; Antares, the wounding, and Tom-al-Taut, the mouth of the fish. The colures had then receded from the entrance of the constellations to the positions of these stars, long known as Royal Stars. Another tradition tells of a feast which, like the *Taurobilium*, we still observe, was the *Criobilium*. This must have commemorated the entrance of the sun at the vernal equinox into the constellation Aries, the Ram. April fool's day is said to mark this change, the event probably being a surprise to the early astronomers, and the custom of sending on fools' errands told how often they had watched for the coming of the sun among the

stars of Taurus till at last they were obliged to acknowledge the fact that the equinox had receded to the next constellation. In India and Persia the first of April is the beginning of the year, and the festival of the new year is celebrated with great magnificence. We have now reached a period of this cycle in which the vernal equinox is in Pisces, the autumnal in Virgo, the summer solstice in Gemini and the winter in Sagittarius. The Sphinx still calmly watches the passing years, and may read the world's history thus:

The Vernal Equinox is the time of hope, of renewed life. The sun is at that time in the constellation Pisces, a word meaning fish, multiplying, and from the same root as the word fish in that wonderful prophecy of Ezekiel, xlvi: 9—"Everything that moveth whithersoever the rivers shall come shall live, and there shall be a great multitude of fish." This is called the healing of the Dead Sea, and "two rivers" are said, in the margin, to flow into it. In the hemisphere of Dendara, Aquarius is passing two streams, the waters of life for the fish. Does the Sphinx read the mystery that the period has begun when many shall be restored to life by the blessings of these rivers? The prophetic vision reads: "Everything shall live whither the river cometh," and that the fish shall be "exceeding many."

The summer solstice, the longest day, is now in Gemini; the sign which I read as that of Benjamin and Joseph, the two sons of the beloved Rachel. The word Gemini—*twins*—may have been adopted from similarity of sound with the name Benjamin or Ben-jemini (1 Sam., ix, 1, margin). What story will the Sphinx tell us, if not that the day has begun for the blessing of the Son of righteousness upon the divided house of Israel. Some of the stars in Gemini tell of union. One, translated from the Coptic (Mazzaroth) means "the station of the wayfaring men;" another means "the coming." Will not this age see the return of the "wayfarers," Israel's wanderers? They have the longest day, and it is *now*. The autumnal equinox is in Virgo. The humiliation is nearly over. Christ's mediatorial work is drawing to the end.

The winter solstice is in Sagittarius. This is the shortest

day, for the work of the archer is done—the dragon is wounded, we need no long day to tell that story. The explanatory decana of that constellation tell of the wounding in Draco; of the finished work in Arai; of the coming triumph in the Eagh and Lyra, for its brightest star, *Vega* (destined sometime to be the pole star) reads: “He shall be exalted.”

Month after month of this passing year the Sphinx watches. The letters of golden light write the revelation. Have we not failed to note the correspondence of the star-written story with the revelation of the *Book*? Shall the Sphinx only, in his long rest, have time to understand how “the heavens declare the glory of God, and the firmament showeth His handiwork?” When Kepler established his third law he exclaimed: “God has waited six thousand years for an observer.”

Let the Sphinx teach us a lesson; it is the same the Master taught—*watch*.

E. BEDELL BENJAMIN.

WHAT SHALL BE THE UNIT OF MEASURE?

AN EARTH-COMMENSURABLE UNIT BEYOND THE REACH OF HUMAN SKILL.

The methods of geodesy, or earth measuring, in their present advanced state are a marvel of human attainment in making and using instruments of precision, in eliminating errors of observation, and in determining the form and size of the earth. The measuring of angles to the small fraction of a second, and of lines many miles long to within one-millionth of their length, the ascertaining of latitude and longitude to the nicety of inches, and the running of levels across mountains and through them, the tunnels being worked from both ends and meeting accurately in the middle, and even the measuring of the earth's polar diameter within a probable error of a thousand feet,—these are a few of the modern achievements in geodesy.

But every advance in skill and science has been the means

of detecting new difficulties to be overcome before we can determine the precise form and size of the earth. Formerly the earth was believed to be a sphere, and its form certainly is so nearly spherical that its shadow seen upon the moon during an eclipse appears to our eyes to be perfectly circular. Later, the pendulum was found to beat slightly faster in high latitudes than in low, and this, with other indications, led to the conclusion that the earth is not exactly a sphere, but is spheroidal. Then many arcs of meridian were very carefully measured, and discrepancies were found in the results which could only be explained by admitting the earth to be ellipsoidal; that is, it is not only compressed from a circular form in its polar section, but also, in a less degree, in its equatorial section. Now, the ellipsoid is suspected to be slightly ovaloidal, the large end of the egg being at the south pole; but if ovaloidal, the forces which are believed to have produced this form are still at work, and are slowly changing with the precessional period, so that by and by the small end of the egg may become the large end.

Then again, close observations, many times repeated, and the most delicate experiments have combined to lead to the conclusion that the earth is not evenly balanced, nor strictly elliptical in either its polar or equatorial section, and its form is now described as *geoidal*,—that is, earth shape. (Scientists have the fashion of saying: "I do not know," in Greek;—it is easier to make confession in an unknown tongue.)

Before this geoidal shape can be formulated, we must be able to calculate the effects of volcanic and other plutonic forces which, within historic times, have very sensibly changed the topography of large areas of the earth's surface. The isthmus of Suez, for illustration, has been tilted so that the Mediterranean sea has encroached upon its northern side, ruining some of the old towns there; while, on the other hand, what is now the southern shore of the isthmus was once covered by the waters of the Red sea. The coast of Chili is several feet higher above the ocean level than at the commencement of this century; the coast of Greenland is settling. We might add almost indefinitely to the known list of chang-

ing levels, some of them extending over vast areas; but, very probably, the changes which we do not detect may far exceed those which have been observed.

If we may accept the opinion of most geologists, the earth was once a molten mass, which has been cooling and solidifying for thousands of ages, and still continues the process, causing constant shrinkage and warping of the crust. In the former molten state the earth was demonstrably spheroidal through the action of centrifugal and centripetal forces, though daily distorted by tides. But since that time, according to Mallet (see *Encyc. Brit.* article, *Geology*), the earth has shrunk, in cooling, not less than 189 miles of its diameter; and who can calculate the warpage since the earth's crust began to wrinkle into mountains, and hills, and valleys, and ocean beds; to bulge into elevated plains as in Central Asia, or to sink into vast depressions like the Great Desert of Africa? Perhaps areas, either of depression, or of elevation, may surround and include the poles of the earth. Perhaps the earth may now be gradually yet sensibly changing its polar diameter, by a changing of level like that observed on the coast of Greenland; or a more rapid change may come at any time, as on the coast of Chili; or if the earth gradually and slightly changes its axis, as astronomers suspect, that very movement, since the earth is not a sphere, would almost necessarily change the measure of the axis.

Then we may ask concerning winds and waves, sunshine and rain, electricity and chemical forces: who shall estimate the inconceivable power of these forces, or the measure of their effects upon the form of the earth?

In view of all these difficulties and disturbances, how can we expect ever precisely to determine the form and size of the earth? As Prof. Merriman, in 'Figure of the Earth,' says, "Years and centuries must roll away before sufficient data shall have accumulated to render a theoretical discussion satisfactory in its results." President Barnard, in the same despondent tone, says that the earth's polar axis is "unknown"—that is, it is not known to sufficient accuracy to be taken as a practical standard of linear measure.

The great problem of geodesy remains unsolved, and is proved to be unsolvable. Hence an earth-commensurable unit of measure cannot now be, nor ever could have been devised by mere human skill. A unit adjusted to the much ridiculed standard of three barley corns in length, if that length has been successfully laid off on a suitable metal bar and is preserved as a standard of measure, is quite as dignified a standard as a platinum bar which tried to be—but everybody knows is not—the $\frac{1}{100000000}$ of the earth's quadrant of meridian.

A perfect cosmic unit of measure, if such ever existed, must have had divine origin, "For vain is the help of man."

A DIVINELY REVEALED UNIT OF MEASURE IS PROBABLE.

May we reasonably hope to find a record of a divinely given unit of measure?

We do not expect to receive by revelation any truth which lies within human grasp, but if we believe in revelation at all, we must believe that it makes known every fact essential for man to know, which otherwise would lie beyond his reach. The question of a revealed unit of measure may then be narrowed down to this: have we the record in the Bible of any commands imposed by God, at any time, upon any people, or individuals, which would necessitate their use of exact measures?

We find in the Bible three notable instances in which God gave commands which required work to be made of specified dimensions. The first of these commands was given to Noah: "Make thee an ark of gopher wood." . . . "And this is the fashion which thou shalt make it of: the length of the ark shall be three hundred cubits, the breadth of it sixty cubits, and the height of it thirty cubits," &c. . . . "Thus did Noah; according to all that God commanded him, so did he."—(Gen. 5th chapter).

The next notable instance recorded is that of Moses, with whom God "communed" upon Mount Sinai during the forty days and forty nights of that wonderful interview in which Moses was showed the pattern of the tabernacle which he was to build. And a little later, "Moses was admonished of God when he was about to make the tabernacle; for see, saith he,

that thou make all things according to the pattern shewed to thee in the mount." . . . "According to all that the Lord commanded Moses, so the children of Israel made all the work. And Moses did look upon all the work, and behold, they had done it as the Lord had commanded, even so had they done it: and Moses blessed them."—(See Exodus, chapters 25 to 40).

Again, we read concerning the building of the temple: "Then David gave to Solomon, his son, the pattern of the porch and of the houses thereof." . . . [Then follow the details.] "And the pattern of all that he had by the Spirit." . . . "All this, said David, the Lord made me understand in writing by his hand upon me, even all the works of this pattern."—(1 Chron. xxviii, 12-20).

The ark was built by Noah according to directions and dimensions given to him by the Lord; the tabernacle and all its appointments were made by the Israelites, according "in all things" to the pattern which God gave in completeness of detail to Moses in the mount; the temple was built by Solomon, after the specifications which were revealed "in writing" to David, his father, "by the Spirit." In view of the explicitness of the plans and dimensions, and the strictness of the command to obey them, are we not almost compelled to infer that the unit of measure—the cubit—by which God gave the dimensions, was exactly defined in length, either by reference to one already established standard cubit, or by the revelation of a new standard? In either case its length must have been exactly communicated by God to Noah and Moses and David, or, which is equivalent, communicated directly to Noah and transmitted by him, through a fixed standard, to Moses and David.

In further confirmation of this theory we read that divers weights and measures were forbidden the Israelites, and they were enjoined, "Ye shall do no unrighteousness in judgment, in meteyard, in weight, or in measure. Just balances, just weights, a just ephah, and a just hin shall ye have."—(Lev. xix, 35-36). Now, all political experience teaches that a law enjoining just weights and measures would be a dead letter if there were no government standard of weights and measures; and we may be sure the Theocracy would not commit the blun-

der to proclaim a law without providing the means for its fulfillment. Indeed, a Theocratic form of government, destitute of a standard of weight and measure, seems an absurdity.

But, happily, the Scriptures clearly prove that the standard cubit was preserved unchanged for centuries in the most holy place, first of the tabernacle and afterwards of the temple. For the Lord said to Moses in the mount: "And they shall make an ark of shittim wood; two cubits and a half shall be the length thereof, and a cubit and a half the breadth thereof, and a cubit and a half the height thereof. And thou shalt overlay it with pure gold, within and without shalt thou overlay it, and shalt make upon it a crown of gold around about."—(Ex. xxv, 10, and following). "And the work was made by Bezaleel, the son of Uri, of the tribe of Judah, whom the Lord had appointed and endowed with wisdom and skill for the work. "And Moses did look upon all the work, and behold, they had done it, as the Lord had commanded, even so had they done it."

This same ark was deposited, centuries after this, in Solomon's temple; as we read, "And the priests brought in the ark of the covenant of the Lord unto his place, to the oracle of the house, into the most holy place, even under the wings of the cherubim." "And there (say the Chronicles) it remains unto this day." (2 Chron. 5th chapter.)

The ark of the covenant, then, the workmanship of the divinely appointed Bezaleel, made according to all that the Lord commanded Moses, and deposited in a place so sacred that none but the High Priest dare enter; was, in its cubit dimensions, a fixed and permanent standard of Hebrew linear measure. We have sufficient proof, however, that the Israelites had in common use other measures which they derived from the nations around them; but the use of strange weights and measures was but characteristic of a people who were prone even to worship strange gods.

Since God gave the Israelites a standard of measure, which they deposited as he directed, and kept unchanged for centuries, only losing it at last through their disobedience, we have strong reason to believe that the once revealed dimension is still in some safe repository providentially saved for the use of re-

stored Israel, though the Mosaic ark may have been destroyed. And since a divinely given standard unit would have permanent intrinsic value, superior to that of any other unit of measure, therefore, the cubit given to Noah was, without doubt, of the exact length of the cubit delivered to the Israelites; and Noah, or one of his sons saved with him in the ark, may have been inspired to perform the very work which would transmit the cubit of the ark, not only to Moses, but to the latest generation of men, just as Moses, by divine commission, transmitted the cubit of the ark of the covenant to David.

There is, then, strong probability that we may yet find a record of a divinely given unit of measure, which shall exactly restore to us the standard of Noah, and Moses, and David.

THE DEPOSITORY.

A standard measure of length cannot be preserved by a mere written description; the distance must be laid off on some durable and unchanging substance. Where, then, is a fit depository of that anciently revealed Noachian unit of measure,—some structure which dates back to the lifetime of Noah,*—exact in workmanship,—pure for divine use,—accessible to Moses,—and preserved to this day?

We claim that the Great Pyramid of Egypt is the only structure upon the face of the earth which fulfills all these conditions. It was for 170 years (Usher's chronology) cotemporary with Noah, who, we read, lived for 350 years after the flood; its workmanship is acknowledged to be exquisite; the idol temples of Egypt were closed during all the years in which it was building, and, though it is surrounded with marks of the grossest idolatry, it is itself free from taint; it stands in the birth-land of Moses, who, as heir apparent to the throne of Egypt, had access to it, and knew the measures by which it was built, for "Moses was learned in all the wisdom of the Egyptians;" and, though marred and disfigured with age and violence, it yet retains enough of its original perfection to yield to us the secret of

* The lost ark of the covenant, if recovered, would not fill the gap between Noah and Moses; we must, therefore, seek a more ancient repository of measure than the Mosaic ark.

its primeval weights and measures, and the proof, if any it possesses, of divine authority.

The theory of John Taylor, that the Great Pyramid is a divinely ordained depository of weights and measures, we must conclude, then, is very strongly supported by the prior argument of probability. Now, let the confirmation of that theory rest upon the testimony which we may obtain from the Pyramid itself.

A mass of evidence has been obtained from the Pyramid in late years confirmatory of its high scientific character, astronomical, geometrical, geographical and historical; but this article will discuss only a single line of these discoveries (the one most familiar to the writer) with the purpose of finding the unit of measure deposited there. And,

1. The most prominent characteristic of the Great Pyramid is the ratio of its height to its perimeter, which is as radius to the circumference of a circle. This chief prominence of the π ratio demonstrates that its supreme importance to science was understood by the architect.

2. The dimensions of the ante-chamber and king's chamber, as measured by Professor Smyth, the great advocate of the Taylor theory, and confirmed by W. M. F. Petrie, the most thorough and energetic opponent of this theory, repeat the declaration of the exterior of the Pyramid that π is supreme in mathematics, as may be seen by the following partial list of dimensions :

	British Inches.			
	Smyth.	Petrie.	π Formulæ.	
Whole length of ante-chamber floor,	116.37	116.3	$\frac{648}{\pi\sqrt{\pi}}$	= 116.372457+
Length of granite in floor of ante-chamber,	103.13	103.2	$\frac{324}{\pi}$	= 103.132403+
Length of king's chamber,	412.54	412.56	$\frac{1296}{\pi}$	= 412.529612+
Width of king's chamber,	206.26	206.35	$\frac{648}{\pi}$	= 206.264806+
Height from floor ("1st height"),	230.61	230.15	$\frac{324\sqrt{5}}{\pi}$	= 230.611064+
Height from base of wall ("2d height")	235.58	235.26	$\frac{648-1296}{\pi}$	= 235.470388-
Total,	1304.50	1303.82		1304.380730±

Also, the exterior dimensions of the Pyramid, as formulated by

their ratio to interior dimensions, and compared with Smyth and Petrie, are:

	Smyth's Estimate.	*Petrie's Measure.	π Formulæ	Value.
Height of Pyramid,	5818.+	5818.6±	$\frac{32400}{\pi \sqrt{\pi}}$	5818.622870+
Length of base side,	9140.	9139.8±	$\frac{16200}{\sqrt{\pi}}$	9139.8712581+

3. The integral numbers of the ante-chamber and king's chamber dimensions, when expressed in tenths of the king's chamber width, $\frac{648''}{10 \pi} = 20.6'' +$ (which is given in Haswell's and other tables as the value of the Memphis cubit), show that the builders of the Pyramid worked by this cubit. (See "The Proportions of the King's Chamber." By W. H. Searles, Vol. I, No. 1, Magazine.)

4. Each side wall of the king's chamber, with its perimeter of 1206 inches, and its length diametral to the perimeter, or $\frac{1206}{\pi}$, represents, on a scale of $\frac{1}{1000}$, a circle whose circumference measures one British inch for each second of arc, and whose radius is 10,000 cubits, thus correlating the cubit and the inch by means of the $360^\circ (= 1296000''$ circle) and π . (See "The Perimeter of the Side Walls of King's Chamber," p. 240, Vol. ii, Magazine.)

The prominence of π upon the exterior of the Pyramid is maintained in the interior chiefly by the British inch, which tells of an invisible circle surrounding every line.† Yet the cubit is the plainer revealer of the 3, 4 and 5 triangle,‡ and it interprets the π ratios of dimensions as perfectly as the inch, and hence puts itself in tacit dependence on π , and in harmony with the inch.

Two striking characteristics of the Pyramid must here be noted: first, the absence of a single full visible circle anywhere, either within or without; and second, the equally obvious pres-

*Calculated by the ordinary methods of trigonometry, from Petrie's data, assuming the true base of the Pyramid to be at the floor level of the S. E. socket.

† Notice that the average of π values is between the average of Smyth's measures and the average of Petrie's, as is proved by the footing up of the columns; showing that the π formulæ agree with Smyth and Petrie within the probable plus or minus error of each. (For a fuller list of π formulæ, and their geometrical relations to each other, see "The Argument Condensed," vol. 1, No. 1, of Magazine.)

‡ See the article by W. H. Searles, before referred to, "The Proportions of the King's Chamber," Vol. I, No. 1, Magazine.

ence everywhere of the symbolized circle, both within and without; for every π formula or π ratio of dimensions, intimates a circle.

The duplex measures of the Pyramid, the cubit and the inch, correlated with the circle through π , form a perfect allegory of the Bible. The unseen yet recognized circle whose circumference is a line without end, represents the unspoken yet everywhere recognized name of Jehovah, the omnipresent and eternal God the Father. The π , by whose aid alone the circle is found in the Pyramid, and which is like the circle in its infinity ($3.1415926535 +$ *ad infinitum*), symbolizes the Son of God.

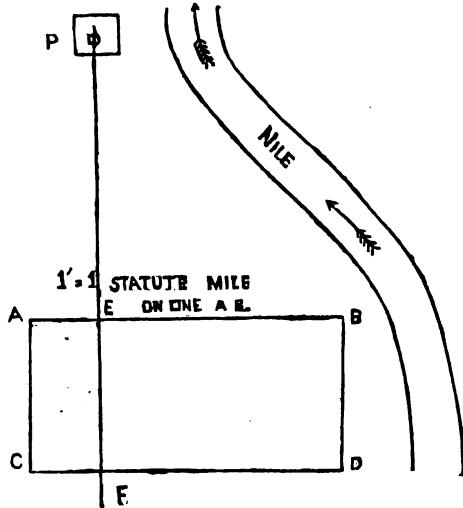
How perfectly these symbols paraphrase the 'saying of our Saviour, "No man hath seen God at any time; the only begotten Son, which is in the bosom of the Father, he hath declared him."

The cubit, which so plainly sets forth the right angled triangle, and the inch, which everywhere publishes π , are symbolical; the one symbolizes the Old Testament dispensation of law, by which every person's life was tested as with a try-square; the other symbolizes the New Testament dispensation of the gospel, which proclaims Christ to the whole world as our Mediator. As the old dispensation has been superseded by the new, so the cubit has given place to the inch; and just as the inch is chiefly instrumental in revealing the invisible circles of the Pyramid, so the Anglo-Saxon race, who have inherited the inch, are chiefly instrumental in the missionary work of spreading the knowledge of God, through Jesus Christ, in every nation.

THE CIRCLE OF THE EARTH WHENCE ANGLO-SAXON MEASURES MAY BE (WERE?) DERIVED.

The testimony of the Pyramid in favor of British measures is not yet exhausted. The 1296000 inch circle is typified on the side walls of the king's chamber on a scale of $\frac{1}{1000}$. If now we consider the whole Pyramid to be on the scale of $\frac{1}{1000}$ we may imagine its plan view to be enlarged 1,000 times, and a rectangle 1,000 times the size of the king's chamber floor to be laid off upon the land south of the Pyramid.

The plot of the proposed survey would be somewhat like the diagram, in which the small square P represents the Pyramid, the dot in its centre marking the axis, and the small rectangle within the square denoting the floor of the king's chamber.



within the square denoting the floor of the king's chamber. The site of the enlarged rectangle is shown at ABCD; it lies wholly upon the west side of the Nile, which here runs in a northwesterly course until about opposite the Pyramid, where it bends to the north. (See atlas accompanying *Description de l'Égypte*, 26 vols. In Cleveland Public Library.) The meridian distance PE will measure $4\frac{1}{4}$ to $5\frac{1}{4}$ miles according to the position in which a test survey shall locate the axis of the Pyramid,* and the distance PF will be $7\frac{1}{2}$ to $8\frac{1}{2}$ miles. AB measures $412529 +$ inches = about $6\frac{1}{2}$ miles, and AC, $206264 +$ inches = about $3\frac{1}{4}$ miles.

Now it is a fact, according to Prof. Stockwell, that the parallel of latitude in which the British statute mile equals one minute of longitude, lies from 5 to 8 miles south of the Pyramid. No one can calculate the exact location of that parallel from present data, for the reason, as shown in the first part of this paper,

*Prof. Smyth places the axis about in line with the overhanging top of the south wall of the grand gallery, and due north from the coffer, but Petrie locates it in line with the north edge of the great step.

that no one knows the exact size or form of the earth. Our general knowledge of these is accurate enough to assure us in locating the parallel as somewhere between the north and south boundaries of the rectangle ABCD, and we cannot with entire certainty be much more definite than this. Yet, as we shall see, a special survey of that rectangle might determine almost exactly where it is crossed by the parallel of latitude whose arc between AC and BD measures one British mile to each minute.

The Pyramid here offers an exceedingly delicate test of the theoretical length of its inch, for its axis will yet be located with great precision. Probably the formula will be found which will determine its exact distance from the king's chamber. When that shall have been done, the rectangle ABCD may be laid off from the Pyramid within the tenth of an inch of its theoretical position, while the enormous variation of *three miles* would change the inch by only $\frac{1}{2000}$ of its length; for, to near approximation, cosine of latitude CD : cosine of latitude AB :: length of one minute of arc on CD : length of one minute of arc on AB :: .867331 : .866897 :: 1.0005 : 1 :: the inch derived from the parallel CD : the inch derived from the parallel AB.

The rectangle ABCD offers peculiar advantages for geodesic work. An instrument placed at C, for instance, and adjusted to the meridian, will sight an object on the line AB about 100 inches east of the point A, because of the convergence of meridians, and each inch at this distance of 206264 + inches from the instrument of observation will measure one second of azimuth.—May not the azimuth of a very small arc be read off more accurately from a distant base line than from the limb of the instrument?

If an instrument should be placed at A and sighted to C, it would point slightly east of south; if another instrument were placed at B and cited to D, it would point slightly west of south. Let instruments so adjusted be turned upwards, and each note the time of transit of the same equatorial star; the instrument at the eastern station, B, would note the transit slightly *after* the star had passed the meridian of B, but the

instrument at the western station would note the transit slightly *before* the star would reach the meridian of A, so that the star would cross the line of each instrument almost simultaneously.—May not the principle of simultaneous transit, observed from a measured rectangle, suggest the most accurate method of measuring an arc of longitude?

The north side, AB, of this rectangle possesses such peculiar advantages for a base line for geodesic work, and coincides with such accuracy to the minute-mile ($1' = 1$ mile, or 5,280 feet) circle of latitude, that it may be taken to mark the circle of the earth whence Anglo-Saxon measures are derived. The modern British inch varies at most but very slightly from the $\frac{1}{83333}$ (the number of inches in the statute mile), of one minute of arc on the line AB, and it is possible that the overruling Providence which has guarded it for these 4,000 years may have guided modern legislation to an exact restoration of its primitive length.

The earth standard to which the unit of measure in the Great Pyramid thus appears to refer itself, if divinely ordered, is doubtless cosmical, but in what respect does not yet appear. But whatever the import, or whatever the intent of the Pyramid architect may have been, if the topography of the land indicated by the rectangle ABCD is favorable for accurate survey (of which I am not sure), and the geological formation is suitable for permanent monumental work, then the parallel of latitude passing through the base-line, AB, within the limits of the arc AB, would be a perfectly feasible standard line of earth reference for our system of measures, whereas the use of quadrants of meridian of the earth, which differ in length, or the earth's polar diameter, which we cannot measure with sufficient accuracy, are entirely impracticable.

If our investigation were to stop here we should be led to decide that the cubit of Noah and Moses and David, the cubit of the two arks—the ark by which the human family was kept from extinction at the time of the flood and the Mosaic ark of the covenant—was the 20.6+ inches cubit by which the Pyramid was built. This seems to be the natural inference from our argument, and we might not be without the support

of authority if we were to assume the Mosaic cubit to be 20.6 inches. Yet, such may not be the necessary conclusion, as is proved in a letter just received from Rev. H. G. Wood, in which he shows that other measures as well as the 20.6 cubit and the inch are correlated through π with the 1296000 second-inch circle. Perhaps the so called sacred cubit of about five times five inches may be among the correlatives, and superior to all others, and divine appointment may have made it commensurable with the earth's polar diameter at a specific date. But these things are not yet proved, and so, for the present at least, our inch is the safe, the satisfactory, the earth-referable, the pure unit of measure, the emblem of Christianity, and we ought to keep it until it shall have fulfilled its period and announced its successor. At some future time, however, we may correct the inch if we shall prove it to have deviated in the least from its primeval value.

J. H. Dow.

STRUCTURE OF THE BASE.

This article will bring our review of Mr. Petrie's recently published work ('Pyramids and Temples of Gizeh') to a termination. We propose in this article to generalize a little, and give a clear and candid statement of our own theory of the general form and structure of the base from our own data, as the result of our very extensive calculations and researches, and a thorough consideration of all that has been written by Prof. Piazza Smyth, Vyse, French Expedition, and the recent work of Mr. W. F. Petrie, and Pyramid literature in general. In the previous papers of this review we have scrupulously kept to our work of reviewing Petrie, accepting and testing his data, and endeavoring to explain his facts, as set forth by himself, by giving them the most probable interpretation. And this motive has led us to put forth a number of theories, based on his own facts, of the structure of the Pyramid's base. In the following article we propose to set forth our own conception of the original base, untrammelled by Petrie's theories or explanations,

as the result of our long and unwearied researches on this theme. We have kept our mind open to everything that has been urged in favor of and against the so called Pyramid theories, and we have given due weight to all that has been said by friend and foe alike. We have not pinned our faith to anybody's teaching, but have done our own reading, thinking and investigating. Our researches have been conducted *de novo*, as if nothing had ever been done by anyone, and the theory we now propose to set forth is unbiased and free from every taint of prejudice.

Mr. Petrie opens out his exposition, on page 37, by citing the materials available for a discussion of the original size of the base of the Great Pyramid: (1) "The casing *in situ* upon the pavement, in the middle of each face; (2) the rock-cut sockets at each corner; (3) the levels of the pavement and sockets, and (4) the mean planes of the present core masonry." He then proceeds to notice that, "On reducing these observations to give the mean form of the core planes at the pavement level, it came out thus:

	Core Plane Sides.	Socket Sides.
N.	9002.3	9129.8
E.	8999.4	9130.8
S.	9001.7	9123.9
W.	<u>9002.5</u>	<u>9119.2</u>
Mean	9001.5	9125.9
Mean difference	1.0	4.4 "

Mr. Petrie comments on this result as follows: "Here, then, was another apparently unaccountable fact, namely, that the core masonry was far more accurate in its form than the socket square. It is, in fact, four times (4.4 times) as accurate in length, and eight times (20" against 162") as accurate in angle. This forced me to the conclusion that the socket lines cannot show the finished base of the Pyramid."

"The clue which explains all these difficulties is—that the socket corners vary from a true square in proportion to their depth below the pavement, the sockets nearer the centre being higher."

“ This means that the sockets were cut to receive the foot of the sloping face, which was continued right down to their floors, beneath the pavement. (See Plate XI.) ”

“ Hence the sockets only show the size of the Pyramid, where it was started from varying levels, which were all *under* the pavement ; and its true base *upon* the pavement is therefore 26 or 30 inches inside the lines of the sockets. ”

We have given Mr. Petrie's theory in his own words ; and it is the most synoptical and comprehensive statement of his whole theory, of the structure of the base, to be found in his work. It will be seen from this statement that the pivotal idea in this theory is the location of the sockets. Their varying levels are the result of the unevenness of the rocky floor or foundation. The socket corners, he says, do not give a true square, the sides from socket to socket being longer and shorter according as the sockets are nearer the centre. The sockets nearest the centre have the shortest diagonals and the shortest sides to their square. We think it cannot be disputed that almost every measurer of the Pyramid's socket distances has acknowledged this leading fact, that the distances from one socket corner to another are not all exactly alike, nor are any two distances exactly the same. A fair and candid statement of this leading fact is demanded from every one who undertakes to write upon this subject, or to set forth any theory of the structure of the base and the length of its sides.

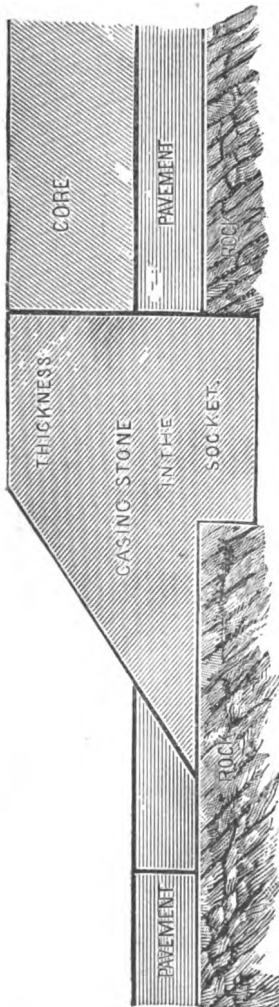
The pivotal idea in any theory must be the location of the socket corners and their significance. Any explanation of the structure and size of the base would be worthless in the end, without a true theory of the location and significance of the sockets.

THEORY OF THE SOCKETS.

We begin, then, with a theory of the sockets. We say it candidly, but we say ~~it~~ modestly, that the common and popular theory of the sockets is erroneous and misleading. It has been the fruitful source of all the wrangling which has been indulged in by Pyramid measurers and writers since the days of Herodotus, but especially within the last half century, and more recently since the days of Taylor and Professor Smyth. Th

popular theory is set forth in Mr. Petrie's statement given above, "that the sockets were cut to receive the *foot* of the sloping face, which was continued right down to their floors beneath the pavement."

Our theory is different. We consider the sockets were cut to receive the *heel*—and the *heel only*—of the sloping casing, and that the foot rested on the solid rock beneath the pavement, as shown in the following diagram.



In this theory the *heel* of the corner stone is in the socket, and the foot of the casing rests upon the same level floor as the pavement; whilst the backing of the casing is variable—thicker and thinner according to the situation of the stone in the alignment of the side. In the middle it would be a thicker backing than at the ends of each side, near the corners.

This theory is more architectural and consistent with the general theory of the structure and alignment of the sides. The corner stone of each angle must have a foothold and foundation in which it can rest, and resist any expansion of the diagonals and sides, and thereby firmly hold the sides and centre in their places. The corners of a building hold its sides together, and if the base had been built on the platform without the corner stones being imbedded in a socket, the sides would expand and slide out of place and position.

The prominent feature of this theory of the sockets is the extension of the foot and toe to any desired length, and the opportunity it gives to slide the socket backwards along the diagonal to any desirable distance, whether

for convenience or for symbolic purposes. Hitherto the four shallow sockets have been regarded as the ancient outer corners of the base; whereas the theory we now suggest considers that the ancient and original casing *overlapped* the sockets, and that the ancient base is not defined by the sockets, nor do the sockets give any truthful idea of the actual alignment of the base sides which *overlapped* the sockets at each of the four corners of base. We believe that a closer examination of the sockets, and for some distance beyond them, will confirm every feature of this new theory of the sockets and their significance. We shall not attempt to enumerate the numerous proofs which have led us to this result. All we can do, at present, is to generalize a little, and condense our statement as much as possible.

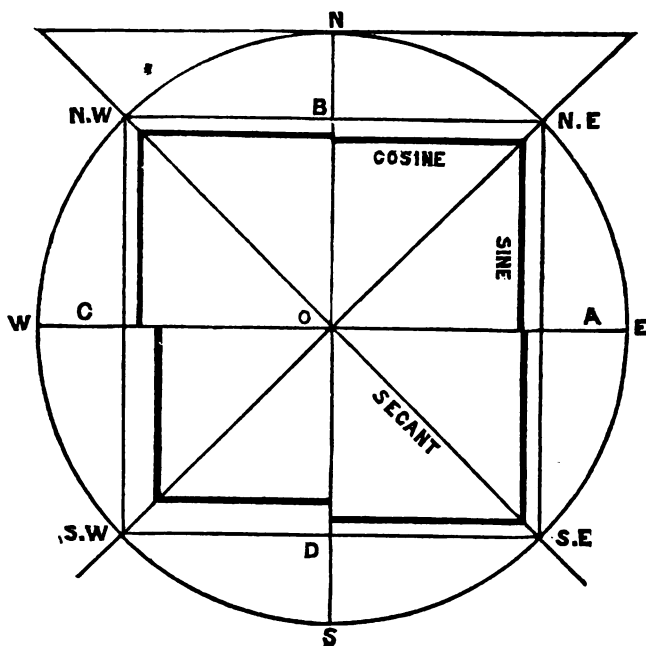
In our previous papers we have spoken of a *geometrical* base, which was taken as a standard and guide, in distinction from the supposed actual builders' base, of the Pyramid as it was originally built. This geometrical base we have always spoken of as the model theoretical base=9139.8712581 British inches,

with the formula: $\frac{180^2}{2\sqrt{\pi}} = \frac{16200}{\sqrt{\pi}} = 9139.8712581$. This ge-

ometrical base we now declare to have been the *actual original* base-length of the Pyramid, which the builders adopted as the *only real actual base*, as well as being its geometrical and standard base. We have introduced the following diagram in former articles embodying this conception, showing the relation of the core masonry to this base.

The *outer* square is the geometrical base of the Pyramid, which we regard as the *actual* square base of the Pyramid = 9139.8712 British inches to a side. If we estimate this geometrical base in time-factors of the equinoctial years—better known as the so-called Pyramid inches of Professor Piazzi Smyth—each side will be 9131.055 of these inches. And it is our firm and intelligent conviction that this is the only true theory of the Pyramid's base, and will be proven to be such by every competent exploration expedition that will be sent there in the future. Professor Piazzi Smyth's theory, when reduced to proper formulæ expressed in British inches, will outlive every other. The theory we now present assumes that the outer square is a

true representation of the perfectly square base of the original,



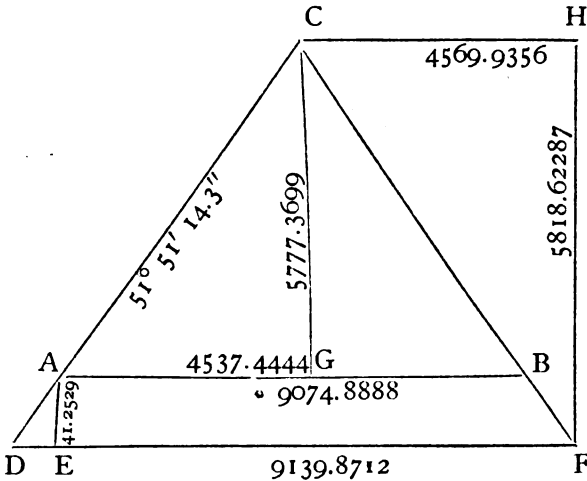
with sides of equal length = 9139.8712 British inches. The original base was a perfect square.

We now turn for illustration to Petrie's estimate of the core masonry and the thickness of the casing. We can only find space for a consideration of averages in this article. Speaking of the thickness of the casing, Petrie says: "If the angle on the south side were the same as on the north, the casing thickness, would be 69.2 on the south. This, therefore, seems to make it more likely that the south side had about the same angle as the north."—p. 43. We, of course, do assume that the angles of the faces on the north and south were the same; therefore we should accept the thickness of casing so given, namely, 69.2 inches. This, of course, is an average. It is thicker in the middle than at the corners, where it is thinner. Now look at the result:

N.	9002.3
E.	8999.4
S.	9001.7
W.	9002.5
Mean	9001.5
$69.2 \times 2 =$	138.4
	9139.9

Add the allowed thickness of casing, which is an *average*, to the *average* length of the core masonry, and the result gives the base side length we have given—9139.8712 British inches—the value of the geometrical base-side.

Now, let us try it in another way. We hold that both theory and fact require the *height of the pavement* to have a theoretical height of 41.2529 British inches, and that it is equal to the height of the basalt pavement in front of the eastern face of the Pyramid. Let us now calculate the length of the base of the Pyramid at this level.



AB, top of pavement,	9074.8888.
CG, vertical height,	5777.3699.
DF, lowest base,	9139.8712.
AE, height of pavement,	41.2529.
FH, total height,	5818.6228.
DE, thickness of casing,	64.9824.

Radius : 4537.4444 :: tangent $51^{\circ} 51' 14.3''$: 5777.3699 = CG.
 And by adding the height of platform we get 5777.3699 + 41.2529 = 5818.6228; whilst $5818.6228 \times \frac{\pi}{3} = 9139.8712$,

the base. Hence it follows that the true theoretical core length of sides must be 9074.8888 inches, instead of 9001.5 as given by Petrie; whilst the average thickness of the casing—taking thick and thin together—will be theoretically 64.9824 inches, instead of 69.2 as given by Petrie. $9139.8712 - 9074.8888 = 64.9824$ inches.

The theoretical views presented in our former articles were all based on the acceptance of the common theory of the sockets, as being the actual corners of the original base, and on the supposition that the socket levels were the actual levels of the original base. We accepted the theory of the author of the book we were reviewing as a matter of duty, and gave the only probable solution from that standpoint. But it may now be seen that we do not accept the author's theory of the socket corners, nor the conclusions he draws from the premises. And we accept no other theory but the one herein set forth, namely, that the casing stones overlapped the socket corners, and that nothing but the heels of the corner stones were placed in the sockets. The sockets originally held the corner stones of the casing, but they only held the heel of the stones, the entire fore-front of the sloping part of the stones overlapped the socket, forming a step or foot resting upon solid rock at the same level as the pavement foundation. The sockets did not define the alignment of the original base by the exact amount overlapped by the fore-front and foot of the stones.

There are proofs of this overlapping whose significance has been overlooked. The Royal Engineers in their survey and measurements of the sides, in 1874, gave 9140 inches for the length of the south side base. And they did so because they measured the southwest corner at a spot where the casing had overlapped the socket by over 17.5 inches on the western side. Petrie noticed this fact in these words: "NOTE.—This south side is stated as 9140. Now the outer west edge of the socket-block at the southwest is 17.5 beyond the drawn line (which really defines the socket), and it is therefore about 9140 from the southeast corner; hence, this was probably taken as the corner, and 17.5 must therefore be deducted from the Royal

Engineers, measure of this side in comparing it with other surveys.”

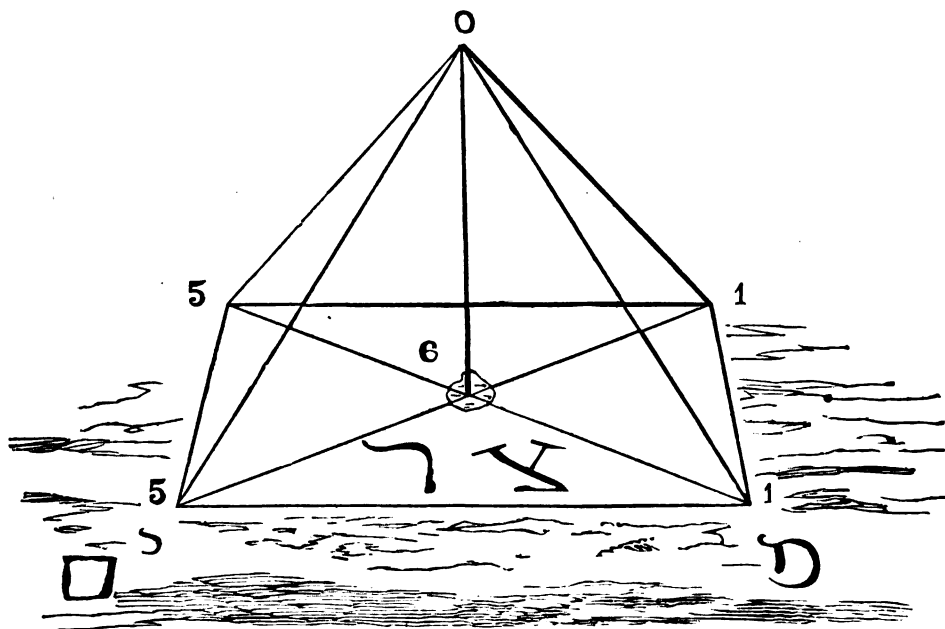
In other words, when properly understood, the overlapping foot of the corner stone at the southwest corner was about 17.5 inches beyond the socket in which the heel of the stone was placed. But the western edge of the casing stone or socket-block had overlapped or stepped 17.5 inches beyond the socket so obviously that the marks of its overlapping were taken by the Royal Engineers as evidence of the actual position of the corner; and they measured from that spot, and found the side 9140 British inches. A closer measurement would have given our theoretic value 9139.87125 inches, or 9141.055 of Prof. Smyth's time factors, or equinoctial time inches.

The original base of the Pyramid was a perfect square of 9139.87125 inches to a side; the geometrical base was its true base—its actual base—the builder's base, and the only base it ever had. The socket levels have been taken to indicate the actual length of the sides of the original base in some recent reviews of Petrie's book, our own articles included; but whilst we admitted the socket levels as data for computing the base sides, and tested their significance in the course of our duty as reviewer, yet we do not hold the socket levels to have the significance which Mr. Petrie has given to them; and therefore, the influences drawn therefrom are comparatively worthless, whether drawn by him or others. We predict that Prof. Piazza Smyth will yet be vindicated and the Pyramid theory be triumphant; and the formulæ, which the leading members of the Institute have adopted and worked efficiently in their researches, will be accepted as the only reliable Pyramid formulæ as a guide to Pyramid measurements, and in exposition of its plan, design and structure.

S. BESWICK.

Strathroy, Ontario, Canada.

A CRITICISM ON MR. PETRIE'S LATE PYRAMID MEASURES.



To test the value of Mr. Flinders Petrie's late work on the Great Pyramid, we, fortunately, have a common objective point in the measures of Colonel Howard Vyse, Piazzi Smyth and his own. Working from this, we can ascertain, to some extent, the true condition of some of his conclusions. We are, also, fortunate in having the carefully prepared chart of the Pyramid, issued by the Society. This chart is made up from the actual measures of various parties, especially those of Col. Vyse and Piazzi Smyth. In many respects their measures are in common, those of Col. Vyse having been verified by Prof. Smyth. Prof. Smyth pronounces the measures of Vyse, when tested for verification, "admirable" and "incom-

parable." It is thought that this encomium should carry with it a degree of confidence in those measures not tested by Prof. Smyth, made and reported by Col. Vyse. There is justification in this, because, on examination of the measures of Mr. Petrie as to interior work, he quite closely follows the measures of Smyth and Vyse, with Smyth's angles; in fact, with such a plus and minus quantity attached as to bring such measures within the fair assumption that the measures of Vyse and Smyth can be taken as justified by him. As to the Society's chart, it has this great advantage, viz.: it has a discovered origin of the measures by which the construction of the Great Pyramid was made, the standard unit of measure, which was our "Imperial British inch," and the number of such inches going to make one of the cubits used in Pyramid construction, viz.: 20.62647 such inches. This number, as 206264 seconds, is the radius seconds of the circle of 360 degrees. The proof of this is to be found in the measures of the coffer of the ante-chamber, and of a number of prominent lines of measure; and this proof is set forth in 'The Formulæ' of Mr. Dow, published in the Proceedings of the Society. Part of the system of construction has been discovered to have been that the measures were, for the most part, designed to indicate diameters of circles, the circumferences of which were integral quantities; and from which, among other consequences, astronomical measuring data, are inferential.

Such being the status, then it was found that the reported measures of Vyse and Smyth, with others, could be used for reconstruction, enlisting in their use everywhere harmony and symmetry under such a system. This is displayed in this chart. Indeed, the work is so carefully done, and so faithfully, that the lines everywhere close with each other, the interior working co-ordinately with the exterior, and *vice-versa*, throughout; and this, let us repeat it, with the use of the actual measures and angles furnished. It has been conceded by those who have tested the work that such fitting and harmony, such symmetry and adaptation, could only come from the fact of the recovered use of the architectural design, and the measures actually intended and made use of.

This is the material we possess for testing the work of Mr. Petrie; and, with this preamble, we will commence :

(1) With a discussion of the restoration by Mr. Petrie, of the descending passage way, or entrance passage. The data given us are: Mr. Petrie restores (1) the location of the passage and its dimensions by measures and angles; (2) he makes the connection of the passage with the mass, so as to give its relation to the exterior slope, and the vertical axial line, which he fastens as passing vertically through the peak, or gable ridge, of the queen's chamber; (3) because the 19th course of masonry is of a vertical thickness sufficient to admit the mouth of the entrance within that thickness, he postulates it that this is to be received as a *datum* of construction, and consequently works to this end as one of proper reference.

It is a happy thing for us that Mr. Petrie gives the height of the entrance passage, perpendicular to its incline, the same with that given by Prof. Smyth, viz: as 47.24 to 47.26 inches. Prof. Smyth computes this as 47.24 inches. The Society's chart gives it as 47.25419656 inches, deriving it from a π modulus, and from the origin of the Egyptian measures. This last, then, is our standard of reference to compare by.

Mr. Petrie gives the angle of the passage as $26^{\circ} 29' \pm 1'$, and $26^{\circ} 27'$ with a mean difference of $4'$. Prof. Smyth gives a number of observations of this angle, taken by different modes, in which we find $26^{\circ} 27'$, $26^{\circ} 27' 58''$, and $26^{\circ} 28' 16''$. The angle found by the Society chart is $26^{\circ} 28' 24.10''$, and this we take as our reference for a standard.

It will be seen that, so far, the variation from the reference standards adopted is so minute as to be practically *nil* in the distances to be affected by the reference.

This brings us to the measured dimensions of this passage way; (1) for its full length, and (2) for the distance from the mouth to the intersection of the first ascending passage way.

And as to this :

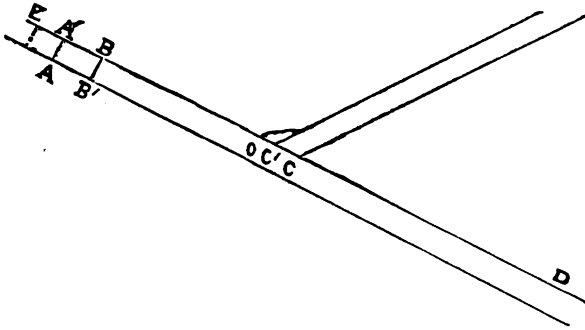
(a) Colonel Vyse, measuring from the outward edge of dilapidated roof of the passage, downward, gives the total length as 3850 inches. Mr. Petrie gives the same, practically, as 3856 inches, with, however, this statement of the measure :

“3825 to 3856 inches,” presenting a + or — of 31 inches to go on for exactitude. He adopts, however, 3856 inches, and on this makes the total length 4143 inches—“end of sloping roof 4137, Vyse, corrected for casing.” Mr. Petrie does not pretend to exactitude in these, his actual measures, but as is seen is quite liberal. As to this he says: “For the total length of the entrance passage down to the subterranean rock cut part, only a rough measurement by the 140 inch poles was made, owing to the encumbered condition of it. The poles were laid on the rubbish over the floor, and where any great difference of position was required, the ends were plumbed one over the other, and the result is probably only true within two or three inches.” This statement, with the somewhat enormous (for good measuring) limit of difference of 31 inches, can, it is thought, make us feel a greater confidence in the more carefully stated work of Colonel Vyse of 3850 inches. In other words: the giving of a greater and less than Vyse, with an admitted carelessness of measure, and a probable error of “two or three inches,” which we must take as a reduction from his extreme maximum, or $3856 - 3 = 3853$ inches, may make us feel, it is thought, an increased confidence in the measure of Col. Vyse.

(b) We now come to the connection of the entrance passage way with the exterior slope of the structure, which involves the ideal restoration of the dilapidated outside and its connection with the ascending passage way. This matter is of extreme importance, as by it Mr. Petrie places the whole interior passage and chamber work with reference to (1) the sloping outside, and (2) the vertical axial line of the Pyramid proper. He pronounces his work fit for future reference, as reliable, as worthy of taking precedence of all who have gone before him, the French, Col. Vyse, Prof. Smyth, and others; and here, certainly, we have one of the most important results of his work, and one which should be able to bear a tolerably severe scrutiny.

Prof. Smyth measured from the broken terminal end of passage way, from joint to joint, to the intersection of the ascending passage way, and in doing this so joined his work with that

of Col. Vyse, that we are able to find a joint in common between them. Mr. Petrie follows these measures with the like result, so that we have a common objective point, or joint, for the three.



Col. Vyse commenced his measures from broken edge of roof at B, giving total length BD as 3850 inches. (The edge of the roof stone B is broken and uneven, and for a finish may have projected beyond its present face.) From B, he says, to the junction of the first ascending passage way (that is, to the "break out" at O,) is 758 inches. Prof. Smyth, measuring from A, or edge of basement sheet, gives AB' as 162.3' inches. Then from A' (A'B being equal to AB') to C', that is, "from basement beginning to joint 18, situated up in a hole which is the continuation of the portcullis blocks" (or of the upper line of the ascending passage way,) "of first ascending passage way, and in their inclined line," 981.9 inches. C' is at this point, or joint. Then from B to C', by Mr. Smyth, is $981.9 - 162.3 = 819.6$ inches. He gives the distance from O, or joint 17, to C' as 60.0 to 60.3 inches; then from B to O is $819.6 - 60.2 = 759.4$ inches. Take it so.

It is to be seen that the point O is at the "junction" of Vyse, or the "break out," and Col. Vyse says it is distant from B 758 inches. This seems to raise a common objective point of measure for these gentlemen, with a difference of $759.4 - 758 = 1.4$ inches, which, perhaps, may be accounted for in their particular points of beginning to measure. It is from these data that, it is thought, the location of the point C can be recovered approximately.

Col. Vyse gives $BD - BO = 3850 - 758 = 3092$ inches, as the distance OD. Take 2061.2 inches, plus its half, or 1030.6 inches, and we have 3091.8 inches. By Col. Vyse, 3092.0 inches. Difference $\frac{2}{10}$ of an inch. Therefore the distance OD seems to be 150 Turin cubits, for the Turin cubit is 20.612 inches.

Prof. Smyth gives OC' as 60.2 inches, and $C'C$ (measuring from the basement beginning, as "1022.2—963=59.2 inches") as 59.2 inches; or $OC' + C'C = 60.2 + 59.2 = 119.4$ inches. Then CD would equal $3091.8 - 119.4 = 2972.4$ inches, or 247.70 feet. By calculation Col. Vyse's measure of this would be 247.71 feet, or 2972.62 inches. On careful consideration this distance was taken as 247.752659 feet, or 2973.0319 inches, which might lessen OC' or $C'C$ by the amount of 1.2 inches; about the amount of the difference between Vyse and Smyth mentioned, viz., 1.4 inches (above). The reason why this slight increase was made, was because it was found, in the adjustment of lines and angles, to serve as a solution of position for many interpretations of measures. (1) By it the distance from the intersection of the floor line of the ascending passage way with the roof line of the descending passage way to the vertical axial line was found, in feet, to be the square root of 63360, which is 5280 feet, or our mile measure, multiplied by 12. (2) By it, on the geometrical determination of the length of the ascending passage way, this was found to be 123.68300698 feet, while by the extraordinarily carefully taken measures of this length by Prof. Smyth, he makes it 123.683 feet. (3) This measure so obtained was found to give a deductive time measure of a most magnificent character, viz., of the solar and lunar elements going to make up what is called the "Metonic Cycle." Indeed the authority in reconciling reconstruction, for this step was ample as justifying it.

Now reversing, or going back, we have, D to $C = 2973.0319$ inches, then C to $O = 60.2 + 59.2 = 119.4$ less, 6319 equal 118.7681 inches; or, $2973.0319 + 118.7681 = 3091.8$ inches, and this plus the 758 inches of Vyse (or OB), equals $3091.8 + 758 = 3849.8$ inches. The common objective point is O , and from O to C' is 60 to 60.3, say 60.2 less 6319 inches.

Mr. Petrie gives, (1) From restored casing surface, on floor, to basement edge 124.2 inches. Then from edge of basement to joint 18. or C' , $1106.13 - 124.2 = 981.93$ inches; which Prof. Smyth gives as 981.9 inches. To same point by Vyse, there is a minus of 1.4 inches, as stated. From this we have, practically, an agreement of measure for Vyse and Smyth and Petrie of the distance $A'C'$, the distance $A'B$ being 162.3 inches. There is no dispute that C' is the intersection of the roof line of the ascending passage way into the roof of the descending passage.

Col. Vyse makes the total restored length of the entrance passage "about 4126 inches." Because 200 Nilometer cubits are $20.62647 \times 200 = 4125.294$ inches, this is taken as the true measure on the Society chart. We have then for the length of restoration by Vyse, from edge of basement sheet to outer face of restored casing, $4125.294 - 3849.8 = 275.494$ inches, less $162.3 = 113.194$ inches. By this the total length of the descending passage way is 200 Nilometer cubits. From O to D 150 Turin cubits, and from O to E 200 N. cubits less 150 T. cubits.

Mr. Petrie gives the restoration as 124.2 inches. Difference $124.2 - 113.194 = 11.006$ inches, as Petrie's excess over Vyse, for restoration. That is, Petrie makes the mass this much larger than Vyse. A slant rise of 11 inches indicates a base of about 10 inches, and for two sides of Pyramid this would indicate for Petrie's enlargement of base over Vyse's $10 \times 2 = 20$ inches.

By Vyse, or rather the Society chart, DC , as said, is 2973.0319 inches, then from C (the intersection of the floor line of the ascending passage with the roof line of the descending passage) to E must be $4125.294 - 2973.0319 = 1152.2621$ inches. The extension of the floor line for restoration is referred by a plane perpendicular to incline of passage, to the roof at E.

As seen, this is in practical agreement with Smyth's joint measures, and the location of the point C' , to within 1.5 inches.

NOTE.—Prof. Smyth finds a difference of something over an inch in the two lengths, on one or the other side, of the passage ways. By the Society chart the length of the descending passage way is 543.7745 + feet, and the base for this in-

The Unveiling of Isis.



THE UNVEILING OF ISIS.

The object of the picture is to show the Divine origin of our Flag—the BANNER OF ISIS—and of the children of *Isis* or *EVE*, and the rise of the Gospel Kingdom or the Kingdom of the Son of *Isis* (*Eve*), that is, of *Jesus of Nazareth*—*Daniel ii : 44*.

The Unveiling of Isis.

THE GOVERNMENT OF THE UNITED STATES IS ISRAEL RESTORED.—*Baldwin*.
THE KINGDOM WHICH JESUS CHRIST CAME TO ESTABLISH ON EARTH IS THE UNITED STATES OF AMERICA.—*Jesse H. Jones*. SEE 'PROPHETIC VOICES CONCERNING AMERICA.'—*Charles Sumner*.

LEGEND.—The picture represents or portrays a period of Prophetic History from the year 1492 to the year 1881 and beyond—that is, from the triumph of the Cross over the Crescent under Isabella, Queen of Spain, to the surrender at Yorktown and the rise of the United States of America and beyond, or from the "creation or revelation of the new heavens and the new earth" to the fulfillment of the "sign of the coming of the Son of man in the heavens"

The sign or symbol in the heavens represents a woman or church clothed with civil power; her crown, "a new Constellation" upon earth, the fruit of her work with the Moslem power under her feet. The sign is also Astronomical, representing the Sun in the constellation of Virgo or Isis, the Virgin (month of September); her crown, the Corona Borealis; the Moon under her feet, as the hand of the clock, marking the day of the month or the hour of the consummation of the symbol, after the flight of the woman or church to the wilderness on the wings of an eagle, namely 1st, the 7th O. S. or 17th N. S. of September, 1643, the rise of the United Colonies of New England at the time of the Puritan Revolution and the first struggle "for Christ's Crown and Covenant;" and 2d, the 7th-9th 17th of September, 1774, the rise of the United Colonies of America, the child of religious persecution, the sign or symbol of "a new constellation," *the Stars and Stripes*, "the Pillar of Fire"; marking the beginning of the second struggle "for Christ's Crown and Covenant."

As the principal angels or messengers of the woman or Church in bringing forward the new kingdom there stand three men, Christopher Columbus, Martin Luther, and George Washington, the personations of three saints—St. Christopher, St. Martin, and St. Michael; the impersonation also of three mythological characters, put forth as prophecies by our forefathers in Egypt—Serapis, Bacchus, and Hercules—typified by three birds, the Dove, the Swan, and the Eagle: 1st, the Messenger or Revealer of "the New Heaven and the New Earth;" 2d, the Angel of the Reformation; 3d, Michael, or the Godlike, the Conqueror of the Dragon. The periods of their work, 1492-1499, 7 years; 1510-1517, 7 years; 1774-1781, 7 years. Behind the first are seen the Three Ships, like Doves, in the port of the "Holy Saviour," San Salvador. Behind the second is the burning of Huss (the Goose), from whose ashes sprang Luther (the Swan). Behind the third is the surrender of Cornwallis at Yorktown.

NOTES.—Jan. 2, 1492, the silver cross, the grand standard of the Crusaders, was hoisted on the tower of Camares at the Alhambra, above the Crescent. Jan. 6, Day of the Epiphany, the feast of the Magi, Ferdinand and Isabella made their solemn entry into the Alhambra with great pomp.—*Spanish History*.

2. The Moon, the symbol of the Moors and other Mohammedan nations, and is used upon their banners.

3. Isabella (symbol)—The beautiful Isis—The worshipper of God—*The Church*. "By Isabella was accomplished the grand event of European policy, the expulsion of the Crescent; and through Isabella the most prodigious event of humanity, that which doubled its terrestrial domain." "It seems as if heaven had raised her for two purposes—the overthrow of the Crescent and the discovery of the NEW WORLD."—*Spanish History*. "Without reservation I declare that Nature has never produced, and that Providence has never crowned with a diadem, a woman who can compare to Isabella, the Catholic."—*Bishop R. S. de Arevalo*. "IN THE WORLDS OF OUR PLANETARY SYSTEM THE SUN NEVER CLOTHED OR ILLUMINED HER EQUAL."—*Cardinal Ximenes*. A woman, the Church—the English Church—clothed with the civil power, Elizabeth or the beautiful Isis, the antitype (symbol).

The Unveiling of Isis.

4. "For behold I create a new heaven and a new earth," etc.—*Isaiah*, the prophet of *Isis*, lxxv: 17; Rev. xxi: 1. Discovery of the *New World, the land of Isis*, Oct, 12, 1492.

5. "And then shall appear the sign of the Son of Man in heaven."—*Matthew* xxxiv:30.

6. "AND THERE APPEARED A GREAT WONDER IN HEAVEN, A WOMAN CLOTHED WITH THE SUN, AND THE MOON UNDER HER FEET, AND UPON HER HEAD A CROWN OF TWELVE STARS."—*Rev.* xii: 1. The sun represents the civil power clothing Isabella or Elizabeth; also clothing the Church; the crown represents the twelve colonies.

7. Virgo, or Isis, one of the twelve signs of the Zodiac, represented as a Virgin holding in her hand the first fruits of the harvest; also a Lotusflower, or a Maiaflower. The Lotus is sacred to Isis.

8. The Corona Borealis or Northern Crown, Isis Crown, or Ariadne's Crown (stars in circular form), a constellation in the heavens called the Virgin's Crown. The new constellation" Symbol of the United Colonies and States.

9. The woman fled into the wilderness * * * on the wings of a great eagle."—*Rev.* xii: 6, 14. The symbol of a ship or ships in which the pilgrims fled. The Mayflower sights land Nov. 9th, Old Style, or 19th, New Style. It is the day that Isis finds Osiris. The compact in the Mayflower, Nov. 11th, O. S., 1620—Advent day, Luther's day, St. Martin's day, Bacchus' day—the fulfillment of the wonderful myth of Isis and Osiris born in a LOTUSFLOWER, ISISFLOWER, MAIAFLOWER, OR MAYFLOWER. "IN THE CABIN OF THE MAYFLOWER HUMANITY RECOVERED ITS RIGHTS." * * * "HERE WAS THE BIRTH OF POPULAR CONSTITUTIONAL LIBERTY."—*Bancroft*. The great expedition of those who fled with John Winthrop in many ships from persecution, had for its flag-ship the great ship, Eagle, changed to the name of a noble woman who sailed in her—*Bancroft*. John Winthrop was chief magistrate of the United Colonies of New England.

10. September 7th, O. S., September 17th, N. S., 1643. The Moon under the feet of Virgo. The Sun clothing Virgo.

11. Signing of Articles on Sept. 7th, O. S., 1643, on Trimountain, Shaumut, the place of living waters—Boston, THE BETHLEHEM OF THE NEW WORLD—house of the Sun, of obedience, of Ceres or Isis, and of Bread. "This confederation was the child, which grew into a youth, and now waxes toward manhood as the United States of America."—*Charles W. Elliott*. "According to my calculations there only remains one hundred and fifty years to the coming of Christ."—*Letters of Columbus*. "This was a time of great expectation; the colonies looked for the 'second coming of Christ.'"—*Bancroft*. The New England Confederation of 1643 was the *model* and prototype of the North American Confederacy of 1774."—*John Quincy Adams*. *Fulfilled on the present site of OLD SOUTH CHURCH, BOSTON*.

12. Passage of Covenant September 17, 1643. The signing of the Scotch Covenant by the House of Commons and Assembly of Divines, in St. Margaret's Church, London, September 25, 1643.—*Carlyle*. "Christ's Crown and Covenant," inscribed on the banners of the Covenanters.—*Scotch and English History*. Sept. 17, 1630—Foundation of Boston; Sept. 17, 1643—Rise of United Colonies of New England; Sept. 17, 1774—First Declaration of Independence by Congress; Sept. 17, 1796—Washington's Farewell Address; 1787—Adoption of Constitution.

13. September 7, 1774.—First prayer in first Congress. Reading of Lessons in Prayer-book for the seventh. Special prayer for Boston and Suffolk County Convention in assembly. Remarkable scene in Congress, September 9, 1774, [9] A. M.—Central day of the symbol or sign, the Sun clothing Virgo. The Northern Crown rising. The Moon at the feet of Virgo—*Astronomical Calculation*. September 9, 1774.—"On the wisdom and on the exertions and on the fortitude of this important day is suspended the fate of the New World and of unborn millions."—*Joseph Warren*, in the Suffolk County Convention.—*Bancroft*. Passage of virtual declaration of independence. Answer to the Pray of the Nation in Congress assembled. September 17.—Anniversary of the rise of t

The Unveiling of Isis.

United Colonies of New England, also of the founding of Boston—Presentation to Congress of Act of Suffolk County Convention by Paul Revere. Passage of Resolutions sustaining the Act. (First Act of Congress promulgated.) (Wonderful scene in Congress.)

14. *Isaiah* lxvi; 8. *Sortes Biblicæ*.—*Samuel Adams*. BIRTH OF LIBERTY FULFILLED SEPTEMBER 9, 1774, IN MILTON, MASS., IN HOUSE NOW STANDING. 15. "A new constellation." Act of Congress, June 14, 1777. 16. *Exodus* xiii: 21. The first banner made by Elizabeth Griscom, and afterwards by her daughter, Clarissa Claypole. 17. "Christ's Crown and Covenant," the watchword of 1643 and 1774. See Bancroft.

18. Christopher Columbus, bearing the Rod and Staff of Isis, upon which is the child of Isis, on the cross of Isis. St. Christopher, or SERAPIS, the god of navigation, from Hispalis, or Tartessus, Tarshish, the Christ-bearer, a saint whose mission was to carry the Saviour across the water—the mysterious prophecy of the early and middle ages, of the one who was to come in person as the real Christ-bearer Dove. The colossal statues of the saint with the infant Jesus on his shoulders, crossing the waters, were numerous until the advent of Christopher Columbus, of whom St. Christopher was the patron saint and namesake.

19. Martin Luther, the second Elijah, from Eisleben, (the Life of Isis,) the Bacchus of the myths, the god of Liberty, not of License; holding the Life, the Book of Isis, LIBERTY. St. Martin, noted for his work of the destruction of Paganism. He went about throwing down altars, idols and images. He was especially noted for his benevolence and charity to the poor. He was the prophetic saint of Martin Luther—his patron and namesake. A goose is eaten on St. Martin's day. Luther was christened on St. Martin's day.

20. George Washington, of VIRGINIA, the land of Isis or Virgo, whose symbol is St. Michael or HERCULES and the dragon, the defender, the sword of Isis of the seed of Isis, bruising the serpent's head. St. Michael, the defender and saviour of the King's daughter, the Church, the patron saint of the Jews, the conqueror of the dragon, Michael—"like unto God, or Godlike," represented with shield and lance, the prototype of George Washington. Note following curious words of Rabbi Wise, of Cincinnati, to the Jews of America, 1860: "We need not look beyond the messiahship of George Washington."

22. The crest of Columbus, three doves (argent) in blue field, with words above, "Faith, Hope, and Charity." The bird or messenger of the Holy Spirit and Cross, and of Isis.

23. The crest of Luther, a swan. He was called "the swan of EISLEBEN, or of the Life of Isis,"—the trumpet bird—type of the prophet.—*Isaiah* xxvii: 13; lvii: 1. *Rev.* xi: 15.

24. The crest of Washington, an eagle, (the national bird,) indicative of the warrior, with shield, blue field, with three silver stars, and four stripes, alternate white and red, horizontal, the color of the symbol in the heavens—the Stars and Stripes.

21. It was the custom in the early and middle ages to portray persons having holy missions with birds' heads, their types, and they were painted with birds' heads. St. John was painted with an eagle's head. St. John the Eagle Prophet.

25. "God made me the messenger of the 'new heaven and the new earth,' of which he spoke in the Apocalypse of St. John, after having spoken it by the mouth of *Isaiah*, and he showed me where to find it."—*Letter of Columbus*.

26. "I do believe that I am that great trumpet which prefaces and announces the coming of our Lord."—*Words of Luther. Michelet*. Luther the angel of the Reformation. See Elliott and Barnes, and many other commentators. "And I saw another mighty angel come down from heaven, clothed with a cloud, and a rainbow was upon its head, and his face as it were the sun. * * * In his hand a little book open, * * * and when he had cried seven thunders uttered their voices, * * * and he lifted up his hand to heaven and swore * * * that there should be time no longer, or but a time."—*Rev.* x. A time, 360—364 years. Era of Reformation, October 31, 1517.

The Unveiling of Isis.

27. Michael.—*Rev.* xii: 7, 8. Washington. "This is he who was raised up to be not the head of a party, but the father of his country.—*Bancroft*.

"FAME SPREAD HER WINGS AND WITH HER TRUMPETS BLEW—GREAT WASHINGTON IS NEAR! WHAT PRAISE HIS DUE?

WHAT TITLE SHALL HE HAVE? SHE PAUSED, AND SAID NOT ONE, HIS NAME ALONE STRIKES EVERY TITLE DEAD."—*Sam'l Haven, 1789*.

28. Discovery, 1492-1499, seven years. "In seven years I accomplished this work, by the Divine will."—*Columbus*. 29. From Luther's call to Rome to publication of Theses, 1510-1517, seven years.

30. From Washington's entrance to Continental Congress to the surrender of Yorktown, 1774-1781, seven years. Surrender of Yorktown, October 17th to 19th, 1781. 31. Isaiah lx: 8, 9.

32. The burning of John Huss. "Are you going to burn a goose (Huss); in one hundred years you will have a swan (Luther) you can neither roast nor boil."—*Huss' words at the stake*.

33. End of the war. "Servant of God, well done."—*Milton*.

"These are the living lights,
That from your bold, green heights,
Shall shine afar,
Till they who name the name
Of Freedom, toward the flame
Come, as the Magi came
Toward Bethlehem's Star."

—]NO. PIERPONT.

"O trembling faith, though dark the morn,
A heavenly torch is thine;
While feebler races melt away
And paler orbs decline,
Still shall the fiery pillar's ray
Along the pathway shine,
To light the chosen tribe that sought
This Western Palestine."

—OLIVER WENDELL HOLMES.

cline is 307.727248 feet. If the distance from *C* to exterior was 1152.621, less .7 of an inch, or 1151.562 inches, then we would have this remarkable fact, viz., $307.727248 \times 1151.562 = 3543670548$. or, numérically, the exact time measure of the synodic lunar year of 3543670548 days! And this requires only a differentiation of $\frac{7}{10}$ of an inch, which is within the limits of Smyth's; which shows that this measure, for differentiation, is to be found in the breadth of the passage. The proportion is a natural one, lying in the comparative measures of the same diagram. It is as follows: 343.7745 : 307.727248 :: 1151.562 to the corresponding base of the small triangle; which, necessarily, would be 3543670548, or the year measure, divided by 343.7745, which, as radius minutes of 360 degrees, is 3437.745 minutes.

What makes this the more remarkable is this: The Society chart finds the length of the floor line of the ascending passage way to be 123.6830069 feet (Smyth 123.683). Differentiate this as 123.682684, by a difference of .0003 of a foot. The synodic lunar month has 29.5305879 days. Then, if the tropical solar year of 365.24224 days be divided by this, the quotient will be 123682684!

It is marvelous that two lines of two connecting passage ways should, when referred to their point of junction, show such exact relations as to *the same time period*, viz.: the synodic lunar month, used in one instance as a factor of the tropical solar year.

This is the more remarkable because, with the very ancients, the fundamental basis for astronomy was this synodic lunar month and year, and in the measure of 247.7526 feet, below this same point of intersection, is to be found the exact measure of the famous Metonic cycle, by means of the use of the elements of this cycle, as follows:

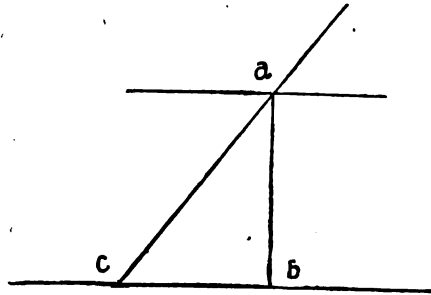
Two hundred and thirty-five lunar months of 29.5305879 (it is elsewhere taken as 29.530887) days, each amount to 6939.688 days. Nineteen tropical years of 365.24224 days each amount to 6939.602 days. The difference for this—the Metonic cycle—is .086 of a day. But taking the *lunar week year* of 364 days, then 991 weeks, of seven days each, amount to 6937 days,

showing a difference from nineteen tropical years of 2.602 days. Now, 991 *weeks* are just 247.75 *months* of 28 days each, and this architectural Pyramid line measure is 247.7526 feet. Here, if we take the continued decimal figures 26, beyond the 247.75, to indicate the 2.6 days over of difference, then with this intercalation the periods agree to within .003 of a day in nineteen tropical years!

Now, all these measures of time periods, founded on the *synodic lunar month*, are thus found to radiate from one and *the same intersecting point* of these passage ways. For the basis of the small triangle we may have 307.727248 : 343.7745 :: 1031.32 : 1152.129, and 307.727248 : 343.7745 :: 1030.6 : 1151.324; by which we see that the changes on its base for differentiation are closely connected with the cubit values in inches, viz.: 20612, the half of which is 10306, and 206264, the half of which is 103132 inches. These strange showings seem to point to the use of the diagonal joint across the floor of the descending passage way, so emphatically dwelt on by Professor Smyth.

To resume: Mr. Petrie, having "fixed the original position of the door-way of the Pyramid," gives a table of measures of the descending passage way, or entrance passage, p. 55; and, for *the connection of the ascending passage*, he measures to the intersection of the floor line of the ascending passage way with the floor line of the descending passage way.

To compare his work with Vyse's and Smyth's we will have, as a preliminary step, to refer his work and measures to the intersection of the floor line of the ascending passage way with the roof line of the descending passage way. For this we make the following diagram:

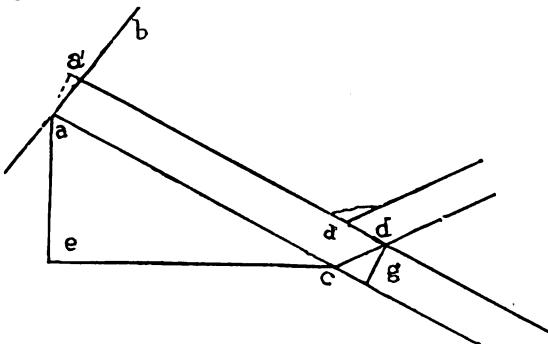


The point *c* is the intersection of the floors of the passages; *a* is the intersection of the floor line of the ascending passage with the roof line of the descending passage way; *ab* is perpendicular to the incline of the passage. The angle *b* is 90° ; the angle *c* is $26^\circ 28' 24.10''$ plus $26^\circ 6' 16''$, or $52^\circ 34' 40.10''$. Then the angle *a* is $37^\circ 25' 19.90''$. The height *ab*, or side of the triangle, is 47.254 + inches. Then we have

$$\begin{aligned} \text{Sin } c \ 52^\circ 34' 40.10'' &= 9.889918. \\ \text{Sin } a \ 37^\circ 25' 19.90'' &= 9.783675. \\ \text{Log. } 47.254 = ab & \quad 1.674402. \\ \text{Log. } 36.15 = bc & \quad 1.558159. \end{aligned}$$

So, to the distance down the passage to *c*, 36.15 inches are to be added to transfer the measures from *c*—the intersection of the floors—to the point *a*. By this *ac* becomes 59.5 inches. Professor Smyth calls it 60 inches.

With this preliminary step we can take up Mr. Petrie's measures of the descending passage way to the intersection of the ascending passage. He gives the following measures applying to this diagram:



The point *c* is by Mr. Petrie in vertical height above the pavement, 172.9 inches. The point *a* is, for same, 668.2 inches. Then the vertical distance *ae* is $668.2 - 172.9 = 495.3$ inches. With an angle of $26^{\circ} 28' 24.10''$, on the Society chart, the vertical height has the proportion to the slant length of the descending passage way of 153.2476 to 343.7745 feet. From this, with the vertical height 495.3 inches, of *ae*, the slant length *ac* must be 1111.09 inches. To refer this to *d*, the length 36.15 inches will have to be added, making the distance *a'd* (equal to *ag*), to the intersection of the floor line of the ascending, with the roof line of the descending passage way, $1111.09 + 36.15 = 1147.24$ inches, as the measure of Mr. Petrie. By the Society chart this distance as stated is 1152.262 inches. By Mr. Petrie, then, this measure is 5.022 inches shorter than by Vyse, while he has added, to complete casing, 11 inches in excess of Vyse. (In his tables of measures, Mr. Petrie gives the measures of length as follows: From finished casing to edge of basement sheet 124.2 inches, thence to intersection of floors of passages 986.44 inches; sum 1110.64 inches; which shows a difference from the above of .45 of an inch. Add 36.15 inches, to refer to *d*, and we have $a'd = 1146.79$ inches).

While, therefore, the length of this passage to this intersection is closely the same, with these measurers, yet the difference of 5.022 inches is sensible. It must be accounted for in the effort to close the vertical axial line, passing through the peak of the queen's chamber, with the mouth of the passage being located in the 19th course of masonry. For as to actual measures Mr. Petrie agrees with Smyth and Vyse. He says, page 56: To joint 18 (Smyth) 1106.13 inches. Deduct from this 124.2 and we have 981.93 inches, from edge of basement sheet to joint 18, while Smyth's measure is 981.9 inches. And Mr. Petrie commenting, says: "It will be found that his (Smyth's) measures make the passage length about an inch shorter as an average;" which shows that Mr. Petrie considers his actual measures, practically, as agreeing with those of Mr. Smyth. And on this we may postulate a guiding working fact. When actual measures are given, Mr. Petrie's work must be judged by them.

(c) Such being the status, then we have the following simple criticism on Mr. Petrie's work.

His length $a'd$ is 1147.24 inches. Deduct 124.2, "restored casing," and we have 1023.04 inches. Smyth gives dd' as 59.2 inches to "joint 18." Deduct this and we have 963.84 inches, as the resulting and necessary distance, by Mr. Petrie, from edge of basement sheet to joint 18. By Vyse the length $a'd$ is 1152.262 inches. Deduct 113.194 "restored casing," and we have 1039.068 inches for the same distance. Deduct 59.2 inches and there remain 979.868 inches for the same distance. Smyth gives this by actual measure, as 981.9 inches, and Petrie, by actual measure, as 981.93 inches. (The difference between 979.868 and Smyth's 981.9 or 2.032, may be corrected by making Vyse's restoration 111.162 in place of 113.194; correcting his 758 to 760.032 inches, Smyth's being 659.4 inches).

Compare Petrie's 981.93 with his necessary 963.84; the difference is 18.09 inches! By this the conclusion is inevitable that Mr. Petrie has forced a shortage of 18 inches, on the actual measure from edge of basement to joint 18, by suppositions and ideal distances. As this shortage must be corrected to the actual measures, then, necessarily the same shortage, or 18 inches, will have to be deducted from the ideal addition for restoration, because between the same limits. Deduct, therefore, this 18 inches from the 4143 (because by actual joint measures he agrees with Smyth and Vyse) inches, or his total length of passage, and there remain for this necessary correction 4125 inches; while by Vyse the passage length is "about 4126 inches," and by the Society chart, the same is 200 N. cubits or 4125.294 inches!!!

This result, however astounding, is the absolute outcome from Mr. Petrie's own data, and cannot be gainsaid. It follows from this that all he says as to the vertical axial line passing the apex of the queen's chamber has no foundation in fact from his own work. From what will hereafter be shown, quite similar to the above result, the solution of the matter seems to be this: Mr. Petrie seems to be following and confirming the measures of Col. Vyse, and, necessarily, those of the Society chart, to those who have the proper interpretation

of his work, or who will give it a careful investigation, while to the casual or careless investigator he interposes these confusing and perplexing blinds of detail and surface results by statement and in terms of measures. This section of examination can pertinently be closed with the quotation *Ex uno disce omnes*.

(II.) Leaving this branch of his work, Mr. Petrie has introduced to, or rather has intruded on, the inquirers into the construction of this work two surprisingly novel features.

(a) He deliberately cuts down all former measures of the length of the base side by some 30 to 40 inches. (See chap. vi.)

(b) He has found that the lowest core masonry course (specializing the one on the north side) *curves from the outer corners inward toward the centre*, so that at the centre the distance from, and perpendicular to, the chord of the arc to the centre of the curve is some 37 inches.

Now it must be borne in mind that the casing stone, (or casing stones) found in place by Col. Vyse is nearly at the centre. So, if this novel feature is truly the case, then if the lower and outer edges of the casing stones were, for position, lined on the chord of the arc, and if at the centre the casing stone found by Vyse showed a flat top thickness of some 51 or more inches, this 51 inches would thin out, as the curves extended toward the corners, to be only some 14 inches. By which, if the length of the base side was estimated by the conditions of construction of this casing-stone, at the centre, *in place*, against the core masonry, then, indeed, the true length of the base would be much less than the one apparently indicated by the casing stone with its flat top of some 51 inches in thickness; the curvature inward from the corners having been left out of account.

The feature is a novel one, and, if true, justifies such a result, unless, as would most naturally be the case, the curve of the core course should practically be a templet, by following which with uniform casing stones, or nearly so, the finished polished outside of the casing would follow the curve of the templet, by which no such lessening in thickness would take place. In all probability this stated feature of curvature does not exist. It would hardly have escaped notice in the many

careful examinations made of the base and core masonry. The rubbish heaps over almost the whole line of the base, with the corners of core broken away almost to the heaps, is quite a strong testimony and argument against the *ipse dixit* of Mr. Petrie.

But here, nevertheless, the assertion of this novel feature is a very important help, and in fact necessary to sustain the equally novel assertion of Mr. Petrie, viz: that all who have gone before him have erred materially, not only in their measures "between sockets," but also of "the present existing core masonry." So pat and necessary is this newly found curve, which no other Pyramid structure has, to the sustaining of Mr. Petrie's results as against all who have gone before him, that the assertion has all the appearance, at least, of a convenient invention to satisfy a theory calculated to mislead and confuse, as well as to silence criticism—in order that for the future Mr. Petrie's work may, on such statements of facts, be accepted as the standard guide in Pyramid studies. Mr. Petrie's statements may be true, and if true ought to be received. But Mr. Petrie's work, where trial can be made as to its accuracy, does not bear the test of careful examination; and this certainly tells badly in regard to his other assertions, especially where they seem to be so inconsistent with the recognized mode of Pyramid structure in Egypt. To this it should be added that the Royal Society have urgent and cogent reasons why the true measures of this Pyramid should not be commonly known, testified to by its treatment of Prof. Smyth, and by the actions of its various employés, among whom may be numbered the servants of the British government, notably Sir. Henry Somers, at the head of the Royal Engineers, with the subordinates of the Palestine Exploration, and, innocently enough, the wealthy and philanthropic Miss Coutts. These reasons are sound enough from their own peculiar standpoint, and as to them, where A, a very notable person, has a particular scientific knowledge of extraordinary value, it may be that, rightfully enough, he will endeavor to fudge, confuse, and mislead b, c, d, e, and many others of the smaller letters of the alphabet, who in their ill-timed researches threaten to make the grand discovery. Experi-

ence of this sort of thing might lead one to ponder on the expression *Timeo Danaos et dona ferentes*, and even to fear that a Trojan horse might be being thrust into the apparently peaceful assembly of earnest inquirers, even though some were saying, "Yours faithfully." Proof that this sort of procedure is in vogue could be given. It is well enough even in a peaceful pursuit, when the object is a universal in place of a caste good, to be wise as well as industrious.

Mr. Petrie gives the length of "the present existing core masonry," on the north side, on page 38 of his work, as 9002.3 inches, and as calculated from his diagram, Plate X, as 9014.6 inches. This assertion is as astounding to those who have been in the habit of referring to the labors of the French savans under Napoleon, of Col. Vyse, and of others, as his assertion on which this one follows as a sequence, viz: "When reducing my observations (by triangulation, a mode suggested by the employés of the Royal Society, to insure success) after the first winter, I found that the casing on the north side lay about 30 inches inside the line joining the sockets." This is the fundamental *datum* on which all his work is based, and we have to accept it upon his mere say so, because he gives us no means of testing his work of triangulation. Triangulation is a high sounding term, but the detailed work of observations may, as any expert will admit, easily cover gross errors; especially likely in the hands of one who can so blunderingly err with the plain measures of the descending passage way. Mr. Petrie has given us no modes of test save that of seeing how his own results appear upon their merits. To do this, notwithstanding his assertions of the "ought to be" sufficiency of his statements, he has afforded us no other course to pursue than to test his results and statements even by those who have preceded him. Like Malaprop, they have gone before, and he *is preceding them* by a clean reach over.

In Mr. John Taylor's 'The Great Pyramid,' we have as follows: Mr. Nathaniel Davison was the British Consul at Algiers in 1763. He frequently visited, examined, explored and measured the Pyramid. "He found the side of the base (existing core masonry) of the Great Pyramid to contain 746 Eng-

lish feet," or 8952 inches. "Davison's measure received, in 1798, a most satisfactory confirmation from the labors of the French *savans*. Having measured the apparent base of the Great Pyramid twice, viz., from east to west and again from west to east, with a good measuring chain, receding for that purpose 100 feet toward the north, but still keeping on a line parallel with the base, M. Jomard found the length of the Pyramid from one visible angle to the other to be 745.8 feet, English," or 8949.6 inches. Again: "The dimensions of the Great Pyramid, according to Mr. Perring, the surveyor employed by Col. Howard Vyse, are as follows:" and among them "The present base 746 feet," or 8952 inches.

Against this core masonry, near the centre, Col. Vyse found a perfect casing stone in place. It had a flat top of about 51 inches to the beveled surface, in horizontal thickness. Mr. Petrie finds this same casing stone in place, and gives as its measures 62 ± 8 inches on top, and $108 + 8$ inches on bottom, with height of 57.6 to 58.6 inches; and we may accept this measure because made for a special purpose of comparison. (Page 43.)

Col. Vyse made the former base with the casing stones 764 feet, the French 763.6 feet, and the survey under the Sultan 763.5 feet. The difference between 764 and 746 is 18 feet. This would show that the bottom thickness of casing stone was underestimated by Vyse, and really as Petrie gives it for correction, or else that the core masonry for the east and west termini of the north side was by Vyse found to be greater than he gives it. At any rate, these are the data we have to go on to test Mr. Petrie's work.

The difference of 8952 and 9003, or 9014 inches, or 51 or 62 inches, is too large not to attract especial attention, where the challenge is made against such parties as the French, Col. Vyse, and the engineers of the Sultan. It is too great for good surveying to admit of the conflicting measures being taken as of equal probable worth for obtaining a mean of measures. It is of so much importance that such a change on the former measures, especially by a single man, should make it incumbent on him to state accurately and systematically his mode

and details of work by which the conflicting result was obtained. The failure to do this may of itself fairly raise a reasonable doubt as to the rightness of his results. Manifest errors in other parts of his work would but add to this right and reasonableness of doubt.

But the matter becomes of curiously emphasized interest when this difference of 51 or 62 inches is found to be, in the first instance the measure of the flat top of the casing by Col. Vyse, and in the second instance the measure of the same by Mr. Petrie himself. That is, $8952 + 51 = 9003$, and $8952 + 62 = 9014$ inches.

Still stranger and more remarkable if we take for use Mr. Petrie's measure of the bottom thickness of the casing stone, or 108 inches, as the correction of Col. Vyse's statement, which we have the right to do, as he expressly avers that this is the average measure of the Vyse casing stone. If we add twice this, or 216 to 8952, we have 9168 inches, or the base side length of Col. Vyse!! And this showing is nothing more nor less than marvelous when we take it into consideration with the similar condition of results found in the measures of the descending passage way, unless, indeed, we explain away the mystery by the simple discovery that Mr. Petrie, under cover of a confusion of statements to mislead, is really refinding, confirming, and correcting the results of Col. Vyse. The results are clearly here under our very eyes, and so plain that a running man may read them. In the first instance, his own work shows the measure of 4125 inches, Col. Vyse's being "about 4126" inches, and here, in the second, his own work shows a measure of 9168 inches, also that of Col. Vyse!

Indeed there seems to be no escape from these as right conclusions from the measures, save by the "hollowing" or inward curvature of the core masonry as alleged by Mr. Petrie, For 8952 is a much less measure than the 9003 of Mr. Petrie. and the casing thickness (which he corrects to 108 inches) of at least $99 \times 2 = 198$ inches, is admittedly set directly against this, making a base side length of at least 9150 inches, which is an excess of the measure of Mr. Petrie. The "hollowing," or inward curvature, would satisfactorily account for this otherwise

insuperable error of statement by Mr. Petrie, provided he could show that the lowest outward edge of the casing was lined by the chord of the arc of curvature, which, however, he does not do; for the evidences do not exist, leaving the matter open to the statement of any desired opinion however far removed from the truth.

Mr. Petrie means necessarily to aver that the width of the core masonry at the centre, and at the Vyse casing stones, must be $9129.8 - 198 = 8931.8$, or else $9129.8 - 216 = 8913.8$ inches, which fact escaped the French, Col. Vyse, and all others who had preceded him, because of lack of observation of the "hollowing," or inward curvature, spoken of—which really makes the corner measures too thin.

As to this matter it seems to be but a fair presumption that had Mr. Petrie "reduced his observations" on the ground, and at the time of taking them, quite a natural use of his spare time, he would have found that he himself was the party in error. The difference was so great that it should have suggested, when found, a careful review and repetition of his work, which, however, he did not make. The importance of difference was so great, in view of its setting aside so much valuable and painstaking work of such distinguished men, that, in his own behalf, for modesty's sake and for the work's sake, it is natural to conclude Mr. Petrie would take the greatest pains to show clearly, plainly, and in satisfactory detail, the proof. He did no such thing, but to the contrary gives us a work vague in its statements everywhere; and reference is made to his work as a proof of this. He however places all investigators in the awkward position of trying to prove a negative. Any assertion of "You did" may be made, but it is very difficult if not impossible to prove that one didn't. Hence the care that Mr. Petrie should have taken, as a faithful and honorable searcher after the truth. It certainly is the truth that, on comparison, the labors of Col. Vyse and those of Prof. Smyth present an honest simplicity quite foreign to those of Mr. Petrie; and this is the more to be observed in view of the somewhat dictatorial terms in which Mr. Petrie sets aside as no longer of any authority the measures of these gentlemen.

(III) The last matter to be noticed in this criticism, as to which Mr. Petrie presents novel and strange features of measures, is in reference to the vertical height of the upper and outward edge of the basement sheet above the base of the Pyramid. He gives the measure as 611.2 inches. The vertical height of restored lower lip of mouth of entrance passage, 668.2 inches, agreeing practically with his given level of base of the 19th course of masonry.

Col. Vyse gives height of edge of basement sheet as 588 inches above the base; and by the Society chart, with this and the length of the passage, with the angle of Smyth, viz., $26^{\circ} 28' 24.10''$, the vertical height of outer and lower lip of mouth of passage is made to be 638.9 inches. How Col. Vyse found this the writer does not know, but judges it to have been by leveling from the base of casing stone, both objective points being in view, viz., base of casing and edge of basement sheet. It seems incredible that so great an error as 23.2 inches could be made by a competent and practical engineer in simple leveling for so small a height, with the termini in view, and in a field presenting few difficulties. The mode was simpler and better calculated to give a right result than by taking levels of masonry courses at corners three hundred and eighty feet distant, the intermediate space of courses being unknown for thickness because covered by rubbish. It would seem that, naturally, great pains would be taken to get this height accurately, as on it would depend the only mode for connecting the interior with the exterior. In this regard Mr. Petrie has introduced a new departure almost as startling as in the other instance mentioned, and because of the accumulation of such novelties, they appear as they accumulate, simply because they do so accumulate in his hands more and more incredible. There are too many of them, and appear Munchausen. His work is, by pronouncing these severe and many excesses of errors upon all his predecessors, subversive of all work done, former data being the guides; and the thought will rise that it is for the accomplishment of such a result, and to breed confusion, that his work has been set on foot, elaborated and published. Still his averments may be true, though probably false, and they must have the benefit

of the doubt. His statements in this last special regard can only be pronounced upon after taking a new set of levels by parties competent and trustworthy. If the height of the edge of basement sheet is such in fact as that its extension could end in the 19th course of masonry, then, because the thickness of this course would admit the mouth of the passage, Mr. Petrie's reasoning as to this matter seems sound and good. In fact, in all the novelties he advances, this one has the most to commend it as being reasonable and probable.

J. RALSTON SKINNER.

May 8, 1884.

THE UNVEILING OF ISIS.

VI.

In order that my readers may clearly understand the meaning of my work, I have had engrâved a copy of the picture embodying my thought, and publish therewith the notes attached so that they may have a synopsis of the whole subject for reference, whilst they have the detailed narrative of how I arrived at my conclusions.

As a whole, the picture represents the BIRTH OF LIBERTY. These three men, who stand in the foreground, are as the Magi who came to the birth of Jesus; they had seen his star or constellation in the east, and, being led by it, had come to worship him. These men, angels, or, in plain terms, messengers of the Most High, came to worship or assist at the birth of Christ's kingdom. The message to go and find the new world was given to the messenger of the new heaven and the new earth—the Christ-bearer dove—on 'the 6th day of January, 1492. This day is called in Spain the Feast of the Kings, or the Feast of the Magi. This day was at one time observed as the birthday of the Saviour. It was a fitting anniversary; and it was at this time that there might be seen streaming from the tower of Camares at the Alhambra the cross above the crescent.

All Christendom rang with the news of the downfall of the crescent, and great celebrations and rejoicings were ordered by the Pope, and, curiously enough, at the same time came the expulsion of the Jews, as if Isabella, the great queen, had said: Go, seek your asylum in the new world, where my messengers have gone before to prepare a place for you. And then, when the St. George arose in the person of Cromwell, being at the very time when Columbus had said, "*by my calculations there remain but 150 years to the consummation of all things,*" the poor oppressed Jew sent a deputation to him, saying: Art thou our Messiah, or do we look for another? It was not until the third one of the group appeared upon the scene, MICHAEL, the God-like, that the representative Jew of the United States, said: "My brethren, *you need not look beyond the Messiahship of George Washington.*" The three men represent the north, the centre, the south—the Anglo-Saxon, the Teuton, the Latin and, strangely too, the types of all were alike; each one stands six feet, with eyes of blue, and chestnut hair. And, singular for Spain, Isabella, a woman of wondrous beauty, had auburn hair and blue eyes. Roselly de Lorgues describes Columbus as "tall, well formed, head large, aquiline nose, small, light-blue eyes—grayish; majestic presence and great dignity." Luther is described as tall, large—not portly, dark blue eyes, dark chestnut hair. Washington, tall and well formed, blue eyes—grayish, chestnut hair.

There is a curious combination of sevens concerning them. The word *Columba*, the true name in Italy, has seven letters; some historians spell the name of Luther as *Leuther*, in which case there are seven letters; and in the name of *Washington*, or *Wessyngton*, the *ton*, or *town*, is a suffix, and the meanings of the words seem to suit their vocations, taken with the birds which are their crests. *Columba*—dove—is a messenger, and the dove is a proper symbol for the work he had to perform and suitable to what he called himself, "I am the MESSENGER of the new heaven and the new earth," etc.; and again he says, in his memoirs, "*Seven years* was I accomplishing this object in accordance with the divine will," that is, from 1492 to 1499. And the word *Leuther* is FREEDOM, in other words, LIBERTY,

and the swan his emblem. The black-billed American swan is the great trumpeting bird. Those who have ever heard the American male black-billed swan trumpet in the evening when startled or excited, can well appreciate the words of the poet, before quoted :

But hark! What sound out of the dewy deep!
 How like a far-off bugle's shrillest note
 It sinks into the listening wilderness!
 A swan! I know him by the trumpet-tone
 • Winging his airy way in the cool heavens,
 Piping his midnight melody he comes.
 Celestial bird! At this mysterious hour
 Why on the wing with chant so wild and shrill?

And why may we say that the swan represents Liberty?

Most of my best thoughts have come while in church, and meditating as I was almost constantly in leisure hours, or those not occupied in duty. In the little Episcopal Church at Meadville, in 1875, my eyes lit upon the dove in the stained glass window, then the thought flashed, Columba, dove—Christopher Columba—Christ-bearer dove—then looking up above there was a swan above the altar. My eye was constantly referring to the swan, and then I said, surely the Church must be symbolized by a swan; but when I asked some one who ought to know, he said, it is not a swan but a pelican, for the pelican sheds its blood for its young. Whatever, thought I, might have been the design, there is a swan—and again, in Trinity Church, Cleveland, there was the *swan*, perfect; and being with a friend there once, he said, “Did you see the swan above the altar?” “I did,” said I, “and wanted to ask you if you did not agree that it is a swan and not a pelican.”

Some time after that I came across that marvelous work “Luther’s Table Talk,” and there under the word “Swan” were Luther’s words:

“I don’t know a more exact image of the Church. The Church rests upon strong feet, so that the power of hell may not overthrow her. She is surrounded by lakes and marshes, that is, she aspires not to earthly dominion. She attacks not tyrants, but she repels their assaults by means of her two powerful wings,—the ministry of the Word—and fervent prayer. Finally the swan sings at the approach of death; so the Church,

when one of her members comes to his last moment, sings to him the glad notes of the Son of God."

What represents the Church but *Liber*, Freedom, *Liber the Book*; *Liber the Tree of Life*.

Beware, then, you who attempt to pull down the Temple of LIBERTY and tear from it the Free Book planted in our schools, for God will surely smite you with a curse if you remove this candlestick out of its place.

Seven years was the work of Luther until the grand act of his life, on the 31st of October, 1517,—that is, from the time he went from the shore of the Mediterranean to Rome, 1510—seven years.

But not only have we the dove and the swan, but the eagle in these churches. Here we have these three birds, and these alone in the church and above the altar. Why? These are the demi-urgic birds which brooded upon the water of chaos, symbols of the Godhead. And the third of these, MAGI, he who has the eagle for his emblem—this name signifies *high, keen, lofty*.

"She (who? FREEDOM) called her eagle bearer down,
And gave unto his mighty hand
The symbol of her chosen land."

THE EAGLE.—"*Percival*."

"Bird of the broad and sweeping wing,
Thy home is high in heaven,
Where the wide storms their banners fling,
And the tempest-clouds are driven.
Thy throne is on the mountain top;
Thy fields, the boundless air;
And hoary peaks, that proudly prop
The skies, thy dwellings are.

"Thou art perched aloft on the beetling crag,
And the waves are white below;
And on with a haste that cannot lag,
They rush in an endless flow.
Again thou hast plumed thy wing for flight,
To lands beyond the sea,
And away, like a *spirit wreathed in light*,
Thou hurriest wild and free.

Lord of the boundless realm of air,
In thy imperial name
The hearts of the bold and ardent dare
The dangerous path of fame.

Beneath the shade of thy golden wings,
The Roman legions bore,
From the river of Egypt's cloudy springs,
Their pride to the polar shore.*

For thee they fought, for thee they fell,
And their oath on thee was laid ;
To thee the clarions raised their swell,
And the dying warrior prayed.
Thou wert through an age of death and fears,
The image of pride and power,
Till the gathered rage of a thousand years
Burst forth in one awful hour.†

And then a deluge of wrath it came,
And the nations shook with dread ;
And it swept the earth, till its fields were flame,
And filled with the mighty dead.
Kings were rolled in the wasteful flood
With the low and crouching slave ;
And together lay in a shroud of blood,
The coward and the brave.

And where was then thy fearless flight ?
O'er the dark and mysterious sea—
To the land that caught the setting light,
The Cradle of Liberty.
There on thy silent and lonely shore
For ages I watched alone,
And the world, in its darkness, asked no more
Where the glorious bird had flown.

But then came a bold and hardy few,
And they breasted the unknown wave ;
I saw from far the wandering crew,
And I knew they were high and brave.
I wheeled around the welcome bark,
As it sought the desolate shore,
And up to heaven, like a joyous lark,
My quivering pinions bore.

And now that bold and hardy few
Are a nation wide and strong ;
And danger and doubt I have led them through,
And they worship me in song.
And o'er their bright and glancing arms,
On field and lake and sea,
With an eye that fires, and a spell that charms,
I guide them to victory !"

* The Roman standard was the image of an eagle. The soldiers swore by it, and the loss was considered a disgrace.

† Alluding to the destruction of Rome by the northern barbarians.

It is said that the flag was fashioned from the colors of his coat-of-arms upon his signet-ring. Certainly is it true that the colors he bore gave rise to the Star Spangled Banner, and by their mysterious link in the chain prove him to be he who should come "MICHAEL" to defend the *woman*, the Church representing freedom symbolized by the *swan*, for the same colors are seen in the figure above his head in the Apocalyptic Vision.

Seven years was his work from the time he knelt in the first Congress in prayer to God, September 7, 1774, until September, 1781, when he knelt in that Gethsemane of the revolution at Yorktown. He stands as the conqueror of the dragon, the true personality of Him who was to come—written in the heavens, spoken of by the Prophets—and here in the vision represented. He stands with Columbus and Luther as the coadjutors and predecessors in the grand consummation, as a duplicate of the transfiguration on the Mount.

These are the living lights
That from your bold, green heights
 Shall shine afar,
Till they who name the name
Of Freedom, toward the flame
Come, as the Magi came,
 Toward Bethlehem's star.

In the heavens, LIBERTY, clothed with her garments of red, white and blue—the doors of the New World opened henceforth for the oppressed of all lands—and crying:

"LIFT UP YOUR HEADS, OH, YE GATES, AND BE YE LIFTED UP
YE EVERLASTING DOORS, AND THE KING OF GLORY SHALL COME
IN."

For now is set up that kingdom which Jesus the Christ came to establish upon the earth.

One day I received a letter from Jesse Jones, a Congregational minister, of New England, one of the greatest, though unrecognized, thinkers of the day, through Mr. Bisbee, our secretary, which said, that remarkable picture of "The Unveiling of Isis" is before me. If Mr. Latimer would like to know how closely we have thought together, I will send him a copy of my

book, "The Kingdom of Heaven,"* and let him get Charles Sumner's '*Prophetic Voices Concerning America.*'—I procured the books and found the contents of page 215, of Jesse Jones' book, written in 1871, as follows, these words covering the whole page, in order to emphasize as completely as possible this thought:

"THE UNITED STATES OF AMERICA IS THE KINGDOM OF HEAVEN, WHICH JESUS CHRIST CAME TO ESTABLISH UPON THE EARTH."

He says: "The History of the world from this time forth is to be the history of the Americanization (*I would say Anglo-Saxonizing*) of all its peoples, which is the same as to say the Christianizing of mankind. This does not mean the absorption of all other nations into the American nation, for such will not be the case. It means that each nation retaining its own autonomy will adopt the American ideas and system of government, and every nation on the globe will be Republican. Then cometh the culmination, then will be formed the supreme and sublime coalition, the union of all nations under one administration—THE UNITED STATES OF THE WORLD, and its capital will be Jerusalem. Then will Jesus Christ come again, ascend his throne on Mount Zion, and sway the sceptre of universal dominion over a united race of loyal subjects. * * * We have found that every considerable characteristic of that kingdom is either actually or germinally present in the United States of America. We have found that all the great organic ideas of the Kingdom, those fundamental principles which determine the form of structure, bear the same relation to that nation. We have found also, that many of those details and results which the Bible gives as characteristic of the Kingdom are equally characteristic of it. Furthermore, the whole direction of its movement is evidently in a right line towards the complete realization of all that was ever foretold concerning the Kingdom.

This series of facts is wonderful, is startling, indeed, in its suggestive significance. Finally, it appears that there is no

* NOTE. 'The Kingdom of Heaven, What it is, Where it is, and the Duty of American Christians concerning it.' (For sale by Noyes, Holmes & Co., 117 Washington Street, and 9 Cornhill, Boston, Massachusetts.)

similar nation on the globe, nor has been since the Christian Era, except in so far as some feeble copies of this have been attempted. In short, the Kingdom of Heaven has been the real idea of the United States of America from the beginning until this day, however unconscious its own citizens or the rest of mankind may have been of the fact. Its governmental structure has been, and is, so far as it has gone, the incarnation of that ideal. Its history has been the history of a steady advance towards perfectness of realization by incorporating one after another, the fundamental law, and the constitution, into its conduct of affairs. * * *

The trials which were foretold of the kingdom by the Prophets and by Jesus Christ are the supreme facts which it presents, and which have shaped the forms of its organism and determined the evolution of its history. Evil has been mingled with its good throughout, as was inevitable in the midst of such a race as mankind; but the good has faced the evil repeatedly, and has finally conquered. Our late war and its results are the culmination of all our past, and the prophecy of all our future. Other struggles are to come, but the end will always be the same. With steady flow and irresistible sweep our nation is to move forward on its present line of progress, thrusting out from itself one evil after another, and incorporating into its organic law one principle of the Kingdom after another, until, at last, it becomes the complete, harmonious, symmetrical, perfect embodiment of them all.

The facts that I have thus epitomized have never belonged to any other nation of men, and they seem to all converge to a conclusion fitted to thrill the heart, overwhelm the imagination, and conquer, with irresistible conviction, the intellect of every Christian citizen. In the utterance of this sublime fact all my labor culminates, and I hasten to its accomplishment.

CHARLES LATIMER.

THE METRIC SYSTEM.*

MR. EDITOR:—A pouring rain that prevents sight-seeing, and almost hides the towers of Wartburg Castle on the hill opposite gives me a chance to say a few words about an article recently published, which says that the Librarian of the Paris Geographical Society has prepared a table showing what countries have adopted the French metric system and have made its use obligatory. The total population of these countries is given, and it professes to show that the people who use this system are vastly more numerous than those who do not, and among the minority are mentioned Great Britain and the United States. Thus those using the system aggregate, say, 241,972,011, as against 97,639,825 not using it.

I notice among those countries where this system is said to be in compulsory use, Norway, Sweden and Denmark. Now, I have just visited these three kingdoms, and while there I made it my business, as I have done in other countries, to make a full inquiry into the practical operation of the French metric system. I find that the Governments of the three countries above mentioned have adopted the system; and have appointed a date a few years in the future when its use will be obligatory, but as yet it is not in general use except among the employés of the Government or in Government depots. The people at large know little or nothing about the subject, and small progress has been made towards preparing them for the change. In the railroad stations may be seen charts hanging on the walls that give the system in a graphical way, and the weight of the luggage upon which an extra charge is made is computed in kilos, not in pounds; while everything weighed in the shops or markets is reckoned in pounds or measured by a "yard-stick," which is twenty-five of our inches in length; this I give from actual measurement—although the shopkeepers say that the Swedish measure for cloth is two-thirds of the English yard.

* From the Philadelphia *Ledger*.

In Denmark so little is known about the enforced adoption of the French system that an important shopkeeper told me that it was never to be adopted.

What I wish to make clear to the readers of the *Ledger* is that the mere fact that the inhabitants of the countries using the metric system are more numerous than those of the countries which do not use it does not furnish so strong an argument in favor of the enforced adoption of this system as would at first appear. The interests involved and the industries which would be affected by the change must be considered. The uprooting of any established system of weights and measures is a matter of very serious import, aside from any question of the relative merits or demerits of the adopted or abandoned systems, and this is especially true of manufacturing countries where vast and varied processes depend upon established standards. It is not an exaggeration to assert that the confusion and loss caused by a change in the system of measurement in Russia, with her millions of peasantry, would be less than that sustained in the city of Philadelphia alone from a like cause. England and America combined control the majority of the commerce of the world. England and America combined lead the engineering output of the world.

To the merchant who buys and sells, it makes no matter if the yard is one of 25, or 36 or 39.39 inches long, nor if the pound weighs more or less than a pint of water; but to the engineer the matter is of more vital importance.

I have gone this summer through the workshops of almost all the great countries on this side of the water and in those of Germany. I have seen the practical use of the system that I have for so long a time condemned. I frequently asked engineers if they like the system and if they use it, and I will give the answer of one in Berlin: "We use it because we have to, and it is better to have some uniform system than the many measurements that formerly prevailed in the German States. The unit of the machine shop is the millimetre in everything except bolts, nuts and screws. All bolts and nuts are made to the English inch, because we use the Whitworth system. We

do not like the metric system because it has too small a unit and the metre is too large and involves the use of decimals."

In Philadelphia the firm of William Sellers & Co. adopted the French metric system in an important part of their works as long ago as thirty years, and have continued its use since, until their workmen are as familiar with it as with the inch. With all this long practice during my connection with the firm, I have written and spoken against the enforced adoption of the system, not only because of the expense involved in changing, but because it is not a practical system; it permits of no elastic gradation of shop or trade sizes. The millimetre is taken as the standard to avoid the complication of the constant use of decimals, as nearly all measurements in machine work are less than one metre. This small measure involves many figures, and does not permit any good memorizable series. The inch cut up into the natural division by constantly halving permits the use of sizes best suited to the needs of the workmen.

The standard of the French system is a certain bar, kept for comparison; so is the English yard, from which we get our feet and inches. The high-flown notion that the metre is a measurable portion of the quadrant of the earth's circumference has been given up long ago, and the measurements of England and America are on a better basis of accuracy to-day than that of any other country. The French system theoretically predicates its weights on the weight of a cubic decimeter of distilled water at a temperature of 39.1 deg. Fahr., the weight of which is called the kilogramme, and is two and two-tenths of our pounds; but really the standard unit of weight is the platinum kilogramme-weight deposited in Paris.

In Germany you never hear of the kilo, but they sell by the pound, their pound being the half of one kilo; this they cut up as they please into smaller weights, and you can buy a pound of grapes or butter just as well as you can in America. It is claimed that given the metre, all weights, etc., can be deduced from it; in theory this is very well. The most skilled workmen, however, are not yet able to make two litres of water weigh alike to the utmost point of accuracy, and the cubical litre is not used, but is converted into a circular or cylindrical

vessel, with all the trouble of the problem of squaring the circle.

If a bar of ordinary forged iron be planed up to measure one inch square, and the bar be one English yard long, it will weigh ten pounds, and the tenth of such a bar will weigh one pound more accurately than will the ordinary litre of water weigh one kilo. The English engineer in these days of iron knows when he uses shapes of iron rolled of uniform section that the tenth of their weight in pounds per yard give him the area of the section, and this admirable incident will long fix the desirability of the present unit of England and America.

When we consider the interest involved it will be seen that the population now making practical use of the English standard is greatly in excess of that using, by force, the French system. Millions of those numbered among the people who use the French system have no occasion to use any or know any system whatever, save in the crudest form.

Swedish iron and steel are rolled to English inches in size; so, also, their boards are cut to the English inch, because their market is largely in those countries that use the inch. In the Russian machine shops the English inch is used exclusively, and, as I have said, throughout all Germany it holds for all screw sizes. In France and Belgium the yardstick is the metre hung from the rod, like the crossbracket of a drop gas light, placed about eighteen inches above the counter. In Germany the half metre, or twenty inches, about, is the measure used, and that held in the hand of a salesman by a handle at one end of the measuring stick. The Swedish machinist carries in his pocket a rule on which he has the English inch, and by its side the French measures; on the other side he has the two Swedish feet; one long in use and one ordered to be used but never put into practice. The Swedish roads are laid out now in kilometres, and marked by iron plates, giving at each ten kilometres the distance from some place, while half-way between is a sign 5 kl. This division of the roadway seems to them to be fine enough, as the old Swedish mile was six and two-thirds of our mile, and five kilometres is a less distance.

Carefully as I have considered this subject of weights and measures during the time I have been from home, I am the

more confirmed in my opposition to the enforced adoption of the metric system of France in my own country, and firmly believe that those countries that have adopted it are at a disadvantage as compared to even the most imperfect of our systems. America has entered on the line of simplification of its metrology, and that is the direction that should be followed, not by any means giving up what is good, but by making what has been found to be practical better and simpler.

One has not to be long in England to find out how firmly are the seemingly complicated systems of weights and measures of that country fixed with the people. They weigh by the stone and compute by the sterling currency as rapidly or more so than we do with our dollars and cents, and that because their unit is larger. The English shopkeeper knows nothing about decimals, and says, if you ask him, that he has never learned what they are.

England has lately made legal the admirable standard manufactured by Sir Joseph Whitworth, and the chance of her adopting the metric system is not in the most remote degree possible.

Very truly,

COLEMAN SELLERS.

Eisenach, August 24, 1884.

CHARLES CASEY'S SOLUTION OF THE MEANING
OF THE "UNINTERPRETED SIGN:"

*A QUOTATION FROM AN ARTICLE BY COCKBURN MUIR.

"The crown and climax, however, of the evidence was the verification in the measures of an entirely unsuspected order of ideas, unrelated to any geometric or mathematical expression whatever. In the course of his explorations in 1865 (note that the *dates* are of vital consequence throughout the whole evidence) Piazzi Smyth was surprised to find in the entrance-adit that, while all the rest of the joints of the masonry were vertical to the direction of the adit, there are two on each side, a short distance from the entrance, which are vertical to the horizon. As they seemed to be intended as pointers to indicate some special feature, he made careful search, and discovered near the second joint on each side a remarkably fine and straight line; both evidently incised with finest care and precision. In 1867, in his book 'Life and Work at the Great Pyramid,' he described these lines, but could so little divine their intent that he called them the *uninterpreted sign*. But the strangest incident of the matter was that, while he measured every joint and stone of the interior that he could lay hands on, these two special and remarkable lines he passed over without measuring their position, content to note only their existence. We shall see presently that, as elsewhere throughout, his hand had been guided, so here it was stayed by Him whose Witness this is; that the evidence should be set above the breath of suspicion, and that it should be ultimately completed seven years later by totally independent and unconscious instruments.

"In the meantime a young naval architect, Robert Menzies, who has built one of the fastest craft that ever bent canvas to a slant of wind, and who, amidst his professional duties, has his mind occupied with high thoughts, was impressed with the con-

* In 'Life From The Dead,' Vol. iv., No. 45.

viction that the lengths of the adits and gallery express *chronological* epochs; that the ascending-adit indicates the true interval from the exodus to the advent of Messiah; and the gallery the duration of the present dispensation, specially indicated—first, by the sudden change from the low adit, of $52\frac{3}{4}$ inches vertical height, in which one must stoop, to the lofty 340 inches of the gallery; then by the 33 inches from the beginning of the gallery to the mouth of the well, corresponding with the years of our Lord's life on earth; and again by the 36 'overlapings' along the roof, corresponding with the months of His public teaching.

"In 'Egypt's Record of Time,' published in 1869, three years before the solution of the 'uninterpreted sign,' the Rev. W. B. Galloway established two things, (1) that our present reckoning of time, as from the incarnation of our Lord, is accurate within three months; and, (2) that the interval from the exodus to that event was 1540 years. My venerable friend, who rejects the witness of the Pyramid, could not foresee that he was thus furnishing independent evidence of its truth.

"The discovery that the sum of the diagonals of the base expresses the period of the precession, had already shown that inches of length were used by the designer to indicate years of time; just as in the base-side cubits are used for days. The measures gave for the length along floor of ascending-adit, from floor of entrance-adit to beginning of gallery, 1542.46 Pyramid inches, thus agreeing within small margin with the period deduced by an entirely isolated, careful and masterly investigation of the data of history and the records of Egypt itself.

"The engineers have always been to the fore in this business. It is all in their line. But I beg you of your condescension to understand that, from their training, habits, and the nature of their duties, and very grave responsibilities, they are an incredulous and hypercritical set of mortals. Having to deal day by day with hardest of hard facts and driest of figures, the thing they hate most is a 'theory.' Their only touchstone is—'*practical.*' That engineer is a lost man who gets bitten of a 'theory.' In this question of the Pyramid they begin generally (again and again I have known it so) by treating it contemptuously. Then

out of pure contradiction they look into the measures to find the means of demolishing the conclusions. Eventually they are conquered by the power of the evidence, and submit—like all well-disciplined minds.

“ Another, then, formerly of this confraternity, but now—*poeta nascitur*—our excellent friend Charles Casey, with a softened heart of the arid and thirsty sort, but with a very hard head slow to be convinced, was not disposed to accept the conclusion of divine inspiration in the Pyramid without such evidence as should not be capable of misinterpretation. There were many more, myself included, who felt that a conclusion of that immense gravity was not to be lightly approached. He argued very discreetly that if the ascending-adit was truly *intended* to indicate prophetically the time from the exodus to the advent, and the gallery the dispensation of the New Testament, it was hardly conceivable that there should not also be some special *numerical* indication of the interval which was to elapse, from the date of the structure to the greatest of all events in human history, the coming of Christ. Following up, therefore, the extraordinary corroboration of Menzies' identification, and as the date had been astronomically determined as 2170 B. C., he enquired if there were any special feature at that number of inches back from beginning of gallery. Piazzzi Smyth had never until then observed that the abnormal joints and the adjacent fine-ruled lines already described were at *about* that distance; nor, to quote his published words, ‘ever thought of them before in connection with *possible indications of date*, or indeed of anything else by virtue of their precise and absolute *place*.’ But the persistent postulant wanted to know their precise and absolute place. The Professor could not tell. *He had not measured it*. It became urgent, then, to write to Cairo, to another engineer, Mr. W. Dixon, who happened to be on duty in those parts, to ask him to supply the necessary measure. Although ignorant of the purpose, but specially desired to use the utmost precision, he took with him to attest and check his work Dr. Grant, of Cairo. It is necessary to observe very particularly that, as the distances of all the joints had been carefully noted, and published also to the world, by Piazzzi Smyth,

all that was asked from Cairo was the distance of the lines from the adjacent joints. When the measures were received, it was necessary only to deduct them from the distances of the nearest joints previously determined. The result was that the precise distances of the incised lines from the beginning of the gallery proved to be in Pyramid inches:

On the East Side,	2170.5
On the West Side,	2170.4

the difference between the two sides being thus only one-tenth of an inch. This occurred in 1872. Thus after seven years the 'uninterpreted sign' was interpreted, its mathematical value attested by unconscious instruments, the intervention of the divine hand made plain by incontrovertible evidence, the element of prophetic chronology in the Pyramid established, the prime reason for its existence explained, and the words of the holy prophet verified:—*In that day shall there be an altar to the Lord in the midst of the land of Egypt, and a monument at the border thereof to the Lord. And it shall be for a Sign and for a Witness unto the Lord of hosts in the land of Egypt.*"

AN EXTRACT FROM A LETTER OF CHARLES CASEY.

"In 1872," writes Mr. Casey, "I had been working for some four or five weeks on measures of the Pyramid, in search of an indication of the astronomically fixed date of erection, viz.: 2170. My search measures had been applied to the outside of the Pyramid; so, on writing to Piazzì Smyth on the fruitlessness of my work, he replied that he thought the test search should be applied to the interior, and not to the exterior, as regarded chronometrical data. Taking the thought into cogitation, and shutting out geodesic, astronomical and cosmical considerations as being interesting rather than vital as to the divine inspiration of the architect, there came into my mind one night (when reflection seethed in my thought) suddenly, as the opening of a door letting a flood of light into a dark chamber, a conclusive conviction, which, being put into words, said: 'If Muir's thesis is true, and the chronological metrology of the Pyramid retrospectively and prospectively inspired, there is *one date* in the time record of earth, viz.: the birth of

Christ, which *must appear* in the Pyramid measure, else its character, as a monument whose architect acted under divine inspiration in its construction, has no confirmation in demonstrable fact.' Under this paramount conviction I wrote Piazzi Smyth, on the next day, the sum of my conclusion. To that letter I had no reply in ordinary mail course, and the matter lay dormant in my mind until some time after I received a letter from my good, zealous and patient friend, the Astronomer Royal, stating that, on receiving my letter, he had forwarded its thesis to Waynman Dixon, then in Egypt, who had gone critically over the passage measures and found, at 2170 inches from north end of grand gallery, the mysterious line which Piazzi Smyth had noticed and described in 'Life and Work' (1867).

"The astounding result completely unnerved me; the thought that here now in this, our generation, had been given an irrefragable testimony above and beyond the reach of verbal quibble or contest, to the truth of the Holy Scriptures and the divine nature of Jesus Christ; a testimony resting not on the sandy foundation of words, but on the rock-basis of infallible mathematics—the only science to which all rational minds, in every age and nation, are compelled to submit—giving, as before stated, its irrefragable demonstration of the absolute truth of the word of God in its testimony respecting His incarnate mercy in the person of 'Jesus the Prophet of Nazareth; of Gallilee.'"

STANZAS FROM "PHILITIS," OR THE SOLUTION OF THE MYSTERY WHICH FOR FOUR THOUSAND YEARS HAS SHROUDED THE GREAT PYRAMID IN EGYPT.

BY CHARLES CASEY.

Siriad ! the land of mysteries sublime !
 How Sihor's valley and its banks abound
 With proofs that reach back to the youth of time,
 Of art, skill, science, wisdom, high, profound,
 Unmatched in any age, or race or clime.
 Its temples, tombs and pyramids astound—
 From Thebaid's solemn grandeur to the site
 Where Jeezeh's structures guard historic night.
 * * * * *
 How in its presence modern pride is bowed !
 Its hoary wisdom whispering from the dead—
 Sublime, mysterious, awful—with the shroud
 Of forty centuries wrapped around its head,

We catch its muffled tones, now low, now loud,
And hear, with wonder nigh akin to dread,
The cosmic truths now by its stones revealed,
Which for four thousand years have lain concealed.

By its vast hugeness mind and eye are dazed
And into silence awed. We stare and stand,
Striving in vain to grasp *how* it was raised—
To comprehend the skill by which 'twas planned.
Pigmies in mind and stature, stunned, amazed,
We gaze and feel before that structure grand—
The mightiest altar that has ever been,
Which cannot be imagined until seen.

* * * * *

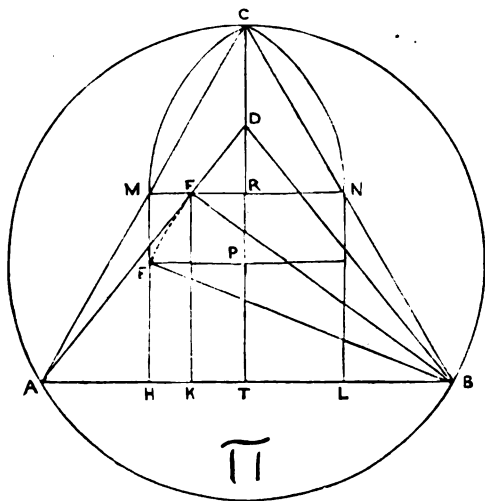
But as that hoary pile doth still devour
Its shadow daily, so it seems to hide
Its secret truths. Four thousand years its power
Appeared, with magic mystery allied,
Until at length came the appointed hour
When scientific search, so long defied,
Expelled the Genii of the powers of night,
And gave its prisoned secrets to the light.

Honor to Smyth! and all that noble band
Of scientific men, who gave their mind
To rescue from the desert's drifting sand
The greatest truth to modern times assigned—
A revelation grandest 'mid the grand
Of all that science gave to human kind ;
An honor to their nation, age and race,
Who have achieved what time can ne'er efface.

PI.

The value of π is found to within $\frac{1}{1000000}$ by the following geometrical construction. It gives the height of the Pyramid 5818.46, or one-sixth of an inch less than π gives, the geometrical base being 9139.871.

Construct the equilateral triangle ABC circumscribing the square $HLNM$. Through the centre of the triangle draw EP parallel to HL . With EB as a radius, describe the arc EF intersecting MN in F . Through F draw AD ; then $\frac{AT}{DT} = \frac{AK}{FK} = .7854$, which is the number commonly used for $\frac{\pi}{4}$.



Let $RN = 1$; then $CR = \sqrt{3}$, $CT = 2 + \sqrt{3}$, $BT = \frac{2 + \sqrt{3}}{\sqrt{3}}$
 $PT = \frac{1}{2}(2 + \sqrt{3}) = EH$, $EH^2 + HB^2 = EB^2 = FB^2$,
 $KB^2 = FB^2 - FK^2$ and $AK = 2 BT - KB$; hence $\frac{AK}{FK} =$
 $.7854$.

H. G. Wood.

PREFACE TO LIEUTENANT TOTTEN'S BOOK, 'AN
IMPORTANT QUESTION.'

The race to which these pages are dedicated is by blood, by letter and by the spirit, literally "called in Isaac's name." As Saxons, they are the lineal descendants of the "Saka-i-Sunnia," or "Sons of Isaac;" while, by the particular branch through which they derive their lofty genealogy, they are the posterity of Joseph, "the beloved son," to whom pertained their birthright.

The Egyptian extraction of his two sons, Ephraim and Manasseh, bequeaths to them, together with all the blessings "of him who was separated from his brethren," an inheritance none the less royal and significant in the mysterious land of their mother; Asenath, the daughter of Potiphera, prince of On." Though, like another and greater son of Jacob, it is true that they were, in early days, "called out of Egypt," it is none the less true that the summons was simply given to them for the purpose of extending the possibilities of their ultimate dominion.

In these latter days, when the ends of the earth seem literally to draw nigher to us, when every nation is so deeply impressed with the uncertainties surrounding the long contested solution of "the eastern question," when an intense and ever increasing expectancy has settled down upon the whole human race, it may well be asked if it is not a little remarkable to see the flags of these two *brother* nations united for the first time since their independence, in the streets of Alexandria? In 1882 the bronzed tars of England and America, of "brothers John and Jonathan"—the only nations called "brethren" upon the face of the earth—landed together on the shores of the delta of that ancient stream, upon whose banks their fathers, also brothers, had lived as princes twice eighteen centuries before. Shall we endeavor to convince ourselves that in this act there was no overruling exercise of that will which weaves the thread of destiny? Or shall we cease to doubt, and yield to the conviction that there is indeed a power that giveth the dominion unto whom it will?

In the same year, 1882, both England and America struck off commemorative medals, upon whose reverse faces the two most mysterious emblems of Egypt, the Sphinx and Pyramid, were severally displayed as central devices. In their inception these medals had not the remotest connection. The one was the Egyptian war medal of Great Britain; the other was the centennial seal medal of the United States. Nevertheless, a strenuous effort was made to induce the Queen to adopt the Pyramid as a central emblem for the British war medal. It had already been used by America that very year; and it was not likely that an occasion for its simultaneous employment by the two nations would soon, if ever again, occur. But Ephraim is not Manasseh, and so the idea of the Sphinx was adhered to by our fraternal nation as for it the most appropriate. Was Providence, which counts the hairs upon a human head, also an unconcerned spectator then? And were these matters really trivial things, and after all of no historic moment?

"There's a divinity that shapes our ends,
Rough hew them how we will."

And it was no accident that the greatest commercial city of each of these two brothers and Egyptian nations was at this time graced with one of the two obelisks that, when their father Joseph married the Princess Asenath, had stood, like Jachin and Boaz, in strength and beauty on each side the portal of her father's temple.

Who, indeed, shall say that, in youthful sports around the entrance to that noble shrine,

their fathers did not choose, as children do to-day, and even name as "Ephraim" and "Manasseh" each one, the self-same pillar, which, in centuries then to come, the powers that overrule have now brought by such natural means to the more modern homes of their descendants, and have stationed at the very gates of all their greatness?

There is undoubtedly an inheritance in the land of Egypt for the Anglo-Saxon race, and the day has dawned when it shall be given unto those whose right it is.

* * * * *

In our treatment of this subject, we shall first examine into facts which lie near home, and see in how much or in how little the Anglo-Saxon race is actually in possession of the blessings promised unto Ephraim and Manasseh as the sons of Joseph. We shall then ask our readers to accompany us through some studies of this remarkable monument, and by the way, shall gather not a little from the God-designed metrology of Israel, of highly scientific import.

The hierarchy of science so-called has long since agreed to disregard as totally unreliable every structure a single stone of whose foundation has been quarried from the eternal word of God. Any appeal to the Scriptures, no matter how modest, is so thoroughly at variance with the modern methods of philosophers that the book of an author who has searched the Scriptures for guidance towards the eternal truth of things, is condemned unread, stamped with the seal of disapproval unopened, and burned relentlessly without a hearing, lest the people, having read it, should pronounce it true and learn to disregard their would-be teachers.

But it is not to be expected that a book so full of stumbling blocks, offensive to their theories of evolution, as is the Bible, should find any favor or receive the least toleration at the hands of modern scholars. From the dust they love to feel that all around has risen, and without a God; and into the silt of a disintegrated, dead and formless universe, they trust at length their worn-out essences will sink into eternal sleep. Modern science, disguise it as we may, is thus at heart not merely far at sea upon the waves of doubt, but is essentially an atheistic school that has no God, and which has long since closed its doors against the written Word.

From this school, therefore, the present volume does not expect a single meed of praise, but here I am content. Were it to be otherwise—were recognition granted to the thoughts advanced by our self-styled scientific teachers—I should feel that the light in which these pages had been written was but an *ignus fatuus* from the swamp of things that soon must pass away. I write, however, for the people whose concern alone this matter is, and who still read the word with simple trust; and though my subject is of the highest scientific nature, I doubt not they will find it clear, as truth is ever to be found, and not so intricate but that it will be filled with what to every mind is deeply interesting, and also find it to be well within the scope of even moderate education and capacity.

As a matter of fact the Bible deals at great length with this very subject of metrology. Around it the whole of the Hebrew polity harmoniously arranges itself, and very naturally, too; for a just and perfect life was all it aimed at inculcating; and the very measure of fair dealing, of justice and truth, is centered in and squared and righted at an honest and an accurate standard, too sacred to be ever lengthened or diminished by any possibility of double dealing.

As the study of metrology inevitably leads us to the study of the Great Pyramid of Egypt, so, too, it leads all dwellers in the land of Manasseh to look with greater interest on the arms and crest and seal chosen for the nation's blazonry by ancestors who wrought more wisely than they knew. The United States of America has been a nation marked out by special manifestations of Divine Providence from their very beginning until now.

In was in their earliest struggles that they looked towards this western wilderness; and behold the glory of the Lord appeared in the cloud, and led them to their favored habitation. By faith, like Abraham their ancestor, when called upon to go out into a place

which they should afterwards receive for an inheritance, they obeyed and went out, not knowing whither they went, and dwelt in their land of promise as in a strange country. But the clouds of the Almighty were about their habitation, so that the sun smote them not by day, neither the moon by night. It is, therefore, in their crest they fittingly commemorate how by faith there sprang from even one, and him as good as dead, so many as the stars of the sky in multitude. It is, therefore, in their motto they repeat this reference, and intensify the idea of union by that beautiful allusion to the universal brotherhood of all mankind, who in Christ, as St. Paul truly says, are "many in one."

This was indeed the nation that fled into the wilderness borne upon eagle's wings—the goddess of liberty, clothed with the sun, bathed in the cloud-reflected colors of her flag, and crowned with the stars that marked the union of her States and pointed out their lofty origin. And her eagle guardian was the Lord of Hosts himself; for as an eagle stireth up her nest, fluttereth over her young, spreadeth abroad her wings, taketh them, beareth them on her wings, so the Lord alone did lead his people towards the land of freedom, and there was no strange god with him.

Truly, then, may all the nations of the earth exclaim, "Who is like unto thee, O people saved by the Lord, who is the shield of thy help? Thine enemies shall be subdued unto thee, and thou shalt tread upon their high places. In peace thou shalt be like unto thy father Joseph, a branch planted by the river of water that bringeth forth his fruit in his season; thy leaves also shall not wither, and behold whatsoever thou doest it shall prosper."

Then may Jeshurun, the wise people, fittingly reply, "There is indeed none like unto the God of Manasseh, who rideth upon the heavens in my help, and in His excellency on the sky, the eternal God is my refuge, and underneath are the everlasting arms."

Upon the reverse of our national seal the references to our birthright as descendants of Joseph and Manasseh, and thus of Egyptian origin, are even still more pointed. The leading motto—"Annuit Cœptis" ("He has prospered our beginnings")—is a direct use of an expression so often reiterated in the Bible story of Joseph, that he has become the very type of a prosperous man."

In the capstone we have again not only the emblem of that Divine Providence which crowned our efforts as a struggling people, but of the Saviour of his people, in whom alone our building, fitly joined together, groweth upwards into that perfect union of the human and divine. The building—a pyramid unfinished—an emblem of stability, of perfect measure, just weight, and of eternal truth, and harmony with nature, man and God, is eminently the Egyptian emblem of Manasseh. The date upon its base is his year of maturity—MDCCLXXVI., and marks the dawn of another golden age, as the motto below expressly indicates:

" *Novus ordo seclorum.*"

This motto is an intentionally altered quotation from Virgil's Fourth Eclogue, and was borrowed in turn by Virgil from the mystic Sybilline Records. The text opens as follows: (Translation):

"The last age of Cumean song now comes;
Novus ordo seclorum—a mighty order of ages is born anew.
 Both the prophetic virgin and Saturnian kingdoms now return;
 Now a new progeny is let down from the lofty heavens;
 Favor, chaste Lucina, the boy soon to be born,
 In whom the iron age shall come to end,
 And the golden one arise again in the whole earth."

Words would be exhausted in any attempt to do justice to the thoughts that find birth in the contemplation of the American era. Unique with the rest of the symbolism upon the long concealed face of our great seal, this motto comprehends in itself the whole of the

Virgilic Sybilline fragment just translated. It is unique in its reference to the birth and genius of American institutions—institutions that cannot pass away, and whose full development no hand can stay from reaching the goal of their most perfect realization. The new order of things has been let down from heaven, not again to be withdrawn from earth; but this motto is also most beautifully in harmony with the entire reverse of the seal itself; and it conceals a hidden reference to the Great Pyramid above—the legacy of an *earlier* golden age to ours.

In this, "the last age of Cumean song," it is our task to rebuild the monument of just weights and perfect measures. In the day of liberty, now fully dawned, the recognized equality of all demands, as the foundation of society, perfect justice in the dealings of man with man; and it is only in the rediscovery of the secrets of true pyramidal construction that the new order of the ages can be founded in stability.

When, at length, therefore, we Americans—as the children of Manasseh—have fully come to read our title clear to this inheritance, so grand and so far-reaching, how pointedly will the blessing of the great ancestor who adopted us—for we were half Egyptian—and made us equal to his own, be named and numbered on us.

"He, (Manasseh," said Jacob, when he blessed our fathers),"also shall be a great people." Thus he, whose name was changed to Israel, made us greater than his own; since from all he took the birthright, and conferred it upon the two adopted sons of Joseph—upon Ephraim and upon Manasseh, upon England and America; that is, upon the Anglo-Saxon race.

THE INTERNATIONAL CONGRESS TO DETERMINE A PRIME MERIDIAN.

OPENED AT WASHINGTON, OCTOBER 1, 1884.

AN ACT to authorize the President of the United States to call an international conference to fix on and recommend for universal adoption a common prime meridian to be used in the reckoning of longitude and in the regulation of time throughout the world.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the President of the United States be authorized and requested to extend to the governments of all nations in diplomatic relations with our own an invitation to appoint delegates to meet delegates from the United States in the city of Washington, at such time as he may see fit to designate, for the purpose of fixing upon a meridian proper to be employed as a common zero of longitude and standard of time reckoning throughout the globe; and that the President be authorized to appoint delegates, not exceeding three in number, to represent the United States in such international conference.

Approved, August 3, 1882.

The list of countries represented and their delegates, is as follows:

- Austria-Hungary—Baron Ignatz von Schaeffer, E. E. and M. P.
- Brazil—Dr. Luis Cruls.
- Colombia—Com. S. R. Franklin, United States Navy.
- Denmark—Mr. Carl Steen Andersen de Bille, Minister Resident and Consul General.
- France—Mr. A. Lefavre, M. P., and Consul General, Mr. Janssen.
- Germany—Baron H. von Alvensleben, E. E. and M. P., and Mr. Hinckeldeyn.

Great Britain—Capt. Sir F. G. O. Evans, Prof. J. C. Adams, Lieut. Gen. Strachey, Mr. Sandford Fleming.
Guatemala—Mr. Antonio Batres, E. E. and M. P., and Mr. Miles Roch.
Hawaii—Hon. W. D. Alexander and Hon. Luther Aholo.
Italy—Count de Foresta, Secretary of Legation.
Japan—Prof. Kikuchi.
Liberia—Mr. William Coppinger, Consul General.
Mexico—Mr. Leandro Fernandez and Mr. Angel Arguiano.
Costa Rica—J. F. Echeverria.
Netherlands—Mr. G. De Weckherlin, E. E. and M. P.
Paraguay—Mr. John Stewart, Consul General.
Russia—Mr. Charles De [Struve, E. E. and M. P., and Maj. General Stebnitzki, le Conseiller d'etat Actuel Kologrivov.
San Domingo—Mr. M. De J. Galvan, E. E. and M. P.
Spain—Juan Pastorin Juan Valera, Spanish Minister, and Emilio Ruiz del Arbol.
Sweden and Norway—Count Carl Lewenhaupt, E. E. and M. P.
Switzerland—Col Emile Frey, E. E. and M. P., and Prof. Hirsch.
Turkey—Tewfik Pasha, E. E. and M. P.
Venezuela—Senor Dr. A. M. Soteldo, Charge d'Affaires.
United States—Rear Admiral C. R. P. Rogers, United States Navy, Mr. Lewis M. Rutherford, Mr. W. F. Allen, Commander W. T. Sampson, United States Navy, and Prof. Cleveland Abbe.

A delegate to the Conference writes as follows :

WASHINGTON, October 23, 1884.

My Dear Sir : Yours of the 29th of September duly received. The metric system was brought up by the Spanish delegates, but it was ruled out of court by the chairman, and there it ended.

I enclose a copy of the resolutions passed. We had a final vote yesterday, after twenty-two days' cogitation and delay. The business is now over, and the world will have a universal time based on principles I have long advocated.

RESOLUTIONS.

In case the Conference shall not adopt the resolution proposing a neutral meridian, it is intended to introduce the following, and copies are distributed with the hope of saving time :

Resolved : That the Conference proposes to the Governments here represented the adoption of the meridian passing through the centre of the transit instrument at the Observatory of Greenwich as the initial meridian for longitude.

Resolved : That from this meridian longitude shall be counted in two directions up to 180 degrees, east longitude being plus and west longitude minus.

Resolved : That the Conference proposes the adoption of a universal day for all purposes for which it may be found convenient, and which shall not interfere with the use of local or other standard time where desirable.

Resolved : That this universal day is to be a mean solar day ; is to begin for all the world at the moment of mean midnight of the meridian coinciding with the beginning of the civil day and date of that meridian, and is to be counted from zero up to twenty-four hours.

Resolved : That the Conference expresses the hope that as soon as may be practicable the astronomical and nautical days will be arranged everywhere to begin at midnight.

Passed the 22nd of October.

LETTERS.

LETTER FROM S. BESWICK.

STRATHROY, ONTARIO, September 18, 1884.

My Dear Sir—I had partly determined not to write any more just yet, and lie still for awhile, but I at length concluded to send you this article, as a specimen of the outcome of my studies this summer.

I hold the opinion that we shall find the line of the casing sides overlapping the line of the sockets, and that the Expedition will discover the proofs on a careful search of the rock outside the sockets. A discussion of the point will do good. You will observe my claim in the article is clear and definite, that the geometrical basis is the true base, and the only actual base the Pyramid ever had. I do not accept any other base as the builder's base than 9139.8712; the geometrical base is the only base it ever had. This is my theory, and it is the only one that will stand the test of future and present investigation. But if we accept the socket-levels of Petrie as the corners of the Pyramid base, then the case is different. The more Mr. Wood, Mr. Skinner and others investigate and compute, the more they will get puzzled and fall into inconsistencies, fancies and speculations. The simple theory of a geometrical square of 9139.8712 inches to a side, as being the actual square of the Pyramid will relieve the mind from all difficulty, and, what is better than all, we shall then have a square which our formulæ can measure infallibly to the one million millionth of decimal figures, if we choose to be so very exact in our computations. I have given up Petrie's socket levels and side lengths as an authority, and have fallen back upon the formulæ of the Institute as the only reliable ones, as they give better and closer results, besides being more consistent with the interior measurements. I find no authority will do this but our own formulæ. For, on examining the most approved measurements of Petrie—approved by himself I mean—and the best measurements of the day, I find they are nothing more nor less than simple approximations to the results given by our formulæ. And thus I stand immovably fixed in our own standards.

I again conclude with the declaration that the original base of the Pyramid—the actual base which the builders placed on the hill of Gizeh—was identically the same as the geometrical base of 9139.8712 inches to a side, and that it had no other base. It was a perfect square with equal sides, and that the heel of the corner stones was placed in the socket, whilst the foot and front part of the casing stones overlapped the sockets on all the four corners.

Respectfully,

S. BESWICK.

LETTER FROM JOSEPH BAXENDELL.

August 7th, 1884.

My Dear Sir:—I have to-day received from some unknown friend in America a copy of *The Churchman*, of July 19, 1884, which contains a review of a paper entitled 'The Imaginary Metrological System of the Great Pyramid of Jeezeh,' by F. A. P. Barnard, LL.D., and it is deplorable to see in a periodical bearing the title of *The Churchman*,

such an exhibition of unchristian feeling and language as is shown in this review. No one earnestly seeking the truth and anxious to act without prejudice could write in the spirit displayed by the writer in the paper and his reviewer; nor speak of the common belief that the design and building of the Great Pyramid was of an inspired mind, as "imputing to the Supreme Ruler of the universe a project so wild, so cyclopean, so almost stupidly idiotic, as that of heaping up six and a half millions of tons of rough limestone blocks about a hollowed piece of granite which has been at the mercy of the tourist for centuries, mutilated and desecrated, in order that the English speaking races of the world might, in the nineteenth century, use a quart and a pound which have no direct relation to the length of a foot," nor could any one having a strict regard for the truth unblushingly write that "the Virgin Mary, herself resting at Matariah, and living at Heliopolis, might have learned the length of the human life of her Son by simply traversing part of the passage in the structure which confronted her Egyptian home," although, as the writer is no doubt aware, neither the Virgin Mary nor any one else knew of the existence of the passage referred to. When the advocates of a cause find themselves driven to attempt to support it by statements like these, it is evident they feel keenly the weakness of their case, and have little hope that it will meet with general acceptance.

With an utter disregard of the truth, it is stated by the reviewer that "the array of new facts which Petrie's book presents demolishes completely the pretensions of the Pyramid religion, and buries beyond all hope of resurrection the ingenious theories of Mr. John Taylor and Professor Piazzi Smyth," whereas Petrie's new facts have all given additional support to these theories and established them on a basis which is not likely to be shaken by all the "sound and fury" and irreverent language of disappointed anti-pyramidists.

In my letter of July 7, I believe I stated that the result of the Belgian observations of the last transit of Venus gave a sun distance of 91,756,800 British miles. In the report I had seen the resulting parallax was stated to be 8.909", but I find that in M. Houzean's complete report it is stated to be $8.911'' \pm 0.084''$, which gives the sun's distance = 91,731,600 British miles, or 105,400 miles less than the Pyramid distance which Dr. Barnard says "is only about a million of miles too short!" It remains to be seen whether he will now have the manliness to admit his error and retract his inconsiderate statement.

I remain, my dear sir,

Yours very truly,

JOSEPH BAXENDELL.

TRANSACTIONS OF THE OHIO AUXILIARY SOCIETY OF THE INTERNATIONAL INSTITUTE.

SEPTEMBER 10, 1884.

In consequence of the storm, only four persons were present. The meeting, therefore, adjourned after a brief discussion to September 24th.

SEPTEMBER 24, 1884.

Notwithstanding the opposition of the elements, a large audience assembled in the hall of the International Institute for Preserving and Perfecting Weights and Measures.

After the election of members the first business before the meeting was the reading of a letter from the Secretary of the New York and New Jersey branches of the International Institute, requesting that the members of the Institute in Cleveland would co-operate with those branches with regard to "an open letter to the President of the United States" and "argument by committee," which were brought before the notice of the society at a previous meeting. In Mr. Latimer's remarks upon this subject he explained the necessity for bringing the aims of the Institute before our representatives in view of the International Conference which will convene at Washington on October 1st. A letter was then read from George C. Mason, Secretary of the American Institute of Architects, requesting that a delegate from the International Institute might attend the meeting of architects in Albany, October 22d, to read a short paper, or give an oral description of the work of the society. Rev. H. G. Wood, of Sharon, Pennsylvania, was accordingly appointed to represent the society at Albany.

Mr. Latimer then gave a short exposition of the work of Lawrence McCurrick on "Planetary Motion." He demonstrated on the blackboard Mr. McCurrick's method of obtaining the relative distance of the planets by geometry, and showed some very close and curious arithmetical coincidences and relations. Professor Stockwell in his criticism admitted the ingenuity of Mr. McCurrick's method, but said that no effective practical result could be obtained by it.

Rev. H. G. Wood next showed the connection between ancient and modern measures and their geometrical proportions. He then read and illustrated a paper by F. A. R. Winter, of Demerara, British Guiana, on the "Sacred Chronology in Correlation with the Measures of the Great Pyramid." Rev. E. P. Ingersoll, of Rosevale, Kansas, was then introduced by the president, and lectured upon "The Identity of the Anglo-Saxons with the Lost Tribes of Israel."

The members elected were Charles E. Bliven, Toledo; J. R. Bryden, C. E., Demerara, British Guiana; John Forrest, M. D., Charleston, South Carolina; Mrs. Dr. Elmira G. Howard, Cincinnati; George C. Mason, Newport, Rhode Island; Jesse Opperman, C. E., Buffalo; George Engel, Cleveland.

OCTOBER 8, 1884.

In the absence of the president, Vice President A. M. Searles occupied the chair at the meeting of the International Institute for Preserving and Perfecting Weights and Measures. Mrs. D. White, Black Creek, Ohio, was elected a member. A letter was then read from George C. Mason, Secretary of the American Institute of Architects, expressing his satisfaction at the appointment of Rev. H. G. Wood as delegate from the International Institute to the convention of architects to be held in Albany, October 22d, 23d and 24th. Mr. Wood, who has just returned from Washington, wrote that at the second sitting of the International Conference there, the French repre-

sentative was not in favor of Greenwich meridian as the prime. The discussion was very warm. England and America would not consent to a change from Greenwich. It would cost the American government \$1,000,000 and the British £1,000,000 to alter the charts. Mr. Wood says: "I do not think we have anything to fear for the preservation of our weights and measures. If the International Congress do recommend the adoption of the French metre, there will be abundant and public opportunity to resist it when the subject comes before the United States Congress, but I believe our government has gone as far in the matter as it will go."

With reference to the International Conference Theo. Cribi sent an extract from a letter of Dr. Hirsh, who declined the appointment of representative of the Swiss government. He says: "I foresee, however, that the important reform, the unification of longitudes and time reckoning, for which I have worked a great deal, will not finally be settled in Washington, by reason of the French, who will create an opposition to it, and the probable absence from the Congress of the Germans, as well as by reason of the mistake the American railways have made in adopting in too great a hurry a bastard and irrational solution in introducing the system of hourly meridians, but to postpone is not to give up. The matter will be taken up again later, in a more propitious moment. An article from the *Philadelphia Ledger* from the pen of Coleman Sellers, who writes from Eisenach, was then read."

The reading of this paper was followed by a lively discussion, and it was recommended that it should be published in pamphlet form for circulation among manufacturers and machinists.

An article from Joseph Baxendell, astronomer, England, pointed out many fallacies in the papers of President Barnatd on pyramid metrology.

A paper was then read from H. W. Oswald, of San Francisco, California. The views of the writer were criticised by Dr. Redfield; Mr. A. M. Searles, Mr. W. Bond and other members. The discussion was very animated. The meeting adjourned for two weeks.

OCTOBER 22, 1884.

Vice President A. M. Searles acted as chairman in the absence of the President. Rev. Mr. Barber, Williston, Vermont, was elected an honorary member, and the Lady Georgiana Needham, Datchet, England; W. E. Chase, Holyoke, Massachusetts; Samuel C. Goodsell, Westville, Connecticut; C. B. Whyte, Hamilton, Canada; A. A. Jones, Williamstown, Massachusetts; and Henry Kellogg, New Haven, Connecticut, were elected members.

A discussion then took place with regard to the annual convention of the Society, and the following resolution was presented by the chairman and adopted: "The annual meeting of the Society will be held as follows: The 8th day of November is the duly appointed day for the purpose, but in view of the fact that the day following is the Sabbath, which will interfere with the attendance of some members from distant parts, the annual meeting will be held on Tuesday, the 11th of November, at the Society's rooms in Cleveland, Ohio. At this meeting the election of officers for the ensuing year will take place. A charter legalizing the Society's existence in the State of Ohio will be presented for adoption, and papers will be read and discussed."

All persons interested in the objects of the Institute will be welcomed at the convention. Members who are prepared to read papers on the occasion will please notify the President of their intention without delay. Accommodation will be provided for members from a distance.

Letters were then read from several members. J. E. Hilgard, of the United States Coast Survey, Washington, wrote with reference to the International Conference. He says: "You need not think that the convention will have any influence upon the adoption of the metric system. The definition of the power of this convention is so circumscribed that directly the metric question cannot be touched. Indirectly, England will doubtless

be so much complimented by the adoption of the Greenwich meridian as to make her become a party (as indeed she has already done) to the International Bureau of Weights and Measures near Paris, but she will not budge from the two-foot rule until long after the Americans have given up the Anglo-Saxon units—observe that we are much more facile in change than the English.

“The resolutions of this convention are a foregone conclusion. They will simply recommend Greenwich midnight and the reckoning half way round in each direction—in fact just what we are doing now. The whole business of the International Convention is gotten up in order to save the *amour propre* of such small countries as France and Spain (who have prime meridians of their own) by giving them an opportunity to accede to the expressed wishes of the whole world.”

This letter was received before the convention adopted Greenwich as the prime.

Mrs. E. Bedell Benjamin's paper on “The Sphinx” was then read by the Secretary. It was heard with rapt attention and occasioned a spirited discussion, in which Mrs. A. M. Searles, Dr. Redfield, Mr. Joslyn and others expressed their views. The meeting then adjourned till November 5th.

TRANSACTIONS OF THE NEW YORK AND NEW JERSEY BRANCH OF THE INTERNATIONAL INSTITUTE.

An important regular meeting was held at room No. 24 Cooper Union, New York City, on the evening of September 24, 1884. The meeting was called to order by Vice President Kellogg, who invited Lieut. C. A. L. Totten to act as secretary pro tem, in the absence of Mr. J. N. Wing. Present at the meeting and taking part in its discussion were representatives from several leading architectural, mechanic and physical societies, who had come together to confer upon the metrological questions now before the country, in reply to a printed circular sent out requesting such attendance.

After the usual routine of business, during which the chairman detailed the objects of the International Institute to the visitors, Colonel Chester, chairman of the committee to correspond with the Executive of the United States relative to the appointment of delegates to the International Congress on Prime Meridian, made his report. Colonel Chester then discussed the subject in general as correlated with metrics, and the necessity of a nomenclature and method in the technology of forces, etc., and of computing longitude and time. During the evening extended remarks were made, in order, by the following named gentlemen: Rev. A. D. Barker, Jacob M. Clark, C. E., and Mr. O. P. Hatfield, Treasurer of American Institute of Architects. The remarks of all these gentlemen were of the most interesting and important nature.

At the termination of the remarks the following resolutions were passed by those present:

Resolved: That it is the sentiment of this meeting that the International Convention called by the United States Congress for the purposing of determining upon a standard meridian, has no right to go beyond its commission and discuss, even as a measure of compromise, any system of weights and measures.

Resolved: That the thanks of this Institute be extended to the press for co-operation and notices of our meetings.

Resolved: That this Institute appreciates with thanks the courtesy of the *New York Evangelist*, and the *New York Observer* extended in behalf of the objects of our association.

Resolved: That special thanks be proffered to Rev. A. D. Barber, of the *New York Observer*, for important investigations, and for his valuable and instructive address this evening.

Resolved: That Rev. A. D. Barber, B. S. Church, C. E., Jas. Kitchen, Esq., Geo. Henry Felt, C. E., Chas. K. Graham, C. E., and C. W. Havemeyer, Esq., be constituted honorary members of this Branch, and that the secretary be instructed to forward them copies of this resolution.

There being no further business before the meeting, it adjourned to come together at the call of the President.

C. A. L. TOTTEN, U. S. A.,
Secretary Pro Tem.

EDITORIAL NOTES.

Important papers, read at a meeting of the New York and New Jersey Branch of the International Institute, by Colonel Stephen M. Chester, Jacob M. Clarke, C. E., Lieut. C. A. L. Totten, Rev. A. D. Barber and Mr. O. P. Hatfield, arrived too late for publication in this number. We hope to present them to our readers in a subsequent issue.

In consequence of a press of matter we are obliged to postpone the publication of able papers by J. K. Hornish, H. W. Oswald, Rev. H. G. Wood and F. Hess; also, of a large number of important letters and the systems of tables that we proposed to compare in this issue. For the same cause we have held over a portion of Mr. Latimer's paper on "The Unveiling of Isis." It contains some wonderful prophecies concerning America, chiefly gleaned from Charles Sumner's work, with a graphic summing up by Mr. Latimer.

My friends, members of the Institute and readers of the Magazine, I promised in my last to present you my investigation touching the relation of the subject of Isis to my theme, and to conclude, but moved by the advice of my friends not to omit any part of the details of the incidents which have occurred in my experience, and called suddenly away from my home and place of business, here, upon the rocky mountains in Idaho, overlooked by the hoary peaks, covered with eternal snows, which rear their heads above us, surrounded by hardy miners, who,

with their engines and drills and hammers, are perforating and piercing the mountains upon every side, and drawing therefrom their hidden treasures, which are now bringing our country up to the highest point of wealth and prosperity and fulfilling the visions and dreams of our voices, prophets and poets, yet to be extended farther than the imagination of poet or sage ever dreamed or thought, I have departed from my programme and present you another chapter. It shall be for you to judge whether they are words in the right place. In the next paper, if possible, I will conclude, presenting you with those mysterious links in the chain of evidence which, I feel sure, will prove that our country was the burden of the myths, the glory of the constellations, the song of the poet, and the inspired words of the prophet of the Lord.

CHARLES LATIMER.

REVIEWS.

THE WORD, THE WORLD, THE BRANCH. By J. Leyland Feilden, Esquire, author of "Links in the Chain of Evidence Connecting Israel and England;" "The Gentiles and the Times of the Gentiles;" "Israel Jubilee, or 1882;" "Israel Ubiquitous," Etc., Etc.

Mr. Charles Latimer sends us from Idaho Springs, Colorado, a comprehensive review of this book, which we will present in our next issue. Mr. Feilden is a member of our Institute, earnestly devoted to its objects. We ask his fellow members to give his works a hearing. They are published by Robert Banks, Racquet Court, Fleet Street, London, England. It is a most remarkable work, and we tender our grateful acknowledgment to the author for his consideration and attention in sending it to us.

We call the attention of our readers to an able work by J. P. Weethee, Millfield, Ohio, "The Coming Age; Its Nature and Proximity." Price \$3.00. The book can be obtained from its author, or from C. H. Jones, No. 77 Clark St., Chicago, Ill.

PROF. VAIL'S THEORY.

After examining this Theory we feel disposed to place some of its important features before our readers. Ten years ago Mr. Vail published a little volume, entitled 'The Waters Above the Firmament,' which was intended to show that the earth at

one time possessed an annular system, or system of rings and belts of aqueous vapors and other matter, similar to Saturn and Jupiter. A second edition, greatly enlarged, is now being prepared for publication.

He first assumes, what no scientist will dispute, that if the earth ever was in a molten state, all the waters now on its surface were in a vaporous form in a vast atmosphere of great complexity of materials. He next by a mathematical and philosophical demonstration proves that if the earth revolved with this great atmosphere, at least once in twenty-four hours, it must have thrown these vapors into rings over the equator.

Having thus established himself upon a rock apparently impregnable, he proceeds step by step, fortifying every inch of his progress, until he leaves the reader without the shadow of a doubt that another grand truth has been discovered. He shows how the innermost ring must have been the heaviest on account of the heavy materials that impregnated the vapors and settled nearest the earth, and, descending to its surface in the first ocean, formed the first sedimentary rocks—the metaliferous rocks of Archaen time.

He shows how the terrestrial heavens became clear again and again, and again and again became over-canopied by vapors descending from equatorial rings. That when a ring of vapors descended into the atmosphere it spread from the equator toward the poles, forming a great greenhouse roof over the world, annihilating the change of seasons and preventing the alternation of day and night on account of the universal diffusion of solar heat and light, and thus becoming a competent cause of all the climatological changes of geologic times, from the ages of eternal spring to those of eternal ice and snow. He shows most conclusively that all the glacial epochs were occasioned by mighty downfalls of these telluris-cosmic vapors in the polar regions. He shows that the dark belts of Jupiter and Saturn are *unconsumed carbon* lifted to their present position from those burning orbs. Says he, "A molten world must have been a smoking world, but a smoking world produced *soot* or *unconsumed carbon*; but soot or carbon must become a *bituminous oxydized* hydro-carbon in contact with air or aqueous vapor, and as the earth *was* a molten mass it subsequently had belts of carbonaceous matter that did descend on the earth, whose very presence is demanded by inexorable law to account for the coal formations of the world."

He shows that every geological age was introduced first by a wide-spread fall of waters, followed by continental upheaval and rock plication, which can only be explained by an augmen-

tation of oceanic waters. This he makes so plain that even a child can see that it must be true.

When the geologic ages have closed, he simply *proves* apparently beyond a peradventure, that the last or outermost ring of vapor descended into the air and spread as at other times from the equator to the polar regions in its effort to reach the earth, causing all the phenomena alluded to in Genesis, and here our author shows himself complete master of the situation by harmonizing every minutia with *law*. The six days of creation are explained on principles unthought of before. Eden and its entire field of mysteries assume a grandeur before unknown. The deluge becomes a philosophic necessity.

Over all this the reader must stand astonished and amazed; we simply confess our surprise at the unspeakable harmony (proven as it is by the very light of law), existing between Genesis and the book of nature. It becomes the duty of every student of nature—nay, of every man, woman and child to read and examine this great work of Prof. Vail's, who has promised us to publish his book of 400 octavo pages as soon as he can be sure of selling 1,000 or more copies. Let the readers of the STANDARD send their pledges to him at Barnesville, Ohio. The book will not cost over \$2.00, possibly less.

MONTHLY RECEIPTS FROM SUBSCRIBERS TO THE INTERNATIONAL STANDARD FROM SEPTEMBER 1ST TO OCTOBER 31ST.

SEPTEMBER—Mrs. D. White, \$10; Herbert Wallis, \$10; Dr. John B. Kellogg, \$10; E. Coombs, \$2; George Cheesman, \$2; Jesse Opperman, C. E., \$2; Mrs. Lucretia R. Garfield, \$2; Dr. John Forrest, \$3; B. F. Morse, C. E., \$2; F. A. R. Winter, \$15; Geo. Engell, \$2; Jonas Pierce, \$5; John B. Jervis, C. E., \$5; A. H. Stebbins, \$2; W. K. McAllister, \$1; R. W. Burnett, \$25; A. M. Searles, \$3.50—Total, \$101.50.

OCTOBER—Henry Kellogg, \$4.99; Lieut. Walter Alexander, \$2; Lady Georgiana Needham, \$2.03; Lieut. W. L. Buck, \$2; A. A. Jones, \$2; W. E. Chase, \$4; C. B. Whyte, \$4; Samuel Goodsell, \$2; J. Hornish, \$2; P. O. Box, Keelville, Kansas, .20—Total, \$25.22.

THE
INTERNATIONAL
STANDARD

A MAGAZINE

DEVOTED TO THE DISCUSSION AND DISSEMINATION OF THE WISDOM CONTAINED
IN THE

GREAT PYRAMID OF JEEZEH IN EGYPT

JANUARY, 1885.

ISSUED BIMONTHLY. PRICE 35 CENTS

TERMS OF SUBSCRIPTION AND MEMBERSHIP, \$2.00 PER ANNUM IN ADVANCE:

The International Institute as a body is not responsible for the facts or the opinions put forth by any of the writers for this Magazine.

Until the articles of incorporation are taken out, this Magazine is published on the responsibility of Charles Latimer, therefore neither the members individually nor the Society as a body assume any liability.

All in favor of advancing truths most absolute, as portrayed in the revelations of the Great Pyramid of Egypt, and of the success of the Society in preserving inviolate the Anglo-Saxon weights and measures, will kindly communicate with the President, by whom also subscriptions, donations and communications will be gratefully received.

THE INTERNATIONAL INSTITUTE

FOR PRESERVING AND PERFECTING THE ANGLO-SAXON WEIGHTS AND MEASURES

CLEVELAND: 64 EUCLID AVENUE

INTERNATIONAL INSTITUTE FOR PRESERVING AND PERFECTING WEIGHTS AND MEASURES.

FOUNDED NOVEMBER 8, 1879.

CHARLES LATIMER, President, Cleveland, O.

LUCIAN I. BISBEE, Vice President, Boston, Mass.

A. M. SEARLES, Treasurer, Cleveland, O.

MARY B. SANFORD, Secretary, Cleveland, O.

PUBLISHING COMMITTEE.

CHARLES LATIMER, C. E. } Editors. J. H. DOW. J. W. REDFIELD, M. D.
H. C. THOMPSON, } W. W. WILLIAMS. J. A. BIDWELL.
MRS. A. M. SEARLES. MARY B. SANFORD.

COMMITTEE ON WEIGHTS AND MEASURES.

REV. H. G. WOOD, Chairman of Committee, Sharon, Pennsylvania.

PROF. C. PIAZZI SMYTH, Astronomer Royal for Scotland, Edinburgh, Scotland.

J. RALSLOM SKINNER, Cincinnati, Ohio.

J. F. HILGARD, U. S. Coast Survey, Washington, D. C.

PROF. N. B. WOOD, Cleveland, Ohio.

PROF. ALFRED TAYLOR, Philadelphia, Pennsylvania.

SAMUEL BESWICK, C. E., Strathroy, Canada.

JACOB M. CLARK, C. E., New York.

CHARLES LATIMER, C. E., Cleveland, Ohio.

LIEUTENANT C. A. L. TOTTEN, Garden City, Long Island.

W. H. SEARLES, C. E., Cleveland, Ohio.

S. F. GATES, M. E., Cambridgeport, Massachusetts.

J. K. HORNISH, Denver, Colorado.

PROF. STOCKWELL, Cleveland O.

PROF. ROGERS.

COL. CHESTER.

WILLIAM W. WILLIAMS, PRINTER.
145 and 147 St. Clair Street, Cleveland, Ohio.

THE INTERNATIONAL STANDARD

JANUARY, 1885.

THE UNVEILING OF ISIS.

VII.

THE UNITED STATES OF AMERICA IS THE KINGDOM OF HEAVEN WHICH JESUS CHRIST CAME TO ESTABLISH UPON THE EARTH.

Turning now to Charles Sumner's 'Prophetic Voices Concerning America,'* the first lines of his monograph are as follows:

"THE DISCOVERY OF AMERICA BY CHRISTOPHER COLUMBUS IS THE GREATEST EVENT OF SECULAR HISTORY."

On the title page is the following: "I have a far other and far brighter vision before my gaze. It may be but a vision, but I will cherish it. I see one vast confederation stretching from the frozen north, in unbroken line to the glowing south, and from the wild billows of the Atlantic westward to the calmer waters of the Pacific main; and I see *one people* and *one law* and *one language* and *one faith* over all that wide continent—the home of FREEDOM and a refuge for the oppressed of every race and of every clime."—JOHN BRIGHT'S speech at Birmingham, December 18, 1862. Speeches by Rodgers, Vol. 1, p. 225.

Of the following prophetic voices the author says: "Brought

*Published by Lee & Shepard, Boston; Lee, Shepard & Dittingham, New York.

together in one body, on the principle of our national union—*E Pluribus Unum*—they must give new confidence in the destinies of the Republic.” From these I glean a few of the more remarkable.

“Foremost among the ancient prophecies are the well known verses of Seneca, so interesting from ethnical genius and a tragic death, in the chorus of his *Medea*, which for generations has been the finger-point to an undiscovered world.” “A prophecy of the discovery of America”—and this they may well be, if we adopt the translation of Archbishop Whately, in his notes to the *Essay on the Prophecies*”:—

“There shall come a time, in later years, when ocean shall relax his chains and a vast continent appear, and a PILOT shall find new worlds and THULE shall be no more earth-bound.”

Fox, writing to Wakefield, says: “The prophecy in Seneca’s *Medea* is very curious indeed. These verses were adopted by Irving as a motto on the title page of the revised edition of his ‘*Life of Columbus*.’”

Four, if not more, copies are extant in the undoubted hand-writing of Columbus—two in his work on the prophecies, another in a letter to Queen Isabella, and still another entered among his observations of lunar eclipses at Hayti and Jamaica.

Before the voyage of Columbus two Italian poets seem to have beheld the unknown world. The first, Petrarca,

“The daylight hastening with winged steps
Perchance to gladden the expectant eyes
Of far-off nations in a world remote.”

The other, Pulci, who, in his *Morganta Maggiore*, sometimes called the last of the romances and the earliest of Italian epics, reveals an undiscovered world beyond the pillars of Hercules.

“Know that this theory is false; his bark
The daring mariner shall urge far o’er
The western wave, a smooth and level plain
Albeit the earth is fashioned like a wheel.
Man was in ancient days of grosser mould,
And Hercules might blush to learn how far
Beyond the limits he had vainly set
The dullest sea-boat soon shall wing her way.”

“Men shall descry another hemisphere,
Since to one oommon centre all things tend;

So earth, by curious mystery divine,
Well balanced hangs amid the starry spheres.
At our antipodes are cities, states
And thronged empires, ne'er divined of yore,
But see the sun speeds on his western path,
To glad the nations with expected light."

And Drayton :

" And ours to hold
Virginia
Earth's only paradise."

And George Webb, '1728 :

" Rome shall lament her ancient fame declined
And Philadelphia be the Athens of mankind."

Milton, in 1641 :

" What numbers of faithful and free-born Englishmen and good Christians have been constrained to forsake their dearest home, their friends and kindred, whom nothing but the wide ocean and the savage deserts of America could hide and shelter from the fury of the bishops! O, if we could but see the shape of our dear Mother England as poets are wont to give a personal form to what they pleased, how would she appear, think ye, but in mourning weeds with ashes upon her head and tears abundantly flowing from her eyes, to behold so many of her children expelled at once and thrust from things of dearest necessity because their conscience could not assent to things which the bishops thought indifferent. Let the astrologer be dismayed at the portentous blaze of comets and impressions in the air as foretelling troubles and changes to States; I shall believe there cannot be a more ill-boding sign to a nation (God turn the omen from us) than when the inhabitants, to avoid insufferable grievances at home, are enforced by heaps to forsake their native country."

And Herbert, in 1600:

"Religion stands on tip-toe in our land,
Ready to pass to the American strand."

This may well suit the idea of a woman fleeing upon the wings of an eagle toward the west.

The poet died in 1632, twelve years after the landing of the Pilgrims at Plymouth, and only two years after the larger movement of the Massachusetts Company which began the settlement of Boston.

Fuller, writing a little later, was, perhaps, moved by Herbert when he said: "I am confident that America, though the youngest sister of the four, is now grown marriageable, and daily hopes to get Christ for her husband by the preaching of the gospel."

This calls to my mind the scripture: "The land shall no more be called Hepzibah, but Beulah (married).

And Abraham Cowley, in 1667:

Meanwhile, your rising glory you shall view,
Wit, learning, virtue, discipline of war,
Shall for protection to your world repair
And fix a long illustrious Empire there.

Sir Thomas Brown, 1630, probably:

When New England shall trouble new Spain,
When Jamaica shall be lady of the isles and main,
When Spain shall be in America hid,
And Mexico shall prove a Madrid;
When Africa shall no more sell out their blacks
To make slaves and drudges to the American tracts;
When America shall cease to send out its treasure,
But employ it at home in American pleasure,
When the New World shall the Old World invade,
Nor count them their lords but their fellows in trade—
Then, think strange things have come to light
Whereof but few have had a foresight.

Bishop Berkeley, 1726:

"Pope let drop a tribute which can never die:

'To Berkley every virtue under Heaven.'

"Such a person was naturally a seer."

"In distant lands now waits a better time,
Producing subjects worthy fame."

"Westward the course of Empire takes its way,
The first four acts already past;
A fifth shall close the drama with the day,
Times's noblest offspring is the last."

It is difficult to exaggerate the value of these verses, which have been so often quoted as to become a commonplace of literature and politics. There is nothing from any oracle, there is very little from any prophecy, which can compare with this.

A famous improvisatoire to the great artist Benjamin West, 1760:

"But all things of heavenly origin, like the glorious sun, move

westward; and truth and art have their periods of shining and of night. Rejoice thou, O venerable Rome, in thy divine destiny; for though darkness overshadow thy seats, and though thy mitred head must descend into the dust, *thy spirit immortal and undecayed already spreads towards a new world.*"

Drilled into a rock on the shore of Monument Bay in our old colony of Plymouth:

"The Eastern nations sink, their glory ends,
And empire rises where the sun descends."

Samuel Sewall, 1727:

"Berkeley saw the sun of empire travelling westward. A cotemporary whose home was made in New England, Samuel Sewall saw *the new heaven and the new earth*. He may be called our first abolitionist."

This is remarkable, taken in connection with the words of Columbus: "I am the messenger of the new heaven and the new earth mentioned in the Apocalypse of St. John and in the Prophecies of Isaiah, and the Lord told me where to find it."

In 1713 Sewall wrote with the following title:

"*Phænomena quædam Apocalyptica ad aspectum Novi Orbis Configurata*, or some few lines towards a description of the New Heaven as it makes to those who stand upon the New Earth, by Samuel Sewall, A. M., and some time Fellow of Harvard College, at Cambridge in New England."

This is followed by verses from the Scriptures, among which is Isaiah xi: 14: "*But they shall fly upon the shoulders of the Philistines toward the west*;" and,

"*And one that has been born or has lived in America more than three score years, it may be pardonable for him to ask, Why may not that be the place of the NEW JERUSALEM?*" and,

"*Of all the parts of the world which do from this charter entitle themselves to the GOVERNMENT OF CHRIST, America's plea in my opinion is the strongest.*" For when once Christopher Columbus had added this fourth to the other *three* parts of the foreknew world, they who sailed further westward arrived but where they had been before. The globe now failed of offering anything new to the adventurous traveller; or, however, it could not afford another new world. And probably the consideration of

America's being the beginning of the East and the end of the West, was that which moved Columbus to call some part of it by the name of ALPHA AND OMEGA. *Now, if the last Adam did give order for the engraving of his own name upon this last earth,* 'twill draw with it great consequences; even such as will, in time, bring the poor Americans out of their graves and make them live."

Again he says:

"May it not with more or equal strength be argued New Jerusalem is not the same with Jerusalem; but as Jerusalem was to the westward of Babylon, so New Jerusalem must be to the westward of Rome to avoid disturbance in the order of mysteries."

Afterwards he adduces, learned Mr. Nicholas Fuller, the extract of this new authority is remarkable for its indication to Columbus of the name of the new continent, as follows:

"Which everywhere they call America; truly and deservedly they should say rather COLUMBINA, from the magnanimous Christopher Columbus, the Genoese, first explorer and plainly divinely appointed discoverer of these lands."

Commenting upon this, very soon thereafter he breaks forth in words printed in large italic type and made prophetic:

"Lift up your heads, O ye gates (of Columbina), and be ye lifted up ye everlasting doors and the King of Glory shall come in."

It is a strange coincidence that one evening, at our Society meeting, I, feeling deeply impressed with the importance of our work, used the same verse, with the thought that it refers to our land, *America*.

The Marquis d'Argenson, 1745:

*"Another great event to arrive upon the round earth is this. The English have in Northern America domains great, strong, rich, well-regulated. There are in New England a parliament, governors, troops. I say some bright morning these dominions can separate from England, rise and erect themselves into an independent republic. What will happen from this? Such a country in several ages will make great progress in population and in politeness; such a country will render itself in a short time *master of America*, and especially of the gold*

mines." * * * "A day will come when one will go in a populous and regulated city of California, as one goes in the stage-coach of Meaux."

How wonderful, when considered that these words were written in, or near, 1745.

How little, however, should our good *old mother* England feel jealous or troubled over these things now of the past, for surely are we not Joseph sent a little in advance to prepare a place for her and her children, our brethren taking in all the children of Eve—the rest of mankind.

Turgot, 1770 :

"As a citizen of the world, I see, with joy the approach of an event which, more than all the books of philosophers, will dissipate the phantom of commercial jealousy. I mean the separation of your colonies from the mother-country, WHICH WILL BE FOLLOWED SOON BY THAT OF ALL AMERICA FROM EUROPE. * * * *The asylum which it opens to the oppressed of all nations must console the earth.*"

Horace Walpole, 1774 :

"But there is an ostrich egg laid in America where the Bostonians have canted three hundred chests of tea into the ocean, for they will not drink tea with our Parliament. * * * Lord Chatham talked of conquering America in Germany. I believe England will be conquered some day in New England or Bengal." Send for Lord Chatham! They had better send for General Washington, or, at least, call our troops back. *I own there are very able Englishmen left, but they happen to be on t'other side of the Atlantic.*

"Liberty has still a continent in which to exist. I do not care a straw who is minister in this slandered country. It is *the good old cause of Liberty* that I have at heart."

"*Old England is safe—that is—America, whither the true English retired under Charles I.*"

John Adams, 1756 :

"Soon after the Reformation, a few people came over into this New World for conscience sake. *Perhaps this apparently trivial incident may transfer the great seat of Empire to America; it looks likely to me.*"

“I always consider the settlement of America with reverence, as the opening of a grand scene and design in providence for the illumination of the ignorant and the emancipation of the slavish part of mankind all over the earth.”

“I am well aware of the toil and blood and treasure that it will cost us to maintain this declaration (Independence, July 2, '76) and support and defend these States. Yet, through all the gloom, I can see the ray of ravishing light and glory, and that posterity will triumph in that day's transaction.” * * *

“You must know that I have undertaken to prophecy that English will be the most respectable language in the world, and the most universally read and spoken in the next century, if not before the close of this.”

In reading this I am reminded of the words of the prophet: “They shall not be of a deeper speech than thou canst understand;” and I am moved to say also I predict that not only will the English language be the universal language, but that its system of weights and measures will so likewise be the universal system.

“A prospect into futurity in America is like contemplating the heavens through the telescope of Herschel. Objects stupendous in their magnitudes and motions strike us from all quarters and fill us with amazement.”

* * “*Our pure, virtuous, public-spirited, federative republic will last forever, govern the globe and introduce the perfection of man.*”

Abbé Raynal, 1770:

“Let the English clear the land, purify the air, change the climate, meliorate nature—a new universe will proceed from their hands for the glory and happiness of humanity.”

Jonathan Shipley, 1773:

“My lords, I look upon North America as the only great nursery of freemen now left upon the earth.”

“The true art of government consists in not governing too much.”

Dean Tucker, 1774:

“Rather let the seat of empire be transferred, and let it be fixed where it ought to be, namely, in great America.”

“Must they not, in the nature of things, cover in a few ages that immense continent like a swarm of bees?”

David Hartley, 1775 :

“*Let the only contention henceforward between Great Britain and America be, which shall exceed the other in zeal for establishing the fundamental rights of liberty for all mankind.*”

May the Lord grant this spirit to both peoples.

“*The fate of America is cast. You may bruise its heel, but you cannot crush its head. It may revive again. The New World is before them. Liberty is theirs.*”

Belonging to the Latin race, Galeani was entitled to speak thus freely :

“*The epoch has come of the total fall of Europe, and of transmigration to America.*”

Dr. Richard Price, 1784 :

* * * “*A new era in future annals and a new opening beginning among the descendants of Englishmen in a New World. A rising empire extended over an immense continent without bishops, without nobles and without kings.*”

Governor Pownal, 1777 :

To Franklin:—“I congratulate you in particular, as chosen by Providence to be a principal instrument *in this great Revolution*—A REVOLUTION THAT HAS STRONGER MARKS OF DIVINE INTERPOSITION SUPERSEDING THE ORDINARY COURSE OF HUMAN AFFAIRS THAN ANY OTHER EVENT WHICH THIS WORLD HAS EXPERIENCED.”

Cerisiet, 1778–1780 :

Then addressing Englishmen directly, the Frenchman thus counsels :

“Englishmen ! It is necessary for you to submit to your destiny. To avoid giving them anxiety and to prevent all dispute in the future, have the courage to abandon to them the surrounding countries which have not yet thrown off your yoke. * * * Let Canada make a fourteenth Confederate State.”

Never let it be with blood shed, we trust, but with a blessing to mother and child.

The Abbe Gregoire, 1808 :

“The American Continent asylum of liberty is moving

towards an order of things which will be common to the Antilles, and the cause of which all the powers combined cannot arrest."

This vigorous language is crowned by a prophecy of singular extent and precision when, after dwelling on the influences at work to accelerate progress, he fortells the eminence of our country.

"When an energetic and powerful nation, to which everything presages high destinies, stretching its arms upon the two oceans, Atlantic and Pacific, shall direct its vessels from one to the other side by an abridged route—it may be in cutting the Isthmus of Panama; it may be in forming a canal communication, as has been proposed, by the river St. John and the Lake of Michigan—it will change the face of the commercial world and the face of empires. Who knows if America will not then avenge the outrages she has received, and if our old Europe placed in the rank of a subaltern power, will not become a colony of the New World?"

Thus resting on the two oceans with a canal between, so that the early "secret of the strait" shall no longer exist, the American Republic will change the face of the world, and perhaps make Europe subaltern. Such was the vision of the French abolitionist lifted by devotion to humanity.

Of all the predictions in the book this is the most portentous: "The tongue of the Egyptian sea has been destroyed and the Suez canal has fallen into the hands of one branch of the family which possess the gates. And now the same spirit is endeavoring to set up a barrier to the domination of the Anglo-Saxon whose dominion has been predicted to extend from the 'icy capes of Labrador to the Spaniard's land of flowers,' and again to take in as one brotherhood co-equal all the realms to the frowning battlements of Cape Horn. The Panama canal is to present that barrier, but upon this question will come the mighty struggle, which *'will change the face of the commercial world and the face of empires.'*"

George Canning, 1826:

"The Monroe doctrine, as now familiarly called, proceeded from Canning; he was its inventor, promoter and champion, at least, so far as it bears against European intervention in Ameri-

can affairs. Earnestly engaged in counteracting the designs of the Holy alliances for the secretion of the Spanish colonies to Spain."

* * * "With mingled ardor and importunity the British minister pressed his case. At last after much discussion in the Cabinet at Washington, President Monroe accepting the lead of Mr. Canning, and with the counsel of John Quincy Adams, put forth his famous declaration, where after referring to the radical difference between the political system of Europe and America, he says that we should consider any attempt on their part to extend their system to any portion of this hemisphere as dangerous to our peace and safety, and that when Governments have been recognized by us as independent 'we could not view any interposition for the purpose of oppressing them, or controlling in any other light than as a manifestation of an unfriendly disposition toward the United States.'"

The message of President Monroe was received in England with enthusiastic rejoicing.

Said Canning:

* * * * * "I called the New World into existence to redress the balance of the old."

"If the republics of Spanish America, thus summoned into independent existence, have not contributed the weight thus vaunted, the growing power of the United States is ample to compensate deficiencies on this continent. There is no balance of power it cannot redress."

Alexis de Tocqueville, 1835:

"So in the midst of the uncertainty of the future there is, at least, one event which is certain: At an epoch which we can call near, since it concerns the life of a people, the Anglo-Americans alone will cover all of the immense territory comprised between the polar ice and the tropics; they will spread from the shores of the Atlantic even to the coasts of the Southern Seas."

"There will then arrive a time when there will be seen in North America one hundred and fifty millions of men equal together, who will all belong to the same family, who will have the same point of departure, the same civilization, the same

language, the same religion, the same habits, the same manners, and over which thought will circulate in the same form and paint itself in the same colors. ALL ELSE IS DOUBTFUL, THIS IS CERTAIN. Here is a fact entirely new to the world, of which imagination can hardly seize the extent."

No American can fail to be strengthened in the future of the republic by the testimony of De Tocqueville. Honor and gratitude to his memory.

Richard Cobden, 1852:

"I agree with you that nature has decided that Canada and the United States must become one for all purposes of free outer communication.."

Why should he not have said the mother-country too, for are we not brethren. Conquest should never be breathed amongst us. National jealousy should never be tolerated, except the jealousy for right doing. Is not the Land of Liberty for all? Is there sacrifice in coming into one fold as brethren? If the Lord has set up his kingdom, then, as children of the kingdom, our hearts and arms should reach out to all. Why should not our prayers ascend for that gracious and noble woman the queen of Great Britain, Ireland and Scotland and empress of India. The Lord pulls down and he builds up the fortunes of individuals as well as nations. Why should not our prayers ascend for the prosperity of all kingdoms and powers, and that all should prosper that do his will. Firm in our conviction in the eternity of the government founded upon civil and religious LIBERTY which we possess, whilst we should guard its temple, our hearts and sympathies should go out to all of the nations of the globe of whatever kind with as broad and comprehensive a prayer as that of the Huguenots for that dreadful prince, the scourge of Almighty God to them, Louis XIV. For we know that all kingdoms and powers and peoples and races must become the followers of the Lord Jesus Christ and parts of his kingdom when he shall reign over the whole earth.

But I will pass on to the last quotation that I shall make from this invaluable contribution to our literature.

Lucas Alaman, Mexican statesman and historian, 1844:

It is on account of the valedictory words of this historian that I introduce the name of Alaman, and nothing more striking appears in this gallery. Behold:—

“Mexico will be without doubt a land of prosperity from its natural advantages, *but it will not be so for the races that now inhabit it.* As it seemed the destiny of the peoples who established themselves therein at different and remote epochs to perish from the face of it, having hardly a memory of their existence; even as the nation which built the edifices of Palenque, and those which we admire in the peninsula of Yucatan, was destroyed without its being known what it was nor how it disappeared; *even as the Toltecs perished by the hands of barbarous tribes coming from the north,* no record of them remaining but the pyramids of Cholulu and Teotihuacan; and, finally, even as the ancient Mexicans fell beneath the power of the Spaniards, *the country gaining infinitely by the change of dominion, but its ancient masters being overthrown,* so, likewise, its present inhabitants shall be ruined, and hardly obtain the compassion they have merited, and the Mexican nation of our days shall have applied to it what a celebrated Latin poet said of one of the most famous personages of Roman history, ‘*Stat magni nominis umbra.*’ Nothing more remains than the shadow of a name illustrious in another time. May the Almighty, in whose hands is the fate of nations, and who, by ways hidden from our sight, abases or exalts them according to the designs of His providence, be pleased to grant unto ours the protection by which He has so often designed to preserve it from the dangers to which it has been exposed.”

“Most affecting word of prophecy,” says Mr. Sumner, and so it is—but God has given us the duty to bless them and make them even as brethren, co-heirs with us, if they will accept.”

Conclusion of Mr. Sumner:

“Such are the prophetic voices, differing in character and importance, but all having one augury and opening one vista, illimitable in extent and vastness. Well did Webster say:

'The prophecies and the poets are with us.' And again, with regard to this country, there is no poetry like the poetry of events, and all the prophecies lag behind the fulfilment; but my purpose is not with the fulfilment, except as it stands forth visible to all.

"All these various voices, of different times and lands, mingle and intertwine in representing the great future of our Republic, which from small beginnings has already become great. It was at first only *a grain of mustard seed, which is indeed* the least of all seeds, but when it is grown it is the greatest among herbs and becomes a tree, so that the birds of the air come and lodge in the branches thereof. Better still, it was only *a little leaven*, but it is fast leavening the whole continent."

Here Mr. Sumner gives the strongest evidence of the theory original with me, but especially announced by Jesse H. Jones, and before less distinctly by some of the prophetic voices quoted by Mr. Sumner; and I have frequently used the same simile, viz.: that the work of our Pilgrim fathers is the leaven which has leavened the whole lump, and that this foundation upon Plymouth rock by God's people establishes the kingdom of God; the New World was the mustard seed, and to be used not as a mere simile but as the positive, unqualified fulfilment of the Lord's prophecy—that the kingdom of heaven was like leaven and like a mustard seed.

Charles Sumner concludes thus: "God bless the words, and may He keep our statesmen from ever deviating from that which is the highest and noblest, that which is worthy of the kingdom which Jesus Christ came to set up upon the earth."

"It is easy to see that empire obtained by force is non-republican and offensive to the first principle of our Union, according to which all just government stands only on the consent of the governed. Our country needs no such ally as war. Its destiny is mightier than war. Through peace it will have everything. This is our talisman: give us peace and population will increase beyond all experience; resources of all kinds will multiply infinitely with immortal beauty; the name of Republic will be exalted until every neighbor, yielding to irresistible attraction,

seeks new life in becoming part of the great whole, and the national example will be more puissant than army or navy for the conquest of the world."

CHARLES LATIMER.

THE ALTAR AND PILLAR TO JEHOVAH.

VII.

A curious and highly instructive illustration of the convertibility of a treasury-stronghold into a monumental tomb, and that, too, not always for the king, but sometimes for his treasurer, is this in the 22nd chapter of Isaiah: "Thus saith the Lord Jehovah of hosts, Go get thee unto this treasurer, even unto Shebna, who is over the house, and say, What hast thou here, and whom hast thou here, that thou hast hewed thee out a sepulcher here, as he that heweth him out a sepulcher on high, and that graveth an habitation for himself in a rock? Behold, Jehovah, who covered thee with an excellent covering, and clothed thee gorgeously, shall surely whirl and toss thee like a ball into a large country: there shalt thou die, and there the chariots of thy glory shall be the shame of thy lord's house. And I will drive thee from thy station, and from thy state shall he pull thee down. And it shall come to pass in that day, that I will call my servant Eliakim, the son of Hilkiab: and I will clothe him with thy robe, and strengthen him with thy girdle, and I will commit thy government into his hand; and he shall be a father to the inhabitants of Jerusalem, and to the house of Judah. And the key of the house of David will I lay upon his shoulders; so he shall open, and none shall shut, and he shall shut, and none shall open. And I will fasten him with a nail in a sure place; and he shall be for a glorious throne to his father's house. And they shall rest upon him all the glory of his father's house, the offspring and the issue, all vessels of small quantity, from vessels of cups, even unto all the vessels of flagons. In that day, saith Jehovah of hosts,

shall that which is [now] fastened with the nail in the sure place be removed, and be thrust down a descent; and the burden that was upon it shall be thrust out: for Jehovah hath spoken it."

This address to Shebna, which we have rendered according to the marginal reading and the rule of consistency, naturally divides itself into three parts;—the first part, in which Shebna is compared with some person in a like position and office with himself; the second in which his destiny is the reverse of his expectations, because deservedly the reverse of that of the treasurer with whom he is compared; and the third, in which Eliakim is made treasurer in place of Shebna, apparently for no other reason than because of sufficiently resembling in character the treasurer with whom Shebna is compared to lawfully imitate him in actions. The prophet refrains from mentioning the name and treasury of the person with whom he makes the comparisons, probably because the great treasurer's identity, and his sacred treasures of wisdom and virtue, were not to be revealed until the fullness of times, when they would be ultimated and fulfilled in the Christ, and in his revelation of those mysteries of the Kingdom of Heaven which the Christ assured His disciples it was given them to know.

Perhaps the greatest difficulty in the way of a clear understanding of the above address to Shebna is that the example which he is charged with having unwarrantably imitated is referred to in the present tense; but this difficulty is greatly lessened by the reflection that the example must, in the very nature of things, be regarded as historic. According to Lange's Commentary, the incongruity is explainable by evidence of a poetic construction in the part of the sentence in which it occurs, going to show that it is a quotation from some ancient poem, probably written contemporaneously with the event alluded to. It may be a quotation from the chant of a masonic ritual, accompanying performances commemorative of those of the first master-mason, enacted by the members of a fraternity into which the kings and treasurers of the house of David were initiated by the prophets, who constituted its highest order, "the school of the prophets," and who were the only persons

able to penetrate its deepest and most sacred mysteries. Certainly language implying the occurrence of an example after the imitation of it requires explanation; and if this poetic theory be not the true one, or even if it is, there may be this other explanation of it, namely, that there was a sort of immortality belonging to the example, as to something inspired, like that which makes us refer in the present tense to Isaiah's reference to it in the present, or like that which makes us speak of what John says in the Revelation, or of what David says in the Psalms, notwithstanding the fact that these inspired men wrote so long ago, and have been dead to the external world hundreds and thousands of years.

A still more definite and appropriate example of the preterit in the present is that of the "first martyr" of our race, in "actions that speak louder than words." "By faith Abel offered unto God a more excellent sacrifice than Cain, by which he obtained witness that he was righteous, God testifying of his gifts; and by it, though dead, he yet speaketh." (Heb. xi: 4). In like manner, by faith in the righteousness of the Lamb of God, a later "keeper of sheep" than Abel, the Shepherd Philition, built an altar typical of that on which was to be offered the "Lamb slain from the foundation of the world," near to the altars on which the Cainitish tillers of the ground offered to the gods "the fruits of the earth," their "radishes, onions and garlics"; and, anticipating the conversion of his Great Altar of Sacrifice into the Great Altar of Witness, under cover of its "head and hairs like the pure wool," and of its "garment white as snow" from the head "down to the foot," the prototypal "shepherd of Israel" hewed him out "a sepulcher on high," and graved "a habitation for himself in a rock," to signify the faith by which he obtained witness of the appropriation and the righteousness of the Lamb of God to himself, to clothe his nakedness, in the absence of all righteousness of his own, and to shelter him from the impending retribution of God's righteous law in the day of judgment. And so, too, of that faith and righteousness, even more than of the proportions and commensurabilities of mathematics and astronomy, the Shepherd Philition, though dead long before the time of

Shebna, yet spake to Isaiah, and "yet speaketh" to us, in the masterwork of his hands, demonstrating the eternal truth of the words of Jehovah to the children of Israel, "This is my Name forever, and this is my Memorial unto all generations."

But I did not reach this grand conclusion by so long a stride, and cannot expect my readers to do so. Let us therefore proceed step by step, making sure of the ground on which we tread, till the last step shall have brought us to our destination, the final truth in the matter, whether it accords with my theory of the uses and builder of the Great Pyramid or not. The steps to be taken appear to be these: (1) Shebna's office; (2) his place, to which Isaiah was to go to find him; (3) what he had there; (4) whom he had there; (5) what he had done there; (6) the logical connection between the possessions and the deed; (7) the person with whom Shebna is compared; (8) his sepulcher on high; (9) his habitation in a rock; (10) the sense in which he may have been said to hew out and grave them, as in a solid rock, in a superstructure of individual stones; (11) what he must have had in the one, and who in the other, to justify his making them for himself rather than for his king; (12) significance of the honors conferred on Shebna in the light of his forfeiture of them and their bestowal on another; (13) likeness of Eliakim to somebody as to a type of the Christ; (14) the conclusion.

(1) *Shebna's office.* It was that of treasurer to King Hezekiah at the beginning of his reign; and to be treasurer of the house of David was to be Prime Minister, or what in Turkey is called Grand Vizier. That this is so is easily seen when we reflect that sovereign power lies in the means essential to its exercise, and that whoever in those days was intrusted with the care and management of the royal finances, to increase and expend them in accordance with his own good will and pleasure, was invested with the supreme control, so long as he retained the confidence of his king. This makes the treasury and the kingdom in a manner synonymous with each other; and to be "over the house" was to be over both, though the phrase was sometimes used in relation to the one, and sometimes to

the other. Lange says: "The office seems to have been the highest under the king, as was the case in Egypt, when Pharaoh said to Joseph, 'Thou shalt be over my house; only in the throne will I be greater than thou.' (Gen. xli: 40)." Supposing the primary meaning of "the house" to have been the treasury, Pharaoh's "house" and his "throne," the one under Joseph and the other under himself, represented the actual and the nominal rulership of his kingdom; and so absolute was the delegation of power to Joseph's superior wisdom and goodness that only in name was the king greater than his viceroy.

That by "the house" over which Shebna presided was primarily meant the treasury, and that by inference this is what is meant by "the house" over which Joseph presided, may be seen by comparison with "the house," "secret place" or "tower" in which the business functionary of the Prophet Elisha bestowed the sacrilegious fruits of his covetousness. (2 Kings, v: 124). Another illustration is "the house of Baalberith," which is shown by the circumstances connected with it to have been both a tower and a treasury, constituting a treasury-stronghold. (Judges, ix: 4). But the most positive proof that the primary sense of the phrase "over the house" is over the treasury is the following in Isaiah, concerning the treasury of Hezekiah, which in all probability was the one in which Shebna had hewed himself out a sepulcher, in imitation of a treasurer who had done the like elsewhere. The proof to which I refer is this: "At that time Merodach-Baladan, the son of Baladan, the King of Babylon, sent letters and a present to King Hezekiah, for he had heard that he had been sick, and was recovered. And Hezekiah was glad of them, and showed [the messengers] the house of his precious things, the silver, and the gold, and the spices, and the precious ointment, and all the house of his armor, and all that was found in his treasures; there was nothing in his house, or in all his dominion, that Hezekiah showed them not. Then came Isaiah the Prophet unto King Hezekiah and said unto him: What said these men? and from whence came they unto thee? And Hezekiah said: They are come from a far country unto me, even

from Babylon. Then said he: What have they seen in thine house? And Hezekiah answered: All that is in mine house have they seen: there is nothing among my treasures that I have not showed them. Then said Isaiah to Hezekiah: Hear the word of Jehovah of hosts: Behold, the days come, that all that is in thine house, and that which thy fathers have laid up in store until this day, shall be carried to Babylon: nothing shall be left, saith Jehovah." (Isa. xxxix: 1-6).

After such clear proof that "the house" over which the King's Prime Minister presided was his "treasury," I think I may reasonably quote "the Shepherd, the Stone of Israel," as referring to Joseph and his Great Treasury-Stronghold, and to their defiance of the inundation of the Nile, when he said to his disciples, "Every one that cometh unto me, and heareth my words, and doeth them, I will show you to whom he is like: he is like a man building a house, who digged and went deep, and laid a foundation upon the rock: and when a flood arose, the stream broke against that house, and could not shake it, because it had been founded upon the rock." (Luke vi. 47, 48.) The idea that "that house" was a treasury derives additional support from the fact that it is presented as a figurative illustration of the spiritual teaching immediately preceding it: "The good man, out of the good treasure of his heart, bringeth forth that which is good; and the evil man, out of the evil treasure of his heart, bringeth forth that which is evil: for out of the abundance of the heart his mouth speaketh." A treasury-stronghold, like a mastaba, is also evidently meant by "the house," in the words of our Lord: "But this ye know, that if the master of the house had known in what watch the thief would come, he would have watched, and would not have suffered his house to be digged through." (Mat. xxiv. 43.)

(2.) *Shebna's place.* Now that "the house" is seen to be the treasury, "Go, get thee to this treasurer, even to Shebna, who is over the house," is as specific a direction for finding him as for determining the nature of his office. Lange says, "The thrice repeated '*here*,' intimates that the place was a select one, not standing open to every person." Indeed, the awful question of the man of God, "What hast thou here, and whom

hast thou here, that thou hast hewed thee out a sepulcher here?" more than intimates that even the treasurer himself might have become guilty of profane intrusion, and was in this more responsible to the prophet than to the king. Conversion of the treasury-stronghold into a monumental tomb was something too sacred and solemn to be undertaken for the gratification of any mere selfish or worldly ambition, or for anything less noble and self-sacrificing than the glory of God and the good of mankind. Let us therefore consider what Shebna's answer to these questions must have been.

(3). *What Shebna had there.* The only treasures there, about ten years after this question, were those which King Hezekiah, in the unsuspecting gratitude and generosity of his heart, so foolishly exposed to the deceitful spies of the hypocritical King of Babylon; and of these, though some were consecrated to Jehovah, and though some were for the anointing and embalming of the dead, none belonged to Shebna, but all pertained to the house of David, of which the heir and representative was Hezekiah.

(4). *Whom Shebna had there.* I think he had there a so-called Shebna, a sort of Baal-berith, standing in a niche of the sepulcher which he had there hewed out for himself, near to the sarcophagus in which he intended his body to be laid when it should be anointed and embalmed for the burial, all in accordance with the fashion of deification in the land of Egypt, the country with which Judea was at that time disposed to enter into intimate alliance, both military and religious, against Assyria and Babylon. I am aware of the boast of the Egyptian priests to Herodotus, that the gods of Egypt, unlike those of Greece, had never lived on earth; but, in the light of abundant proof to the contrary of this, it can only be looked upon as an implicit recognition of the superiority of the Divine Trinity of the Hebrews, with whose claim on the hearts and lives of mankind they had good reason to be considerably acquainted. Notwithstanding this, however, the Israelites were forever relapsing into the idolatry of the Egyptians, and there is nothing improbable in the supposition that Shebna was ambitious of such a place among the gods as had been accorded

by the Egyptians to the greatest of their benefactors, the man whom a certain Pharaoh made ruler over his house, and over all the land of Egypt. I allude to the opinion put forth by Professor Bush, not without the support of other learned commentators, that Osiris, Apis, Sirapis or Osirapis, was the Egyptian representation of Joseph, whose symbol in the escutcheon of the twelve tribes of Israel was Taurus, affording to the Egyptians what seemed to them good reasons for his transportation to the constellation of the Pleiades, and for their worship of him on earth, especially in Memphis, the place of his residence, under the form of a sacred bull, born again, with certain distinguishing marks, every twenty-five years. Whether intentionally or not, he was mythologically incarnated in successive periods of as many years as there were inches in his sacred cubit.

Of course, I cannot suppose the deification of Joseph, under the name of Osiris, without supposing that of Asenath, the wife of Joseph, under the name of Isis. Mr. Latimer thinks that the originals of Osiris and Isis were Adam and Eve. If God put Joseph where he put Adam (and that he did I hope to show under the head of "The Midst of the Land of Egypt"), we may believe that he inspired him not only with the design and execution of the "altar and pillar to Jehovah," in memory of the "trees of Life and Knowledge in the midst of the garden," but with the idea of naming his wife in memory of Eve, whom Adam "called Isha, because she was taken out of Ish." It is easy to imagine the conversion of Isha into Isis, when we remember that the temple and principal worship of Isis was at Sais, in the Nile delta. Some writers speak of Isis as identical with Neith, and of the inscription over the door of her temple and on the pedestal of her statue, "I am one and all things, all that has been and all that will be, and no mortal has hitherto taken off my veil," as being the inscription on the temple and pedestal of Neith, representing Dame Nature. Neith was not only chiefly worshiped at Sais, but was the "mother of the sun-god," *i. e.*, of Horus, son of Isis. But what have these two names and their associations to do with "Asenath, the daughter of Poti-

pherah, Priest of the City of the Sun"? Their combination gives us Isha-Neith, the first of which I take to be a prefix bestowed by Joseph in memory of "the mother of all living," and the last of which is most likely to have been the name bestowed on her by her parents. Seeing how easily in ancient times one vowel was substituted for another, and how often it was found expedient to omit a cumbersome *h*, the steps by which Isha-Neith became converted into Asenath can be easily traced. I even think that the name Osiris may be similarly accounted for. Joseph, as rendered by the Saracenic element of the language of Isa-bellea, is "José," and in the pronunciation all that is left of it is "Osé." I therefore think that "Ūs" was deemed to be, as it really was and is, all that was essential of the name Joseph; and my next thought is that "Iris" was Isis converted into a suffix, signifying in Egypt, as afterward in Greece, a prismatic halo, an iridescent chromosphere, a concatenation of glorious circles mathematically derived from the radiant lines and angles of "the terrible crystal." As to the children of Isis and Osiris, they were just three, the number born to Asenath and Joseph; and of the three, Horus, the youngest and the only one really worshipped, is likely to have been the ancestor of the Copts, the "issue" born to Joseph after Ephraim and Manasseh. According to this, the "king who knew not Joseph" was the king who so thoroughly misunderstood him as to deify him, reopening the idolatrous temples for the sake of adding him to the Egyptian pantheon, at the same time demonizing and enslaving his brethren under the name and form of the monster Typhon, with a serpent-entwined body and a hundred snaky fingers, because of the mingled malignity and avarice which prompted them to meditate his death and sell him into slavery. The 10 x 10 digits of the guilty brotherhood, who "hated him because of his dreams," were the 100 of the brother of Osiris.

Everything said about Osiris favors the idea that he was a deified representation of Joseph. Murray's 'Manual of Mythology' says: "The worship of Osiris was universal throughout Egypt, where he was gratefully regarded as the great example of self-sacrifice, as the manifester of good, as the opener

of truth, and as being full of goodness and truth." It reminds us of "Zaphnath-paaneah;" and who better fitted to be the builder of the Great Pyramid, in the estimation of those who claim it for their inheritance? His sleep of death in the heart of a mountain, awaiting his resurrection and victory over Typhon, is analagous to my idea of Joseph's sleep of death in the granite sarcophagus in the king's chamber. The story that "his dead body was fitted into a chest, thrown into the Nile, and swept out to sea," is connected with the search for him by Isis throughout the world, and may refer to the abstraction of his bones from the "coffin in Egypt" by Moses, whose ark of bulrushes was committed to the Nile, and who was "called Moses because he was drawn out of the water." At all events, there appears to be no authentic evidence of Isis and Osiris in the Egyptian mythology until after the death of Joseph. They are said to be "deities of the second cycle." On no other supposition than that they were the deified ancestors of Ephraim and Manasseh, and had been so for over a hundred years, can we reasonably account for the molten and graven image of the young Apis made by Aaron at the foot of Mount Sinai, in compliance with the demand of the children of Israel: "Up, make us gods, which shall go before us; for as for this Moses, the man that brought us up out of the land of Egypt, we wot not what has become of him." And on no other principle can we rationally explain the declaration: "These be thy gods, O Israel, which brought thee up out of the land of Egypt." (Ex. xxxii, 4). The Israelites could not have been so foolish as to credit the gods of Egypt with having brought them up out of Egypt, and Aaron could not have been so absurd as to build an altar of sacrifice to Jehovah before the golden calf, proclaiming before it, "To-morrow is a feast to Jehovah," if they had not recognized in that molten and graven image of the Egyptian Apis a representation of deified personages more nearly related and friendly to the Israelites than to the Egyptians, and more closely allied to "the Jehovah Gods of Israel" than to Neph, Amun, Pthah, Khem, Sati, Maut, Baubastis, or any of the other original and more distinctively Egyptian deities, of whom each and all would naturally be partial to the Egyptians

rather than to the Israelites. If Joseph was the builder of the "memorial" on which the name of "Jehovah Elohim" was inscribed, and if his bones, which the children of Israel had with them, were taken therefrom, it is not so very strange that they easily associated him with the Jehovah Gods of Abraham, of Isaac, and of Jacob, and were ready to accept him as their leader, under the visible form of "the firstling of his bullock," until the reappearance of Moses, with the tables of the law, to correct their mistake. Jehovah wished them to "honor," not to worship, their "father and mother," and therefore prohibited the substitution of "graven images, the work of men's hands," for the "image and likeness" of the Divine Love and Wisdom, the work of the Holy Spirit. The image of Shebna in the sepulcher which he had hewed out for himself in the treasury over which he presided, if he had one there, was offensive to Jehovah, because false to nature, as were all the images of that day, thus being liable to become an object of idolatry, instead of being a medium of access to the features and character of the human original.

J. W. REDFIELD.

METROLOGY.

Metrology is the science of weight and measure. In view of the discord that prevails in the numerous systems of weight and measure now in use, it can hardly be said that they are worthy of classification with the sciences. In philosophy, chemistry and astronomy, natural law is the foundation. Could the "weights and measures" of the world be put upon a similar basis they would be entitled to a respectable place in the catalogue of sciences, and great advantage would accrue from a corresponding readjustment of the now discordant metrologies.

In the discussion of this subject we lay down the following principles as essential to a perfect system of metrology:

First. The prime unit, or standard of the system, must be a determinable quantity.

Second. This standard must have a simple, and definite relation to the physical world; it must be cosmic.

Third. The several orders or branches of the system and their numerical subdivisions must be in simple and definite relation to one another.

Fourth. Fractional relations must be avoided as far as possible between two consecutive subdivisions.

Fifth. The subdivisions must be of practical convenience. Of several systems that equally combine these elementary principles, that is to be preferred which involves the least disturbance of existing metrological use.

Under the first rule, that the prime unit or standard be a determinable quantity, it is evident that this unit should not be the lowest of the subdivisions, because a small error in practically obtaining it would be greatly multiplied in the higher subdivisions. A pound rather than a grain should be taken as the unit of weight, and a foot or a yard rather than an inch as the prime unit of measure.

Under the second rule we meet a practical difficulty. To

derive a prime unit or standard from the physical world requires a close observation of many facts. Take as an illustration the British standard gallon, liquid measure. It is 231 cubic inches of distilled water at its maximum density 39.83° Fahrenheit, the barometer being at 30 inches. This quantity of water is defined as weighing 58,373 Troy grains. In this definition of a standard gallon we have four distinct orders or branches of metrology; linear measure, heat measure, atmospheric density, and gravity or weight. But even this is not complete, for gravity varies with a change of latitude and of level above or below sea level. A complete definition therefore involves the use of circular measure to indicate the latitude. From this it will be seen that the different denominations and orders of a system of metrology are necessarily co-related.

The importance of an exact and fixed prime unit or standard by which the secondary units of the system are defined and all its branches are united in mathematical relation is too manifest to need enforcing. The only question open to consideration under the second rule is what the prime standard of the system shall be, a weight unit, a heat unit, a capacity unit, a linear unit or a time unit. If the prime unit be established we may proceed to build upon it a system of metrology embracing denominations of whatever kind may be deemed needful.

What then shall be the prime unit? Evidently one that can be obtained with the least possibility of error. Regard being had to the accuracy of measurement, and the physical world as the source from which to derive this unit, it appears that it should be a straight line derived from a measure of time or the circular motion of the earth.

The prime unit of the French metrology is the metre. It is an approximate computation of one ten-millionth of a meridional quadrant of the earth, based upon the actual survey of meridional arcs. The exceeding difficulty attending such a survey, the unknown form of the earth, and the manifest differences in the curvature of the arcs even in the same latitude, cast a grave doubt upon the result. Similar difficulties would attend the effort to establish a prime unit on the basis of a longitudinal measurement of the earth. Laying aside, then, all geo-

detic processes as an uncertain basis of metrology, let us see what a time unit may produce.

It will be admitted that nothing can be more accurately measured than time. The mechanical instrument for its measurement is the pendulum. A pendulum that makes 86,400 vibrations in one mean solar day is called a seconds pendulum. Its length depends upon its geographical position: the nearer the equator or the higher above sea level, the shorter it must be. It has been found by experiment that a seconds pendulum at London is 39.13929 inches. A loss of one vibration in twenty-four hours indicates an increase of one one-thousandth of an inch in its length. The loss of one vibration in forty-eight hours indicates an increase of one twenty-five hundredth of an inch. This is sufficient to show how great accuracy can be obtained by using the pendulum, in connection with the diurnal revolution of the earth, to determine the prime unit or standard of measure.

It may be objected to this method that there is great difficulty in taking the measure of a mean solar day, the difference in two consecutive days exceeding sometimes twenty seconds. But this difficulty is overcome if the pendulum observations be made with reference to a sidereal day. Having found the number of vibrations in a sidereal day it is simply a matter of mathematical computation to determine what must be the length of a pendulum making 86,400 vibrations in a mean solar day at the place of observations. The only point left for consideration is, where shall that place be, at London, Paris, or Washington? Shall it be at sea level or some point inland? The place is of less importance in a system of metrology than the length of the pendulum.

If we resort to a seconds pendulum for a prime unit, the standard of our metrological system will be closely related to the specific gravity of the earth, and especially to the subdivision of the circle into degrees, minutes, and seconds. Evidently the subdivision of time and circular measure should be without fractions. This is the case in our present system; 86,400 seconds of time correspond exactly to 1,296,000 seconds of the circle. Whatever changes may have taken place

in other branches of ancient metrology, these divisions of time and the circle have remained intact. We shall not undertake to change them or depart from them.

Taking then 86,400 pendulum vibrations as the standard measure of a mean solar day, the length of such a pendulum will depend upon its geographical position. By experiment it has been found to be 39.13929 inches at London, and by computation 39.0152 at the equator. Whatever be the length, from which to derive the prime unit, it must be between 39 and $39\frac{1}{4}$ inches, at any conveniently accessible point for observations. From a critical review of pendulum vibrations, observed in different latitudes between London and the equator, it appears that the length of a seconds pendulum at Gizeh, in Egypt, at the level of the king's chamber, is 39.0625 inches. The mathematical formula for the value of gravity on which the vibrations depend is $g = \pi^2 l$, g representing gravity in feet and l the length of the seconds pendulum in feet. The equation may be put in the following form: $\sqrt{g} = \pi\sqrt{l}$. Hence at Gizeh $\sqrt{g} = \pi\sqrt{\frac{39.0625}{12}} = 5.66812$. In this formula g is apparent gravity; something must be added to express true gravity or mean density of the earth, on account of the centrifugal tendency of the motion of the earth to diminish the real weight of bodies as they approach the equator. The value, 5.66812, we have obtained for the square root of apparent gravity in latitude $29^\circ 58' 51''$ thus corrected is nearly 5.69. In the Royal Society proceedings for 1878 Mr. Joule obtained, from new experiments, a modification of Bailey's result, and brought 5.69 for mean density of the earth. (Since the above was written, a reply from Colonel Herschel, in answer to enquiries put to him by Professor Smyth in regard to the value of gravity at the Great Pyramid, says that a five seconds pendulum there is 976.65 inches long, and a stone in five seconds falls 401.625 feet. According to this the length of a seconds pendulum would be $401.625 \div 5^2 \times 2\pi^2 \div 12 = 39.06539$. Colonel Herschel's computation may be based upon the mean meridional curvature of the earth at sea level; if so, a seconds pendulum in the kings chamber, vibrating in the air, must be $39.06539 - .0025 = 39.06289$. The slight difference of .00039 between this and

39.0625 might be quite eliminated by local causes, or if Colonel Herschel should base his computations on the meridional curvature of longitude E. 31°).

The advantage of this pendulum length, 39.0625, in relation to Anglo-Saxon metrology is evident from the fact that, if it be divided into 625 equal parts, each part is exactly $\frac{1}{16}$ inch. The inch and foot rules are thus obtained in pendulum units clear of fractions. It may be well to notice here the coincidence of the number of subdivisions of this seconds pendulum 625 and the number of pounds averdupois in ten cubic feet of rain water, 625. If we were to construct a scientific system of metrology that would be nearly or quite identical with Anglo-Saxon weights and measures, we might take the seconds pendulum at Gizeh as our prime standard. The British Government sixty years ago recognized the value of a pendulum standard in declaring the number of inches in a seconds pendulum vibrating in a vacuum at sea level in the latitude of London to be 39.13929 inches. Not only is the practical part of this definition as a reference standard inconvenient, but it requires a very nice determination of the two parts of measurement, viz: the centre of oscillation and the centre of gravity of the pendulum, which may have led the British government, in 1855, to omit the pendulum clause from the act fixing a standard. Could we dispense with the necessity of finding these centres and still reach a definite result, the chief objections to a pendulum standard would disappear.

On examining the Gizeh pendulum of 39.0625 inches we find that if a shorter length be used so that the vibrations are 100 instead of 60 per minute, the difference in the length of the two pendulums is exactly 25 inches. The formula for the computation is $100^2:60^2::39.0625:14.0625$. This differential of 25 inches may be taken as a prime unit, or standard of measure, and this method of determining the standard might be called the differential-pendulum method. The period of a sidereal day may be determined by direct observation within $\frac{1}{10}$ of a second of time. Admitting this limit of error, our differential of 25 inches would be $25 \pm .000008$, which is less than half the error arising from computations based on transit obser-

vations ten degrees apart on the same parallel of latitude, leaving out the possibility of errors in surveying the distance between the two points of observation. The apparatus for practically determining the measure of our differential is not complicated. First, a simple pendulum vibrating seconds at Gizeh. Another pendulum of such weight of disc and extreme lightness of rod that in shortning the rod twenty-five inches there will be no appreciable change of the centre of gravity. Let this be adjusted to synchronize with the seconds pendulum. Then lift it through its bearings till the vibrations are 100 instead of 60 per minute, every fifth vibration of the shorter synchronizing with every third vibration of the longer pendulum. The distance it is thus lifted will be 25 inches by observation, with a possible error of $\pm .0001$ inch, or 1 250,000th part of the entire 25 inches. If the observations be continued through twenty-four hours, planetary or cosmic influences which might affect the number of vibrations, will be neutralized. Transfer these pendulums to London and the seconds pendulum of Gizeh will make 60.059 vibrations a minute, and the shorter one, making 100.059 a minute, will indicate a differential of 24.99 instead of 25 inches. At the equator, the differential corresponding to a difference of 40 vibrations per minute will be 25.007 inches. It appears therefore that if a Gizeh differential-pendulum measure, 25 inches as here given, were adopted as a prime standard of linear measure, with a small correction of 1-1000th of an inch for a difference of 3° of latitude, we would have an international standard convenient for reference in any part of the civilized world, and in accord with the first and second rules laid down at the beginning of this essay.

We come now to consider the third rule, viz: The several orders or branches of the system and their numerical subdivisions must be in simple and definite relation to one another. This rule finds an illustration in the correlation of time and circular measures, 1 second of time equals 15 seconds of the circle. The test is severe when brought to bear upon every branch in a system of metrology; and it might result in casting out certain special kinds of measures as useless and cumbersome. We have accepted 1,296,000" as the numerical base

of circular measure, and 86,400 seconds as the numerical base of time measure. To these we may add the Gizeh differential-pendulum standard, subdivided into 625 equal parts, of which 16 make exactly 1 British inch. Our object now is to establish a simple and definite relation between 1,296,000, the base of circular measure, and other branches of the system. The means which we shall use to this end is the inch, or 1.25th of our pendulum differential. A circle having a circumference of $\frac{1296000}{10}$ inches has a diameter of 41252.95. The half side of the inscribed square is 14585.121, and the half of this is $7292.56 = (9.00105) \times 10^5$. Let 7292.56 represent the number of units, or, say grains, in 1 pint of water. On this basis we may construct a table of fluid measure that will bear a simple and definite relation to the base of circular measure, and the specific gravity of the earth, and yet differ from present Anglo-Saxon use by only 1.5 grains in a pint.

TABLE OF FLUID MEASURES.

6 drops	= 1 gravit	=	5.6973	grains.....	U. S. Dispensatory.
10 gravits	= 1 drachm	=	56.973	"	56.9618
8 drachms	= 1 ounce	=	455.785	"	455.6944
4 ounces	= 1 gill	=	1823.140	"	1822.7776
4 gills	= 1 pint	=	7292.560	"	7291.1104
2 pints	= 1 quart	=	14585.121	"	14582.2208
4 quarts	= 1 gallon	=	58340.484	"	58328.8832

The remarkably close agreement of our table with that given in the United States Dispensatory for the same measures will be observed. Notice may also be made of what we term gravit measure, one-tenth of a drachm, 5.6973 which is very nearly, if not exactly the numerical expression of the specific gravity of the earth.

One of the most important divisions of Anglo Saxon metrology in present use is the bushel with its subdivisions. The volume of the Winchester bushel, United States standard, is 2150.3955 cubic inches = 1.244 cubic feet, and contains 77.627413 pounds distilled water at maximum density. A cubic foot of rain-water weighs 62.5 avoirdupois pounds (Haswell), and 1.2444 cubic feet weigh 77.7775 pounds, which is very nearly equal to 5.65812, apparent gravity in the king's

chamber multiplied by 100000 and divided by 7292.56, the number of grains in 1 pint of water, or the ancient equivalent of 1 pound. The authorities I have for the weight of a cubic foot of distilled water do not agree: a mean would make the coincidence much closer between the pound weight of 2150,3955 cubic inches of rain-water and the pint pounds found by the formula $\frac{5.66812}{7292.56} \times 100,000 = 77.7248$. It is therefore worthy of remark that a change of about ten grains in our standard bushel would make it correlate perfectly with the apparent value of gravity in lat. $29^{\circ} 58' 51''$. Could the pint of water and pound of avoirdupois be identical, it might be of great advantage as well as of practical convenience in metrological use.

The relations of square measure, cubic measure and linear measure, the inch unit in Anglo Saxon metrology, are well understood. It is to be hoped that the historical and monumental evidences of the antiquity of our system of weights will be thoroughly investigated before we consent to allow it to be superceded by any other.

H. G. Wood.

CHEOPS AND JEZEEH.

Cheops is an Egyptian word with a Greek orthography. The orthography is not only Greek, but the conception which it describes is a degeneracy, indicating a mode of thought which could not comprehend the true idea as built into the Great Pyramid. The Greeks never could comprehend true philosophy. Besides, even the Egyptians, in the age of Herodotus, and even in the days of Isaiah, had become so degenerated from the archaic philosophy of their fathers that they could not comprehend the truth as taught by the original princes of Noph-Nouff, or Knoph. (Isaiah, chap. xix).

The *ch* is a Greek and Aeolic compound glyph, and, even in English, always describes that which rules in discrimination. The *ops* is Latin, and original Egyptian. It describes the essential in position. *That which is in fixed discrimination of the essential* is a very good definition of Cheops. But I do not think it exactly describes the truth or the original conception.

I take the original word to be Kiops. The *k* is archaic, and Accadian in every sense; and it represents that prime element in language which describes holding in containment, and carrying in the holding, and, with the vowel *i*, the symbol of likeness and similitude, we have this description: that which, in its own being, holds and carries, in similitude, the first or prime essential in manifestation and exposition. In this sense the Pyramid carries, in self-exposition, Jehovah's essential philosophy of numbers and structure, even to its moral and spiritual archetype. The Pyramid theorem is the essence of geometry, as it is built into cosmos "in measure, in numbers and in weight;" and it is a truth which should be kept in mind, that morals obtain their standard in the conception of right; right lines or measure, "exact" numbers, finite and intelligible, and just weights—that which is balanced and equal. This is the prime truth in structural cosmos. It is the prime truth in all moral

apprehensions, and hence the fact, an "irrational" geometry, and an "incommensurable" standard of "right," "exact" and "just," must be the breeder of all kinds of infidelity to the truth.

This Kiops conception, as exemplified in structure, carries itself even to the spiritual thought. Right, exact and just in mathematics develop into right, exact and just in morals, and in this the mind is carried to the archetype in the spirit of the meaning and design; and to the Divine Spirit, which is the fullness or the fulfilling of the entire conception in exemplification. In this sense this Pyramid is God manifest, not in the flesh, but in material exposition in stone, exemplifying or imaging the essential perfection of structural cosmos, and moral cosmos, and spiritual cosmos, as Jehovah has created them, in numbers, in measures and in weight, according to intelligent design.

God, in all his wonderful works, is always correlating himself, and even into man's intellectual being this truth is so fixed that we all feel that we are seeking truth. "But what is truth?" All truth leads to God. The mere scientist is an infidel, because his highest standard of truth, in the only perfect science, is a fraud and he knows it. His mind is permeated with "irrationals" and "unknown", and his science is without a philosophy to make it the true, exact and just exposition, exemplification and reflection of structural being; and hence, by sequence, he has no divine standard of moral or spiritual being. "God is not in all his thoughts."

Kiops is the imperial or king truth in exposition and symbolization in this Pyramid; and in this fact it is easy to understand how degenerate ages would, by personification, convert the one into a personal king and the other into his tomb. Kiops is indeed buried in this tomb, but not as a personal being or a dead ruler, but as the sum of that philosophy which constituted the religion and science and learning of those archaic ages when man "walked with God." The Kiops Pyramid is the Accadian bible; and to the test of its truth must yet come modern geometry; and when it is comprehended, mathematics will have a philosophy in numbers and structures,

religion an expounder in physics, and prophecy an interpreter which will bring order out of confusion and put sense into modern empiricism.

The true Pyramid is the pure, exact model of cosmic structure, and it carries in its theorem the similitude of all cosmic metrology, and the divine philosophy of numbers and structure, as Jehovah has built them into creation, and into the ten digits, which contain all possible metronic laws within the ability of intelligence to comprehend. In metrology, what the digits cannot describe man cannot comprehend, cannot even think; and before we get to their limits they will be found to contain a fineness of expression and a magnitude of comprehension now not even suspected. The arithmetical laws of addition, subtraction, multiplication and division, do not hold the key to Jehovah's philosophy, nor will they ever, of themselves, unlock this Pyramid. Jehovah is the author of geometry Cosmos is adjusted, measured, numbered and weighed in exact proportions, and equated in a just and all-inclusive ratio. This is geometry, and hence, so soon as the philosophy of geometry—by which every geometrical proportion of necessity is exact—is discovered, the true grandeur of the Kiop's Pyramid will be recognized as the self-demonstrating theorem, carrying in exposition and similitude Jehovah's philosophy of structural cosmos in totality and in microcosmic detail. This is conspicuously noted in the fact that geometry controls even motion, sound, light, electricity and magnetism, and gives to chemistry its combinations and results, and hence makes it a true science.

Gizeh is a modern orthography, and its meaning seems to have degenerated to a name of a place only. It describes that which *rules in its order or grade*. But all Accadian names are "*totems*," and hence describe generic ideas which were noted by the "*cartouches*" or ovals which inclosed them in ancient hieratic language. I regard this word as entirely inadequate to express any idea, prime in pyramidistry. It simply compares one pyramid with the others, or one place or locality with others.

I take the true orthography to be *Yeegah*; *g* is a hardening of *j*, and *j* is a compound of *ye*, *yo*, etc.; *z* is also a compound, and hence they have no prime meaning; *a* short, with *h*, meas-

ures adjustment, exact, *e* means being, and *ee* being *in existence*; and *y* is the fine separate vowel which measures extreme perimeter and fineness, even to spirituality; it describes the finest tone known in the octave. *Yeesah* describes *that which, by virtue of its essential being, rules in exact and balanced adjustment*, and hence, per sequence, is the fullness and ultimate of all design, *per se*. When the word *Yeesah* began to be used as the name of the place or locality of the Kiop's Pyramid, we know not. But originally the words were evidently used to describe generic, prime truth; after ages misused them, as the Spanish in America used sacred names and words. This is usual when ignorance is associated with deep religious convictions. It is seen even amongst our Pilgrim ancestors. But in the use of these words, *Kiop* and *Yeesah*, the one to describe a king principle and the other to localize it, there may be something more than ignorant devotion. There is a propriety in localizing the king truth in the place or the person who is, in its own or his own being, the personification of all authority, truth and justice, and hence who is the fullness and ultimate of all cosmical design. The words, in their essential meanings, belong together, and are as true to themselves and to each other, as the words Christ Jesus or Jesus Christ are in Christianity. The word Christ describes that which primarily and entirely—from the beginning to the end—holds in discrimination and exemplification the essential image or truth; and Jesus, in the character described in the Scriptures, is an exact synonym for *Yeesah*. Should the analogy in the words lead to fixing a connection in philosophy and religion between our age and that which is marked by the Kiop's Pyramid, we need not be surprised. In fact this connection is a necessity. The Hebrew Scriptures are full of Pyramid metric expressions and references as the standards of all their measures and the measures of all the prophecies, and their Scriptures speak of Christ as the anointed measure of Truth; and in Jesus we have personified "the fullness of time," *i. e.*, the equation of the time, and the fulfillment of the Law and the Prophets. He claims a rulership in righteousness, and authority to the uttermost boundaries of Jehovah's design. Who-

ever will study the meaning of these words and the character of the Pyramid and Christ Jesus, will soon be convinced that there is more than a coincidence in the analogy.

In my investigations into the philosophy of numbers and structure, independent of Egyptian pyramidistry, and independent of Christianity, I have discovered one fact which most wonderfully illustrates the unity of the philosophy of the Pyramid and the Christian philosophy, as exemplified in Christ Jesus.

The Christian cross, or the *crux Christiana*, as a symbol of religion and philosophy, has a history extending back into and behind the mystic ages of antiquity, long before the Christian era. This symbol has been discerned among the antiquities of all ethnic peoples. It has been found even among the American Indians, and, with archæologists and ethnologists, and even mystics; it is the mystery of mysteries. Outside of Christ and the scenes on Calvary, none can give it a meaning; and yet all involuntarily bow to its sacred mystery. It is the acme of all symbolizations. The *crux Ansata*, the *crux labarum* and the *crux Christiana*! Who can interpret them? Yet all are geometrical, prime and essential in quadrature; and they represent the learning, the philosophy, the wisdom and the religion which existed among men previous to "the confusion" and "dispersion," and, hence, long before the age when a revelation became necessary. "The Pyramid religion" may yet become the synonym of all truth.

My idea of the Pyramid was drawn in 1877. Every line is controlled by the philosophy of geometrical proportions, which is the new law, I have discovered, and the true Pyramid key, and every proportion will stand the most exact test of the philosophy of numbers and structure, and that, too, by the double means proportional, which I have discovered. In this Pyramid the *crux Christiana* is the exact measure of perfection, and this fact stands out so conspicuously that one cannot but note it. It holds the fullness of time in its arms, and in this it equates substantive form into the perfection of being by fixing the slope of the sides, as well as all other proportions, in exact exposition of the ultimate, in all design in structure. Hence,

I hold that no man can quadrature the circle, or time, except by the Pyramid diagram, in such a way as to show a self-demonstrating theorem. The cross is the supreme symbol of the perfection of Jehovah's philosophy of numbers and structure as surely as it is the supreme symbol of the Christian religion. Yeesah and Jesus identify each other in this symbol, and the day is not far distant when science will become as firm a believer in the cross as the Christian.

J. K. HORNISH.

COLONEL CHESTER'S REPORT AND ADDRESS.*

Colonel Chester, chairman of the committee appointed to address to the President of the United States an open letter protesting against the appointment as American representatives to the International Congress about to consider the location of a prime meridian, exclusively those who were publicly committed to the adoption of the French metric system of weights and measures, reported:

That the committee had fully performed its duties, and that in reply to the letter sent as directed had been officially informed by the State Department that the whole subject matter had been referred to Professor Barnard, chairman of the American delegation, who had been requested to receive and consider any other documents the committee might desire to submit. In view of the fact that there then existed a strong probability that this congress, officially constituted to consider only the adoption of a prime meridian and such questions thereabout and around as might affect such choice, would endeavor at least to obtain some official recognition leading to the ultimate adoption by England and America of the French metric system, therefore all scientific societies interested directly or indirectly in weights and measurements had been requested to send delegates to meet with us and discuss the position. Hence this meeting.

*This paper was adopted in view of an anticipated emergency, a note of warning that subsequent action at Washington fully justified.—C.

Colonel Chester then proceeded to say: It is the more probable that sooner or later the subject of measurement will be discussed before this congress for the following reasons: In addition to the fact that European representatives have openly expressed their strong desire and even determination to make the adoption of the French metric system universal, the question of measurement has a close relationship to the uses of a meridian, and the consideration of the former may affect the choice of the latter. The choice of a meridian by this convention means simply an authoritative declaration of some location, monument, or geographical point selected, from which all nations will agree to measure. It would seem, then, of paramount importance to first determine upon a uniform system or mode of applying measurements to whatever base may be selected, even if different nations employ different units to the measurements of subdivisions. Therefore the suggested, if not officially adopted, plan of conducting measurements from any base may affect the question as to where the zero of such measurements shall be located. But the consideration of this suggestion leads us to recognize closer relations between geodetic divisions and systems of measurement.

It is now universally admitted that all forms of force have exact correlations, and that every action has an equivalent in value, condition and energy in some other mode of action. Motion, electricity, heat, magnetism, gravity, cohesion, are but different "modes of action." But even the cultivated and instructed mind with difficulty conceives of heat and electricity, for instance, as mere actions, verbs, and not nouns substantive, things, fluids or essences, permeating matter. This arises in great measure from a faulty mode of describing actions, a vicious nomenclature built upon the erroneous conceptions of the past, and to which we have accustomed ourselves. And, more than all, because we are accustomed to measure the value and effects of separate actions, having recognized and acknowledged correlations, by separate systems of arbitrary units having no relation whatever to each other. For instance, we speak of "currents" of electricity passing through certain conductors, as water through a pipe, and we indicate the value, condition

and energy of electric action by the meaningless units "volts," "ampere," etc., while a corresponding correlative motive force is indicating in other units, weight, distance, velocity of matter affected.

Now, no action in the mere abstract can be appreciated or conceived of, and we can only indicate exactly by describing the extent, manner and energy with which visible matter is affected by such action. Thus we describe motive force by indicating:

1st. Weight, or amount of matter moved, or amount of action.

2d. Distance moved, extent of action.

3d. How rapidly moved, energy of action.

These terms or units of measurements are, therefore, employed to exactly describe a motion, and these are not applied to the action but to the material matter acted upon. The difficulty arising in comparing an electric action, for instance, with a correlative motive action arises in part from the unfortunate attempt to describe the former action by units applied to the measurement of the action itself, or to an abstraction, and not to the measurement and description of the matter acted upon. As all actions have their exact correlations in amount, extent or condition and energy in all other actions, and as each action can only be appreciated and certainly estimated and measured by analysis of the matter acted upon, it is reasonable, logical and expedient that in each case the matter affected, as to its amount, conditions and energy indicated, should be measured by similar units and described in similar terms. We may logically, or conveniently, in describing one action, measure the matter affected by pounds, inches and time seconds, and in another by volts, farads, amperes, ohms, or by metres and grammes in a third, and in view of the fact that a correlative system of indicating active forces is becoming a world necessity, and the units employed therein must be those employed in measuring matter for all purposes, and must become universal and uniform.

Now the necessity of an international congress to discuss the question of a prime meridian has grown out of the varying practices of mariners in estimating geodetic positions and navi-

gating thereby. As a matter of fact, the prime zero from which each mariner calculates his position is the accidental though known and noted-nooning of his particular chronometer. This calculation he corrects, of course, by adding or subtracting the difference existing between the noon of his chronometer and that of the meridian upon which his charts are constructed. This will be almost certainly fractional. But the errors merely possible because of this unavoidable complication of computations become almost probable when we take into consideration these two facts: First—A senseless tradition has established the error-provoking practice of measuring and indicating longitude from both sides of the assumed zero, as if the world oscillated from side to side instead of revolving continuously in one direction. Secondly—The solar or time circle is divided and measured by units which have no relation whatever to those which measure and divide the equatorial and all other circles.

Time measurement is but a measurement of the velocity of the earth's revolution, and for that purpose we have divided the earth's circumference into twenty-four parts, or hours, which are again divided and subdivided by sixties. While many mathematical and historical arguments favor the belief that for all purposes the circle should be primarily divided by twenty-four, it is perhaps to be regretted that the hour had not been decimally divided, rather than into minutes and seconds. But so firmly and universally engrafted in the human mind, by tradition and custom, is this natural(?) division of the circle for time purposes, that the most radical would hardly venture to suggest any present modification. But for all other purposes of measurement the equatorial and all other circles have been, by Babylonish tradition, divided into three hundred and sixty parts, and again divided and subdivided by sixties—a division unreasonable, and, in the present condition of science, vicious, because in navigation and astronomical science the computations are to a greater or less degree based upon comparative simultaneous measurements of arcs of the solar circle (divided by twenty-four), and of other circles (divided by thirty-six).

Now, to the architect, mechanical engineer or designer of mall or great constructions of any kind, so far as his immedi-

ate avocation is concerned, it may be a matter of small moment whether the rules of his workmen are divided by centimetres or inches and parts, but certainly, in preparing his drawings, he would not employ such scale of equal parts as had a broken fractional relation, or no relation at all, to the divisions upon the rules of his workmen. As unreasonable is it to construct our charts upon a scale based upon the division of a circle into three hundred and sixty parts, when, for the reasons assigned, we are forced to apply to its analysis a scale based upon a division of the circle into twenty-four parts.

Since because of accepted tradition and universal custom we must accept the present division of the solar circle into twenty-four parts, why is it not reasonable and expedient to divide the circle similarly for all other purposes? In fact such expediency is significantly recognized by our own Government in that it has recently established a series of "hour" meridians to facilitate railroad management. But, as the earth revolves continuously in one direction, time is continuously, progressively, estimated from zero to zero. True, the dials of our time-pieces are graduated in twelve parts only, and in counting the twenty-four hours we annex different signs to distinguish the first from the second series of twelve hours. But they are still reckoned progressively, 12 of A. M. being reached, beginning with unit of P. M. For astronomical purposes the twenty-four hours have long been reckoned consecutively, and there is little doubt that this method of counting time will be popularized in the near future. But for the purpose of navigation, we have not only unnecessarily divided the geodetic circle into two semicircles, but in reckoning their divisions, after reaching the maximum, one hundred and eighty, in direct progression, we enumerate in reverse from 180, 179, 178, until reaching the original zero, requiring signs to be attached to distinguish those of the one semicircle from the other; and to these two semicircles, graduated from a common starting point in opposite directions to one hundred and eighty parts, we must apply a circle graduated continuously in one direction in twenty-four parts.

It would appear, then, that if a rational and convenient system of applying measurements to the circle be internationally

determined upon, the selection of the base line from which such measurements are to originate should be determined by more logical considerations than sentiment and national pride. England may insist that the world commences to revolve from her little isle. France may object to the Greenwich meridian from no more logical standpoint, and either or both may plead the danger and inconvenience arising from the necessity of discarding all their present charts. But this plea has no force, since it is evident that no modification of charts would be required beyond the substitution of other figures than those which now distinguish the lines crossing the charts from north to south. But in view of the fact that there is every reason to believe that the adoption of the Greenwich meridian will be violently opposed, for no better reasons perhaps than those just stated, it would be timely perhaps for scientists who will watch the action of this congress to urge our own representatives to propose the adoption of a neutral line, to be selected not because of national tradition and prejudice, but because of its rational and scientific fitness.

A line, to be the base of future measurements for all ages, should at least be one that may in future ages be readily identified. It should therefore be marked, or be susceptible of being marked, by a continuous line of indestructible monuments, a condition only to be realized by the greatest length of land lines, or points readily accessible, and permitting instrumental examination. Is not the line passing through the Great Pyramid one possessing such requirements?

S. M. CHESTER.

THE LATE ROBERT MENZIES.

We extract from November number, vol. iv., 1874, an obituary notice of Robert Menzies, written by his friend and correspondent, Charles Casey :

“ NOT DEAD, BUT SLEEPETH.”

“ Now on the eve of the time of tribulation—when men’s hearts fail them for fear, and for looking for those things that are coming on the earth—it seems as if the specially-chosen of the Lord were being taken to their rest. With deep sorrow we have to announce the decease of Mr. Robert Menzies, of Leith, at Almeria, in Spain, on the 23d of September, at the early age of forty-one. He was a zealous and profound student and exponent of the Scriptures, in their relation to the restoration of Israel. As recorded in the August number of the Magazine, he was led by the divine teaching to the discovery of the chronological metrology in the measures of the Great Pyramid. To those who were privileged to know and understand him, he was endeared by all the graces which characterize the true Christian gentleman. With the keenest and most chivalrous sense of honor, were combined a fearless and transparent candor, and a heroic fortitude which enabled him to bear with cheerful resignation the progress of the insidious malady which eventually conquered the body, but left the spirit rejoicing to the last in the victory over death, by a plenitude of faith in salvation through Christ.

He was a laborious archæological student and lucid expositor. When interrupted by death he was at work on a separate yet connected history of the Ten Tribes, and had proposed to himself a history of Portugal, in which would be brought out the Israelitish element in its people. But it was not to be. In the midst of his work he was summoned to the communion of the just made perfect, and to receive the Crown of Righteousness

from the Captain of his Salvation. His end was peace, and those who mourn his loss may truly say :

"Bright be the place of thy soul !
No lovelier spirit than thine
Ever burst from its mortal control,
In the realms of the blessed to shine."

OBJECT AND BELIEF OF THE INTERNATIONAL INSTITUTE.

I.

The object is anti-French metric. The creed of the Institute is not so clear. In a general way the Institute may be said to believe in the substantial identity of Anglo-Saxon metrology and the metrology of the Great Pyramid. It has been well nigh demonstrated with mathematical exactness that the circular and time measure used in building the Pyramid is identical with the circular and time measure of Anglo-Saxon use; also that the British inch was the prime unit of linear measure in the Pyramid. It is believed by many members of the Institute that the ancient Pyramid measures of volume and weight are preserved in Anglo-Saxon weights and measures. The object of the Institute is to keep this ancient inheritance from being destroyed by the introduction of other systems of metrology. Its historical relations are of too great value that the Anglo-Saxon world should run any risk of its being overthrown or abandoned. As a metrological science it is far superior to that proposed by the French. It has been somewhat modified by the adoption of two kinds of weights and measures. It is believed by many to be a useless modification, such as two kinds of pints, one for liquids and one for cereals, and two kinds of pounds, one for fine and one for coarse weights. One object of the Institute is to eliminate from present Anglo-Saxon use all needless denominations of weight and measure, without destroying its identity. In doing this it proposes to retain the inch as the unit of linear measure; the pint as the unit of ca-

capacity measure; the pound as the unit of weight; the second as the unit of time, and the second of arc or $1''$, as the unit of circular measure. The work of the Institute is not revolutionary like the French method, but conservative on historical as well as scientific and practical grounds, like the history of the Anglo-Saxon world. It may be said that not a few members of the Institute believe that Anglo-Saxon metrology is substantially of divine origin, and is closely allied with the history of the covenant people of God, and will be henceforth identified with the dominion of the Anglo-Saxon race.

H. G. WOOD.

II.

Mr. Wood's statement of the object and creed of our Society is very satisfactory to me.

The objects are: The defense of Anglo-Saxon weights and measures against the attacks of the French metric advocates, and the study of the origin and history and merits of our system.

The creed of the Society, and the creed of its individual members, must not be confounded. The Society's creed is simply this: Anglo-Saxon weights and measures are better than French weights and measures, and therefore should never be superseded by them. Individual creeds range all the way from simple preference for our hereditary system to enthusiastic conviction of its divine origin and pristine perfection. The Society aims to discover and present facts, allowing each member to draw his own conclusions.

J. H. DOW.

III.

The object of the Institute is expressed in its name, but not with sufficient distinctness. Reading the words, "International Institute for Preserving and Perfecting Weights and Measures," a stranger naturally inquires: "What weights and measures?" and, "preserved from what?" He soon learns that the weights and measures to be preserved and perfected are the Anglo-Saxon, and that the destruction from which they are to be preserved is that which threatens them from the deadly at-

tacks of the Robespierrean French metre. Thus much being made evident, the word "International," with which the word "Institute" is qualified, clearly shows that the object of the Institute is to render the Anglo-Saxon weights and measures, by means of their preservation and perfection, worthy of adoption and use in the scientific and commercial intercourse of the whole civilized world.

As to the creed of the Institute, I think it clearly inferable from the object of the Institute, and from the means by which this object is to be accomplished. It is that the Anglo-Saxon weights and measures, notwithstanding the degree of corruption and degeneracy which they have undergone, are worthy of preservation, and that by restoration to their pristine perfection they can be made what they were intended to be, *i. e.*, truly international, beginning in the midst of the inhabitable world, where they are recorded in imperishable stone, and proceeding thence to the utmost bounds of human habitation. To this creed and the accomplishment of its object, so clearly expressed and implied in the very name of the Institute, every member of the Institute is supposed to subscribe and set his shoulder, with a faith that will remove hence the mountain of the French metre, and cast it into the sea, clearing the ground for the growth of the little stone into the great mountain that is to fill the whole world.

J. W. REDFIELD.

THE SACRED CUBIT, THE HOUR-ARC AND THE LAW OF GRAVITATION.

PROPOSITION.

The space through which a body descends in $\frac{1}{1000}$ of an hour, *in vacuo*, at mean latitude, near the surface of the earth, by virtue of the accelerating force of gravity, is precisely 2500 inches=100 geometric cubits=the side of a geometric square acre.

Haswell's constant would give $(16'-1'' = 192.80717 \text{ geometric inches}) \times (3\frac{6}{10} \text{ seconds})^2 = 2498.78117 \text{ geometric inch.}$, which may be taken as exactly 2500, in the present state of our knowledge.

Hence: the term "*pound-cubit*" is a vastly more cosmical expression than either "*foot-pound*" or "*killogramme-metre.*"

The following table exhibits the relations :

Elapsed time in 1-1000ths of an hour.	Acquired Velocity.	Squares of the Time.	Total Descent.	Ratio of Space Each Time.	Space fallen through each Interval of Time.
1	200 cubits	1	100 cubits	1	100 cubits
2	400 "	4	400 "	3	300 "
3	600 "	9	900 "	5	500 "
4	800 "	16	1,600 "	7	700 "
5	1,000 "	25	2,500 "	9	900 "
6	1,200 "	36	3,600 "	11	1,100 "
7	1,400 "	49	4,900 "	13	1,300 "
8	1,600 "	64	6,400 "	15	1,500 "
9	1,800 "	81	8,100 "	17	1,700 "
10	2,000 "	100	10,000 "	19	1,900 "

That is:

In $\frac{1}{1000}$ of an hour the descent= 1 cubit= $\frac{1}{100}$ acre-side.
 " $\frac{1}{1000}$ " " " " = 100 " = 1 " "
 " $\frac{1}{100}$ " " " " = 10,000 " = 100 " "
 " $\frac{1}{10}$ " " " " = 1,000,000 " = 10,000 " "
 " 1 " " " " = 100,000,000 " = 1,000,000 " "

Or ten times the polar axis.

JACOB M. CLARK.

New York, January 20th, 1885.

EXTRACTS FROM LETTERS.

FROM F. HESS.

FORT DODGE, IOWA.

I can recall just now no other nation than the Chinese who count their time by cycles of sixty years, which, by the way, is not a "Saros" period. The Mohammedans have a cycle of thirty lunar years, in the course of which they add eleven days to their year of three hundred and fifty-four days, making the second, fifth, seventh, tenth, thirteenth, sixteenth, eighteenth, twenty-first, twenty-fourth, twenty-sixth and twenty-ninth year of this cycle a leap year of three hundred and fifty-five days. But neither this nor a Chinese cycle of sixty years, nor any other cycle I can think of, came to an end on the ninth of September, 1774. As far as I can determine from the very few and perhaps not very reliable data I can lay my hands on just now, the ninth day of September, 1774, corresponds to the fourteenth day of the seventh month of the Mohammedan year 1188, since the Hegira—to the sixth day of the ninth month of the Chinese year 4410, which was the thirtieth year of the seventy-third sixty-year cycle of the Chinese era, and to the tenth or eleventh day of the last month of the Jewish year 5534.

This is as far as I can go in this direction at present, and quite far enough to show that this confusion of dates, arising from a multiplicity of calendars, is as inconvenient to the historian as a multiplicity of zeros of longitude and time is to the navigator.

According to my very rough calculations, September 9, 1774, was a Friday, or Venus day. New moon occurred on the seventh, and its descending node was in the vicinity of Antares in Scorpio, and the moon's path through Virgo went below Spica; at 4 P. M. on that memorable day, Alphecca, in the Northern Crown, was on or very near the meridian of Boston, at an altitude of about 74° , and Spica, with the crescent moon at her feet, about 33° above the southwestern horizon, so that your apocalyptic picture of a woman clothed with the sun, a crown of stars upon her head and the moon at her feet, fits your date of the birth of American liberty exactly.

By the way, have you ever studied the structure and different colors of the enclosures of the ancient astrological temple of Ecbatana in connection with the latest disclosures of the spectroscope concerning the different colors of the planets? And have you ever compared the ground plan of ancient Babylon, as described by Herodotus, with the Great Pyramid of Jeezeh?

F. HESS.

FROM F. A. R. WINTER.

DEMARARA, September 12, 1884.

Dear Sir:—Thinking over my suggestion to you upon the possible value of the subterranean measures of the Pyramid, I remembered having some years since made a calculation of the division of time by Esdras, taking the Hebrew jubilee as a basis, 50 years of year days = 18262 years, I got an approximation to the end of the dispensation on the ground that Esdras wrote some 300 years B. C. Friends in England threw cold water upon it and I let it pass; now, however, it came into remembrance, and with the experience gained in correlating the Pyramid measures with Bible chronology, I approached the subject with more confidence, and I think I have succeeded in correlating the subterranean

can and other measures of the Pyramid with the account of the creation in Genesis, and also with the division of the times by Esdras, on the above basis. Taking 18262 years from the creation of the earth, which then was void and without form, and darkness covered the face of it, and as it is only from the creation or manifestation of light to the earth that time can be computed by astronomical processes, the question arises: how long did the darkness continue? Assuming the period called a day = 2000 years, and light appeared after 1200 years had elapsed, then we date light 800 years before the completion of the first period; the five succeeding periods up to the creation of Adam will make 10800 years from light to Adam. Now the breadth of the subterranean chamber is $324 \times \pi \times 10 = 10178$ and 198 inches in pre-Adamite length of the passage to it $\times \pi = 622 = 10800$ from light to Adam; add to this 2116 to birth of Isaac and we have 12916 = 2170 B. C. One diagonal of the base of the Pyramid, half of one precession of the equinoxes, confirmed by the astronomy of the Pyramid, from thence 2170 to the nativity, makes 15086 years from light to Anno Domini. Now let us take the divisions of times by Esdras—18262—1200 = 17062 $\div 12 = 1421.8$. $1421.8 \times 10.5 = 14929$ assuming Esdras to have written 157 B. C., then $14929 + 157 = 15086 = \text{Anno Domini} + 1976 = 17062 + 1200 = 18262$.

I send the calculation based upon the Hebrew great jubilee of 50 years (Leviticus, xxv: 10-13), taking each day for a year $365.242 \times 50 = 18262$ years; comparing the narrative of the creative periods as given in Genesis i, and the creation of light on the first day, with the definition given in ii. Esdras, vi:40, shewing a correlation between the astronomical and chronological measures of the Pyramid, the Mosaic account of creation and the division of the times as given in ii. Esdras, xiv: 10-11-12. Assuming that each creative period called a day was equal to 2000 years, that darkness covered the face of the newly created earth for 1200 of these years before the creation or manifestation of light (ii. Esdras, vi: 40), then the first period was $2000 - 1200 = \dots \dots \dots 800$ years.
 Second, third, fourth, fifth periods of $2000 \times 4 = \dots \dots \dots 8000$ "
 Sixth period to Creation of Adam. $\dots \dots \dots 2000$ "
 From creation of light to Adam. $\dots \dots \dots 10800$ years
 From Adam to birth of Isaac. $\dots \dots \dots 2116$ "
 ————— 12916 years.

2170 B. C., birth of Isaac, one diagonal of the Pyramid, half one precession of the equinoxes:
 Isaac to the Nativity. $\dots \dots \dots 2170$ "
 Anno Domini = years of light. $\dots \dots \dots 15086$ "
 Christian dispensation. $\dots \dots \dots 1976$ "
 ————— 17062 "
 Add to period of darkness. $\dots \dots \dots 1200$ "
 ————— 18262 "

The measures of the subterranean chamber in the Pyramid and the passages leading thereto, are correlated to the foregoing thus:

Breadth of subterranean chamber $324 \times \pi \times 10 = \dots \dots \dots 10178$
 Part length of passage from end of descending passage, $198 \times \pi = \dots \dots \dots 622 = 10800$
 From creation of light to Adam. $\dots \dots \dots 10800$
 From Adam to birth of Isaac. $\dots \dots \dots 2116 = 12916$
 2170 B. C., one diagonal of the Pyramid.
 Isaac to the Nativity. $\dots \dots \dots 2170$
 Anno Domini = years of light. $\dots \dots \dots 15086$

Divisions of the times by ii. Esdras, xiv: 10-11-12. Taking the division from creation of the earth, including the period of darkness, a great jubilee: $18262 \div 12 = 1521.8 \times 10.5 = 15978 + 1976 = 17954 + 308 = 18262$; this would give $15978 + 308 = 16286 - 1200 = 15086$

time from light to Anno Domini, provided Esdras wrote 308 B. C. Or thus:

$$18262 - 1200 = 17062 \div 12 = 1421.8 \times 10.5 = 14929 + 1976 = 16905.$$

$$16905 + 157 = 17062 + 1200 = 18262.$$

$$\text{Or, } 14929 + 157 = 15086 + 1976 = 17062 + 1200 = 18262.$$

This gives the date of Esdras writing at 157 B. C. Is this coincidence or demonstration?

F. A. R. WINTER.

LETTER FROM S. BESWICK.

STRATHROY, ONTARIO.

My Dear Sir:—If the INTERNATIONAL is not printed yet, you might probably find a place for the following, which appears in one of my English exchanges.

S. BESWICK.

“UNIVERSAL TIME.”

“Shortly before midnight, on the 31st ult., the authorities at Greenwich made preparations to receive the year 1885. The public clock at the observatory was so altered that, instead of indicating twelve hours, or 12 o'clock, when the neighboring clocks were striking that number, it was set to 0 h, thus showing that the astronomer royal had taken the necessary steps for adopting ‘universal time.’ This change will render the beginning of the astronomical day coincident with that of the civil day.”

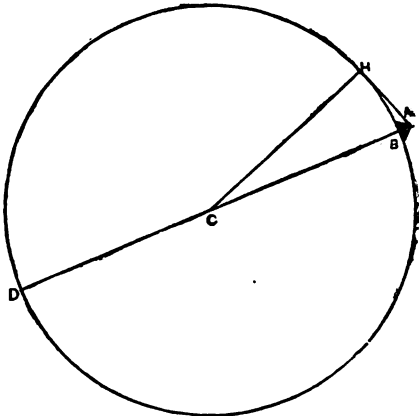
LETTER FROM JAMES SIMPSON.

16 PALMERSTON ROAD, EDINBURGH, December 10, 1884.

My Dear Professor Piassi Smyth:—Let me thank you, even at this late date, for your kind letter of first December.

I have wanted to correct some errors which occurred in mine of the 28th ultimo, but have somehow been hindered and must now trust to memory in doing so, for I kept no copy. Firstly in regard to polar compression theorem :

In the equation $AB : AH :: AH : AD$, AD is of course earth's diameter at the Pyramid and between M. terraqueous levels, plus Pyramid's own height. I was therefore wrong in working it out with the polar diameter 500,000,000.



As I cannot estimate the real length of AD let me call it hypothetically 501,134,000. Then will $AH = 26.9675$ English miles; and ratio AB to AH, or AH to $AD = \frac{1}{293^1.843}$. The ratio, however, of AH to polar axis 500,000,000, will be $\frac{1}{287^1.82}$; and ratio of AH

to equatorial diameter will of course be $\frac{1}{251.77}$; which last expression I take it is the proper one for polar compression, as resulting from this theorem, assuming the diameter at Pyramid to be as stated before. The amount of the correction is not great; yet in principle it is of some importance.

Now in regard to the musical or harmonic properties of the dimensions of the coffer, king's chamber, etc., what I wrote was very hastily done, and has, I know, several errors in it. The chromatic scale from middle C to C treble, tuned to equal temperament, may be obtained logarithmically thus:

Log. 2 =	0.3010300								Ratio
$\div 12$ =	0.0250858	= 1.0594603	= Common ratio.						of
				Wave L'gth. =		Wave L'gth.			Vib's.
Hence, taking—	1.4109160	= 25".75823	=	<i>c</i> treble.		25".75823		120	
we have	1.4360018	27.28927		<i>b</i>		27.47544		112 $\frac{1}{2}$	
	1.4610876	28.91263		<i>a</i> sharp		28.62025		108	
	1.4861734	30.63179		<i>a</i>		30.90987		100	
	1.5112592	32.45332		<i>g</i> sharp		32.19775		96	
	1.5363450	34.38310		<i>g</i>		34.34430		90	
	1.5614308	36.42762		<i>f</i> sharp		36.79745		84	
	1.5865166	38.59372		<i>f</i>		38.63734		80	
	1.6116024	40.88860		<i>e</i>		41.21318		75	
	1.6366882	43.32000		<i>d</i> sharp		42.93035		72	
	1.6617740	45.89590		<i>d</i>		45.79240		67 $\frac{1}{2}$	
	1.6868598	48.62503		<i>c</i> sharp		48.29740		64	
	1.7119456	51.51164		<i>c</i> middle		51.51646		60	

Over against this I have placed between double lines the same notes as derived from the simplest harmonic ratios, not always as recognized by musicians, but such as one might expect to find symbolized in the Pyramid.

I was wrong in stating that the wave length of *a* (30.90987) was one-third of 91.31, etc.; also that of *d* (45.79240) was half-length of coffer. The former, however, is $\frac{1}{10}$ diagonal of end of king's chamber. It was also a mistake to introduce, as I did, dimensions of ante-chamber—unless for an alternative pitch. In regard to pitch—concert pitch is, it seems, now reckoned in England at 540 vibrations per second—an enormous advance upon the 480 of 200 years ago. But surely a reaction must come, as the human voice cannot go on getting higher and higher. Rather, it may be found to have a periodical, secular, variation about a fixed mean which may give the Great Pyramid standard wave length exactly!

I should state that the names I gave as $C_1 C_2 C^1 C^2$, etc., are not exactly accordant with usage, but were for convenient expression of the number of octaves above or below that from C middle to B treble.

Your remark anent the traditional idea that the coffers gave out a certain normal note of great value, when struck, is most interesting. I wonder if any one could determine it by calculation from the laws of sound and the dimensions, shape, material and density of the coffer. I fear not. I have no acquaintance with the Gregorian chant. H. E. Dibdier, in the preface to his 'Standard Psalm Tune Book,' says: "—It has been suggested that the temple music of the Jews was incorporated with the early Ambrosian chant." And again: "The Ambrosian chant, the earliest Christian music of which we have any account, is itself lost, or probably absorbed in the Gregorian chant introduced by Gregory the Great in the early part of the seventh century." Some of the old German chorals—such as those adopted by Mendelssohn into his "St. Paul," are of extraordinary richness and power of expressing true devotion—not like many of the rather light, superficial, and even vapid and irreverent psalms and hymns of our sensuous days.

I remain, Dear Professor Smyth,

Yours very truly,

JAMES SIMPSON.

FROM REV. H. G. WOOD.

I have read the paper just received with letter from Piazzi Smith: That of the pendulum tends to confirm the result I have reached. Col. Herschel's computation for gravity *i. e.*, a body falling 5 seconds at the Pyramid, falls through 4819.50 inches. Hence the value of gravity is $\frac{4819.50 \times 2}{5^2 \times 12} = 32.13$, and the $\sqrt{32.13}$ is 5.672 = specific gravity or mean density of earth less the effect of centrifugal force in lat. 30°. On this basis a seconds' pendulum at the Pyramid would be 39.0657 instead of 39.0625, as I have it. This shows at all events that I am pretty close to the truth. But it may be that Col. Herschel's computation is for sea level and in a vacuum, whereas mine is for 215 feet above sea level and in the air. Now the air will make a difference of .0018 in the length of the pendulum, and 215 feet above the sea level will make a difference of .00042 inch. Deduct the sum of these .00042 + .0018 = .00222 from 39.0657 and we have 39.0657 - .00222 = 39.06348. One other element is to be considered. Col. Herschel's meridional ellipticity $\frac{1}{237}$. If the ellipticity be more or less than this it will slightly affect the result, but on the figures furnished by Col. Herschel, 39.0625 is almost certain to be the length of a seconds' pendulum in the king's chamber. I am quite content to let my theoretical pendulum 39.0625 stand as the true seconds' pendulum at the Pyramid. It is not material whether the precise position of it be at the level of pavement or in the king's chamber, but quite likely the latter.

Faithfully,

H. G. WOOD.

FROM PROF. C. PIAZZI SMYTH.

15 ROYAL TERRACE, EDINBURGH.

I wish to bring to your notice some interesting remarks of my correspondence—friend Col. A. T. Fraser, R. E., in charge of Government works at Trichinpely, Madras.

He had just been reading 'New Measures at the Great Pyramid,' and is still surprised at the finding of the pavement fragment. "A pavement," says he, "running all around the building, would not add to the appearance of the Great Pyramid, rather the contrary, in my opinion, as nothing can exceed the fineness of the contrast otherwise between rock and exact masonry. But it is difficult to imagine how the base was finished off, and I was not long enough at the place to form a clear idea. The roughness of the sockets in the rock is very strange (unless partly the effect of their exposure during the last twenty years to modern violence). Whereupon are the bases of it settled, or who laid the stone of its corner? (Job xxxviii: 9.) Their differences of level are admirably explained by the Rev. H. G. Wood, in the extract in your book. "The contrast between sloping rock and masonry would demand a bold angle and steep face, thus



and not a reëntering angle and pavement thus



but how it was actually constructed I could not determine.

"On the pavement portion, indeed, the casing stones run to a point



but the difficulty is with the corner stones and the sockets. In doing work of the kind I would either use mitred stones of this kind,



-or preferably



"I am somewhat inclined to think that the Great Pyramid was never completely cased ; and that the Howard Vyse line of casingstones we see, are a pattern course ; the work having been for some reason interrupted, and that the sockets themselves were never finally dressed or fitted with corner stones. The difficulty of dismantling such masonry would be enormous, and the pieces have not yet been positively traced to other buildings.

"I should much like to join the American expedition to re-measure the Great Pyramid, and could get leave for three months without affecting my interests, but I would like at least six, if the American expedition cared for my being on it and being associated with it.

"To me, it would be highly interesting, and more instructive than the results of what I could effect, or contribute, alone, to the solution of the problem.

"This country (India) is in such a state as regards public works that I am afraid of anything being carried out in my absence, if I were to take long leave just now. India is getting into the same mortgaged condition to bondholders that Egypt was before the people rose against the load in 1882, and that still keeps it in disquietude. Depend upon it, there is a risk of the Mahdi, if undisturbed in the upper Soudan, turning the Nile into the Red Sea !"

Thus it appears that next winter will be rather too soon for him ; and I suppose that is precisely the prudent conclusion of yourself and friends.

I remain yours very truly,

C. PIAZZI SMYTH.

FROM JAMES SIMPSON TO PROFESSOR PIAZZI SMYTH.

16 PALMERSTON ROAD, EDINBURGH, December 27, 1884.

It is curious to find Mr. Petrie, after putting aside the twenty-five-inch cubit theory, making approving mention of other earth-reference theories (p. 183) far less simple and philosophical, but quite as difficult for unaided human science of the Pyramid day to realize, as the lengths of various meridians and other circumferences of the earth, divided down into degrees and "miles." His various explanations of interior dimensions, by means of the "common Egyptian cubit," lineal or square, are far less simple, less connected and less rational than these offered by the sacred metrological theory, and require, too, a very elastic interpretation of the said common cubit, as being anything between 20.2 and 21.04 Br.—limits which look most absurd beside his remarks upon and measures of the exterior, and whole Pyramid where lengths of about 440 cubits show scarcely a greater error over all than is here assigned to single cubits by him.

But Mr. F. P.'s labors are most valuable as showing *what* the Pyramid builders could and did accomplish in the way of ensuring accuracy of line, angle, surface, level, etc., and *how* (although not *why*) they accomplished these things.

His explanation of the base-side as 440 cubits of 20.62 would look quite as well if stated at 22 lengths of the king's chamber (without reference to such a cubit), and the height (of the Pyramid) = 14 of the same lengths; giving the approximate π fraction by means of his short base, without disturbing the deeper astronomical meanings of the unit in which said fraction is expressed.

Touching that unit, as the square roots of king's chamber measures are:

"

For Length, 412.1318 = 20.30103

For Breadth, 206.0659 = 14.35499

For Height, 235.4377 = 15.34398

Sum = 50.00000 exactly,

is that not a subordinate proof that "inches" presided at the laying out of the dimensions of the king's chamber?

Yours truly,

JAMES SIMPSON.

FROM DR. EPH. M. EPSTEIN.

VERMILLION, D. T., November 30, 1884.

I have not ceased to think of you and the great work of your life, and when that meridian conference met and the measures of that wicked woman (Zechar., 5:8, read so, and not "wickedness.") were not even mooted for this country and England, I thought the Lord must have blessed the Institute. At any rate, the danger is over for the present. Nor do I fear that a Democratic administration will ever think of such a violent measure as to impose the metric lie on the people of this country.

I do not feel like criticising "The Unveiling of Isis." Me, the subject will never tire, but, alas, I know as well as you do, that many people are not like you and me. Few are prepared, at present, to appreciate the underlying truths of mythology, for the many are ready to cry "mythology" at the Bible and reject it on this account.

I began to think of the propriety of writing for the magazine a series of articles on Biblical and Talmudic weights and measures, originally examined from the original documents. In doing so I came on the altar of Ezekiel, 43:13, etc. I think the meaning of the measure "Zereth" may be determined there. But I am now so far from mathematics that I am not able as yet to see whether I am right or wrong. Can I lay the matter before you for analysis? Say yes, and I will send you a faithful translation and diagram of the subject. There is in that passage, I think, a clear indication of the pyramidal basis of the altar. Let me hear from you at once, or soon.

Yours affectionately,

EPH. M. EPSTEIN, M. D.

FROM PROFESSOR ASAHIEL ABBOTT.

Thanks for Professor Smyth's little review of Petrie, for I presume that it came from you. It is neatly done. Our Crapeau cousins have muffed, and not ventured to propose their measures to the convention at Washington, as they were refused last year in Europe. So that goes over for a while. I hope that the question of prime meridian will not be settled until they will all agree upon either Gizeh or Jerusalem, for this is where it should be. Gizeh is, in some respects, the best of the two, and there is left to us, without our

trouble or expense, the best conceivable and invariable model of just weights and measures for the benefit of all the world in coming times.

Yours truly, in haste,

ASAHEL ABBOTT.

FROM REV. J. A. UPJOHN.

You certainly have brought to the front the three great liberators: 1. Columbus, from narrow confines. 2. Luther, from ecclesiastical corruption. 3. Washington, from political bondage. It makes a suggestive picture, and I am glad to have the three associated in my mind.

I was interested in the article on the Sphinx. If his interpretation of the name, "he cometh," be correct, then there might be a reference to the babe, the lion of the tribe of Judah, in the arms of the virgin, coming towards that spot where He was hidden in Egypt, and there might also be a fulfillment of that prophecy in Isaiah, xix: 1: "Behold, the Lord rideth upon a swift cloud, and shall come into Egypt," 999 making the number of judgment. Wordsworth says of these words: "This passage has been applied by ancient Christian expositors (as Origen, Cyril and Theodoret) to the coming of Christ in person into Egypt (Matt., ii: 20), and to the effects of His divine presence there, to which Milton refers in his 'Ode to the Nativity':

"Peor and Baalim

Forsake their temples dim,

With that twice battered God of Palestine;

And moonèd Ashtaroth,

Heaven's queen and mother both,

Now sits not girt with tapers' holy shrine," etc.

Yours truly,

J. A. UPJOHN.

FROM REV. E. P. INGERSOLL.

Many thanks for your letter and the November number of the Magazine. It is a wonderful number—wonderful by every article it contains. Indeed, I have no hesitation in saying that every article must have been written under the divine direction. As to my own article, I can say with truth that I never could have written such an article with my own unaided power. Indeed, I often tremble, not with fear but joy, joy unutterable, at the evident approach of the Divine Spirit and His overshadowing power when I am writing or speaking on this wonderful subject of the "Identity," the fulfillment of the divine promises made to our fathers. My brother, God is revealing himself now, as it seems to me, in a most wonderful manner. His language to the world now is in tones so clear and so emphatic that all must hear, whether they will or not.

Whence this mighty impulse given to the whole human family, the like of which the world has never felt before? Infidelity—was it ever so rampant before? The history of the world gives us no account. And whence comes this mighty awakening of the whole Christian world—the Anglo-Saxon race—to preach the gospel in all lands, to every creature? This influence is not human in its origin—nothing but the Divine could ever have produced so mighty a movement. The time must ere long come when the great shout shall be heard: "That the righteous of this world have become the kingdom of our Lord and of His Christ."

In love,

E. P. INGERSOLL.

FROM REV. ALEX. MACKAY, M. A., LL.D.

VENTNOR, T. W., November 7, 1884.

Accept my best thanks for sending me *THE INTERNATIONAL STANDARD* for September of this year. I have read it very carefully, and find it brimful of deeply interesting matter relative to the Great Pyramid. The various articles are ably and eloquently written by men of the highest learning and scholarship, and would do honor to any first-class quarterly in this or any other country.

Yours faithfully,

ALEX. MACKAY.

FROM JAMES M. DURKEE.

I desire to call your particular attention to the views of Mrs. E. Bedell Benjamin, relating to the "Sphinx." She has reached the same conclusion which I had arrived at a year ago, and sent you in a printed paper, entitled, "Voice from the Pillar." She has "searched it out" by the constellations and lines in the heavens, and found it out by the "visible signs" on earth and the constellations of humanity! Would it be asking too much that my view may be stated in the next number of the Institute, and so expressed last December (or 1883) to wit: That the Sphinx was *intimately* connected with the Great Pyramid and symbolized as expressed in my paper, "The Watch of God."

"The Field of Zoan, in Egypt," is a great book; the pyramids are only illustrations. The dust of ages is going to be "brushed off." The angels of God are going to ascend "Jacob's Ladder;" but the angels are human beings, God's messengers of truth. We have to do with that by and bye. The world and even Christians put God too far away. He is near.

Yours truly,

JAMES M. DURKEE.

FROM J. L. DAMPIER.

LONDON, ONT., December 19, 1884.

The more one thinks of the series of links in the "Unveiling of Isis," the more one is impressed with the divine design of foreknowledge being brought to light therein. Now in these times when everything is tested, questioned and brought to the fore; when earth is casting up buried relics of past ages of Egypt, Assyria, Greece and Rome, shall His chosen people be without their signs, marks and footsteps, along and down the well-trodden paths of the ages? Shall Babylonians, Persians, Medes, Grecians, Romans, be made the subject of deep Scriptural language, and the fifth kingdom vanish in the idle fancies of a dream, or in a spiritual existence which we cannot see, take hold of, touch or handle? Shall men like Nebuchadnezzar, Cyrus, Alexander, come forward as leading actors on the world's stage, so much so as to be named in His Word, and His chosen people lie silent in the tomb? No. Let us be assured that this cannot be. These nations, peoples and men have been brought on the stage of life as aides subservient to His will and grand scheme. Is it more wonderful, out of the way or contrary to reason, to ascribe to such good and great men as Columbus, Luther and Washington, acts and deeds emanating from the same guiding hand as brought to the fore and made use of those great and mighty sovereigns before mentioned. No, but far more within the bounds of reason and common sense when we compare the three with those who have gone before, or have passed o'er the stage up to this time. Have we not examples enough in our own time of the power of genius, "That quality without which judgment is cold and knowledge is inert." Coming to the fore wonderfully, yes, we may say, miraculously, with inspiration with regard to the great men who have so prayerfully and earnestly taken up the grand

and absorbing questions of the day. "The Great Pyramid" and "Anglo-Israel," what a deep searching of the Scriptures they have occasioned, bringing to the light deeply hidden passages which were never understood, neither could have been, without a knowledge of these subjects.

Is not God the same yesterday, to-day and to-morrow? He changes not, but we do. This age does not associate in its mind the same idea of God as when reading of the God of Abraham, Isaac and Jacob. People seem to imagine that there is now a different state of things, a different dealer with the affairs of life; so that when prominent men are brought forward and spoken of as characters in close alliance with Him, and as acting and doing under His guidance, as Columbus before braving the unknown waste of waters, sailing he knew, not whither; Luther before casting down the gauntlet at the feet of the Pope, and Washington before fixing bayonets against the powerful armies of Ephraim, if such men (in these degenerate days of thoughts upon God and his deeds) are spoken of as devout and holy men, inspired by God and led by him, the writers are laughed to scorn. If such deeds are ascribed to them as brought forward in the "Unveiling of Isis," the ascribers are termed fanatics or lunatics, promulgators of a new religion. Thus, these railers, by their sarcasm, unveil their weakness and ignorance, and their skimming, surface reading of the Divine Book. To us it is most comforting and assuring to see what at first appeared a most complicated and entangled rope laid in regular coils upon the deck ready to sustain the anchor of our hope, that we are His chosen people, and that the Pyramid was built by His command and sealed unto the day of revelation. Oh, weak in faith, rest assured that the God who interested himself in the building of the ark, the tabernacle and temple, also garnished the Heavens with the "Serpent and the Cross," built the Pyramid a perfect symbol of earth, spoke and conversed with all the patriarchs of old and prophets up to Malachi, then spoke to us by His Son, and hath since then spoken in divers ways and manners to man.

J. L. DAMPIER.

FROM JACOB M. CLARK, C. E.

I notice that Professor Tylor, of Oxford, England, stated to the National Academy at Newport, among other things, in reference to the North American Indians: "The prevalence of the *five-pointed star* of the Asiatic Magician was paralleled among the Indians, too."—[*N. Y. Tribune, Oct. 16.*]

In the same paper, the announcement of the discovery of a new asteroid, by Palisa, at Kiel, Germany, affords an illustration of the advantage of the geometric over the prevalent system for expressing co-ordinates in astronomy.

	TERMS OF ARGUMENT.	CURRENT METHOD.	GEOMETRIC. 240° TO THE CIRCLE
	Greenwich Mean Time,	4.033	40°.33
	Right Ascension.....	2 h. 18 m. 26.3 sec.	23.073
Epoch, Oct. 14, 1884.	Declination.....	plus 13° 47' 11"	+ 9.1907
	Daily Motion.....	West (time) 56 seconds.	W. 0.1611+
		South (arc) 6 minutes.	S. 0.0666+

The Metrological Society are flooding the land with their pamphlets in the interest of French metrics. There are many things firmly believed in by us (though with minor differences) which are unintelligible to the masses, and which they will not stop to investigate; yet the world will come in, in the appointed time. Therefore, I think much effort should be now directed towards diffusing knowledge of the scientific basis and the peculiar convenience of our fundamental units *in themselves*, in such plain terms that the hum-

blest people can understand it. Jurists should be particularly advised on these matters.

Mrs. E. Bedell Benjamin's article on the "Sphinx" contained much that was **decidedly** new to me. It will attract much attention.

Truly yours,

JACOB M. CLARK.

FROM LIEUTENANT TOTTEN.

November 30, 1884.

Mr. Edward Hine, the great advocate of Anglo-Israel, has been out here staying with me. He has come to America to thoroughly lecture over it, and I pray God will have eminent success. You must give him a large meeting in Cleveland when he reaches you. You will enjoy his conversation. His personal copy of the Bible is a wonder. He has underscored in red all verses which refer to Israel, in blue all to Judah, and in green all to the Gentiles, and it reads like a new book.

The "Unveiling of Isis," and the secret of it, lies in England and America, as his "chosen people." Oh! that all the world could have to-night a present of Hine's "47 Identities," and not sleep till they had read them. What an awakening we would have to-morrow. I sincerely trust his mission will be blessed on this continent. I am now devoting my time to a study of certain lines of history relating to this phase particularly, and have made some very astonishing Anglo-Saxon synchronisms on to the times of the Gentiles as tabulated in H. Grattan Guinness' work, "The Approaching End of the Age." I can run Anglo-Saxon chronology on to the scheme of Guinness in such a way as to startle the "wise," though the wicked will continue to close their eyes to the truth. I believe 1885 is to be a very important year in Anglo-Saxon history, and probably in that of the whole world.

LIEUTENANT TOTTEN.

FROM ARCHDEACON STOCK.

WELLINGTON, NEW ZEALAND, November 22, 1884.

I was delighted to hear from Professor Piazzi Smyth that your Society was determined to explore thoroughly the Pyramid, and hope that you will be able to commence work at an early date. I have long thought that if the rubbish on the north side were removed discoveries of no small value would be made—that there is a second entering passage, running under and parallel to the first passage, concealed by the north side pavement. My reasons are, that there is such a passage in the second pyramid, confessedly a copy of the first; Herodotus speaks of the burial of Cheops in the Great Pyramid; that this is indicated by the vertical position of the side-walls' stones at one portion of the descending passage, and that diorite fragments were found in abundance by Professor Piazzi Smyth amongst the rubbish on the north side, while there is as yet no diorite work found in the Pyramid.

Mr. Petrie has suggested that the level of the Pyramid base line must be taken from the level of the pavement. It would seem to be more in accordance with the intention of the Pyramid architect to conceal his design, that the true base line should be hidden by the pavement.

Yours obediently,

ARTHUR STOCK.

LETTER FROM JAS. SIMPSON.

16 PALMERSTON ROAD, EDINBURGH, November 28, 1884.

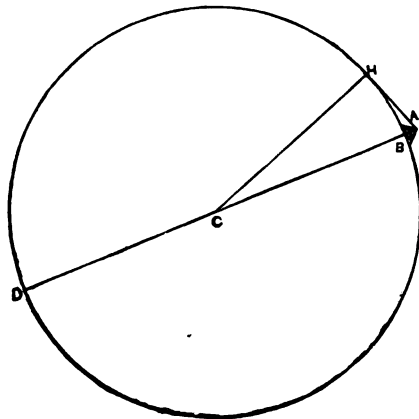
My Dear Professor Piassi Smyth:—I have been too long in acknowledging your kindness in sending me Colonel Herschel's valued memorandum on the pendulum. I have copied it for future reference, and now return it. I must say that, whatever objections the colonel may have to Great Pyramid testimony on scientific matters, he has shown an excellent spirit in answering so promptly and succinctly the enquiries you were so good as to put to him in regard to gravity representatives at the Great Pyramid. He makes :

Length of 5 sec. pendm. there= 976.65 inches }
 and drop of stone in 5 sec., or $\frac{\text{gravity}}{2} = 4819.50$ inches } = 5796.15 B. ins. = 5790.56 P. ins.

a quantity which he considers can only very slightly be affected by local causes. I would merely note that this quantity (or indeed any other estimate for the same conditions, or even varying the elevation within the Great Pyramid's height, etc.) is contained within the various limits for height which the building, with its sunken sockets and added pavements, must needs have. The quantity, in fact, is there—with or without the meaning I have fancied for it, and which is sadly in want of a reason annexed for conjoining two diverse measures of gravity in the same straight vertical line. If the Pyramid's centre of gravity were at 976.65 above the base (which is not likely), and the component masonry below and above that point were adjusted to two different but related means (related also simply to the moon's mean density), some such arrangement would go to strengthen, if it did not altogether justify, the idea put forward.

Colonel Herschel assumes ellipticity (I suppose, for all meridians,) at 1:290. I had thought that, of late, the mean was believed to be more nearly 1:300. Perhaps you will forgive allusion to an old idea I propounded (January, 1873,) as to ratio of Pyramid height to earth's diameter being the square of earth's meridional ellipticity, as thus :

Height (say) 5813 P. ins. : 500,000,000 P. ins. as 1 is to the square of 293.28, which I supposed might be the ellipticity of the meridian passing through the Pyramid itself. An idea, this, which arose from a simple geometric proposition, as in diagram below, where



$AB \times AD = AH^2$ (a property of the circle). If $AB = 5813''$ and $AD = 500,000,000''$, then $AH = 1,704,846'' = 26,7448$ English miles. That is the distance which could be seen from the top of the Pyramid, 5813 high, over the surface of a sphere coincident with the

plane of its base, and is at the same time the polar compression applicable to or arising from or giving rise to an ellipticity of meridian of 1:293.28 (as above)—a curious coincidence. I must apologize, however, for this reference. That there seems no limit to what the Great Pyramid may have to tell us about the deep things of time and space both in earth and heaven, seems suggested by the wonderful discovery by Professor Pliny E. Chase, to which you draw attention at the end of your telling reply to Rev. Dr. Barnard's attacks on Great Pyramid metrology.

I would close by a reference to another matter which I fear you may consider an extravagant fancy. Such as it is, let it speak for itself. I was struck lately with the statement that sound travels at the same rate, whatever be the pitch. Hence it would seem that the velocity of sound per second, divided by the vibrations per second of any musical pitch, gives the wave-length of that pitch. A rough trial of the case of treble C sharp gave wave-length somewhere about 26.7 inches, suggesting at once coffer's interior breadth and the question: Is there music in the coffer? Pitch, however, is a moveable thing, varying with age, country and fashion, and seems to have risen in England, since A. D. 1699, from 489 vibrations per second for treble C, to 528, the number presently in favor, though many preferred 512 when the matter was discussed. Then sound travels quicker in increased temperature by nearly one foot per second per degree Fah., and also if its intensity is increased. Hence, the fixing of wave-lengths must be subjected to "conditions," and vary with these very sensibly.

Now, 528 vibrations per second for a velocity of 1134.485 feet per second, which is somewhat conformable to a temperature of 68° Fah., gives a wave-length for the *middle C* (between treble and bass clefs)=51.516 P. inches. This line (of powerful coffer, king's chamber and Pyramid significance) seemed decidedly the best connecting link, especially as 51.516, etc., is recognized as a "modulus" governing nearly all the measurements of the coffer—lineal, superficial and cubical. We have, therefore, at once:

	Wave-length.
Middle C	264 vib., 51.516.
C ₁	132 " 103.033.
C ₂	66 " 206.066.
Lowest C in pianoforte	C ₃ 33 " 412.132.

All familiar numbers and lengths. If, again, we take the octave between C and C₁ we have:

- (1) G $\frac{3}{4} \times 51.516 = 34.344$
- (2) F $\frac{2}{3} \times 51.516 = 38.637$
- (3) E $\frac{3}{5} \times 51.516 = 41.213$
- (4) D $\frac{3}{4} \times 51.516 = 45.792$
- (5) A $\frac{3}{8} \times 51.516 = 30.910$
- (6) B $\frac{1}{3} \times 51.516 = 27.475$
- (7) C¹ $\frac{1}{2} \times 51.516 = 25.758$

(1)=depth of coffer; (2) breadth of coffer; (3) height of coffer; (4) half length of coffer approximately, or perhaps diameter of circle having area = area of outer end of coffer; (5) side of square equal in area to inner end (this is theoretically exact, if depth 34.344 and angle of diagonal 51° 51' 14"); also 30.91 × 3 = 92.73; (6) this is too long for inner breadth, as (7) is too short. Hence it has to be admitted that the analogy is not perfect throughout. It must be remembered, however, that the temperature of a keyed instrument modifies the pitch of most of the notes, and this gives room for theory. Again: harmony depends upon the frequency of coincidence of the waves of sound, *i. e.*, upon the simplicity of the ratio between the vibrations per unit of time of the two notes, as 2:3, 3:4, 3:5, 5:8, etc. Yet the musical scales as used in vocal and instrumental music do not employ all the possible simple and therefore harmonious intervals, but only

some of them. For example, the ratios 4 : 7, 2 : 7, 1 : 7, are not in use, yet they produce fine harmony ; and the same may be said of others not employed by man.

You will perceive that in this rambling letter I have only indicated what might, in good hands, prove a profitable field for investigation. The enclosed diagram may aid you in understanding my rather insufficient explanations.

Alternatively coffer breadth might be taken at 116.260 ÷ 3, as in column 2, and from thence Bb above bass cleff=58.13 ; lower octave, 116.260.

The longest and shortest dimensions shown in king's chamber are (100:1)—

Cubic diagonal.....515.164, and

Extra wall depth (cir) 5.151,

and waves of such lengths respectively are near the lower and upper limits of man's music. With thanks, I remain,

Yours very truly,

JAS. SIMPSON.

Professor Piazza Smyth, 15 Royal Terrace, Edinburgh.

TRANSACTIONS OF THE OHIO AUXILIARY SOCIETY OF THE INTERNATIONAL INSTITUTE.

November 5, 1844.

Mr. A. M. Searles, Vice-President of the Ohio Auxiliary, occupied the chair.

Communications referring to the charter were read from Jacob M. Clark and Colonel Stephen M. Chester. A letter was read from Mr. J. Leyland Feilden in favor of the meridian of Jerusalem for the prime. A paper of Mr. George C. Davies, addressed to the metrologists of the Institute, was read by the Secretary.

The fifth annual convention was held at 2 P. M., November 11th.

Mr. A. M. Searles was appointed chairman of the meeting. The minutes of the fourth annual convention, the address of the President, the reports of the Treasurer and Secretary were read and approved, the constitution and the charter were discussed. A committee was appointed to prepare an amended constitution. It consisted of Rev. H. G. Wood, chairman ; A. M. Searles, J. H. Dow, Charles Latimer and Dr. J. W. Redfield.

At the evening session papers were read by Rev. H. G. Wood and Dr. J. W. Redfield. A paper of Coleman Sellers on "The Metric System" was also read. The convention then adjourned to meet at the call of the President.

November 19.

Rev. Alex. Mackay, M. A., LL. D., Ventnor, I. W. ; George Chipman, Idaho Springs, Col. ; James P. Trott, Niagara Falls ; Samuel Murphy, Nashville, Tenn. ; Richard Pomeroy, Georgetown, Col. ; E. H. Stimson, C. E., Denver, Col. ; were elected members. Mr. A. M. Searles gave his report of the work accomplished at the annual meeting with reference to the charter. Letters were read from Rev. Alex. Mackay, J. E. Hilgard, Professor I. Vail and C. B. Whyte, and papers from Colonel Stephen M. Chester and J. K. Hornish. The adjourned annual meeting was appointed for Wednesday, December 3.

December 3.

Rev. E. Craven was elected an honorary member.

The report of the Committee on Constitution was read. After discussion it was decided that the present headquarters of the Society should be in Cleveland, as THE INTERNATIONAL STANDARD, the organ of the Society, is there published. It was shown

that the Society was free from debt, and that no officer of the Society had the right to contract any debt for which the Society could be held responsible.

A committee on nominations of officers and committees was appointed; it consisted of Roland D. Noble, chairman; Dr. J. W. Redfield and James S. Lawrence. The officers elected were: President, Charles Latimer; Vice-President, Lucian I. Bisbee; Secretary, Mary B. Sanford; Treasurer, A. M. Searles; Trustees, Rev. H. G. Wood, General C. B. Norton, A. M. Searles, Clark Fisher, Charles Latimer.

Committee on Weights and Measures—Rev. H. G. Wood, chairman; Professor Piazzi Smyth, Lieutenant Totten, Jacob M. Clark, C. E.; W. H. Searles, C. E.; S. F. Gates, M. E.; Charles Latimer, C. E.; J. E. Hilgard, Chief United States Coast Survey; J. Ralston Skinner, Samuel Beswick, C. E.; Professor N. B. Wood, Professor Alfred Taylor.

Committee on Weights and Measures of different States—James S. Lawrence, chairman; H. M. Addison, George C. Davies.

Rev. H. G. Wood then read and illustrated on the blackboard a paper on "Metrology," which appears in this number of the STANDARD. After discussion, the convention adjourned to meet at the call of the President.

December 17.

Mr. James S. Lawrence presented his report of statistics, obtained from the Governors of different States and Territories, relating to the weights and measures in use. Mr. W. H. Searles was added to this committee. J. K. Hornish was added to the Committee on International Weights and Measures.

The President then read the report of the committee.

The President then read the ninth report of the Metric Committee on Weights and Measures. It is signed Charles H. Swan, Fred Brooks and Clemens Herschel. The determination of the metric advocates to accomplish their ends is plainly shown by this circular. On the other hand, the International Institute will take an energetic action to sustain its hereditary units.

Papers were read from James P. Trott, of Niagara Falls, and from J. K. Hornish, of Denver, Col. Letters from Rev. Alex. Mackay, Mrs. E. Bedell Benjamin, Rev. E. P. Ingersoll, James M. Durkee and W. Leconte Stevens, were read.

December 31.

In the absence of the President, Mr. A. M. Searles, Vice-President of the O. A., occupied the chair.

George Ingersoll, of San Francisco, Cal., was elected a member. The creed of the Institute, formulated by Rev. H. G. Wood, with comments by J. H. Dow and Dr. Redfield, was read. A letter was read from Mrs. E. Bedell Benjamin which contained a request that such a creed should be written. The writer was not aware of the action of Mr. Wood with regard to it. Professor N. B. Wood exhibited the half yard steel bar prepared for the Society by Professor W. A. Rogers, of Harvard College. An article from the *Evangelical Churchman*, Toronto, was read. It ridiculed the work of the Institute, and termed its adherents followers of the "Pyramid religion." The paper was discussed and its statements controverted.

JANUARY 14, 1885.

Mrs. James Le Boutillier, of Cincinnati, and Mr. James H. Osborn, of this city, were elected to membership. A letter was read from Archdeacon Stock, of Wellington, New Zealand, a distinguished Pyramid student, who gave some new theories of extra passages and chambers in the northern part of the Pyramid. A letter was also read from Mr. F. A. R. Winter, of Demarara, Guiana, on the religious symbolism of the Pyramid. A letter which had been sent to the Astronomer Royal of Scotland, Piazzi Smyth, from Mr. James Simpson, of Edinburgh, Scotland, upon the relations of the pendulum to the Pyramid, also the diatonic scale of music relating to weights and measures, and especially to the

coffer of the king's chamber, was read. This was illustrated by Mr. W. H. Searles upon the blackboard.

The idea of music having anything to do with weights and measures was a very novel one, and especially that there was any such relation in the measures of the coffer of the king's chamber. Rev. H. G. Wood also presented the same idea two weeks previous to the receipt of the Simpson letter. No sooner had the paper been read and explained by Mr. Searles than Dr. Redfield brought out a paper from *Mechanics* for January, 1885, a journal of engineering and mechanical progress. The paper read was entitled, "Chinese Music, Weights and Measures," giving a curious account of the origin of the Chinese weights and measures and musical notes, from a paper read before the German Asiatic Society, by Dr. Wagener, it shows that Lyng-lun invented a system of weights and measures by fixing the length of the reeds which gave certain keynotes, and from these notes, obtained by the length and width of reeds, weights and measures are also regulated, also coinage, and from this Dr. Wagener says positively: "It appears from this account that in China weights, measures, coinage and the tuning of musical instruments have been derived quite consistently from a constant unit supplied by Nature herself, and that the essentials of this system are over 4,600 years old."

A paper was also read, sent to the Society, by Mr. J. L. Dampier, London, Canada, and from Mr. Cox, of London, upon the "Mystery of Numbers."

Rev. H. G. Wood, of Sharon, Pa., sent a memorandum of discoveries in the coffer measures, showing the precise relations to all of the Hebrew measures and their relation to circular measure, and showing the connection between the coffer measures and the measures of the king's chamber.

MONTHLY RECEIPTS FROM SUBSCRIBERS TO THE INTERNATIONAL STANDARD FROM NOVEMBER 1ST TO JANUARY 21ST.

NOVEMBER—Charles B. Whyte, \$3; Samuel Murphy, \$12; Edward C. Frisbee, \$10; S. H. Reeve, \$2; Rev. Alex. Mackay, \$6.33; James P. Trott, \$2; Miss Bertie Oviatt, \$2; Miss Quirk, \$2; James S. Lawrence, \$4; F. A. R. Winter, \$10; Hon. Nathaniel Safford, \$2. Total, \$55.33.

DECEMBER—Mrs. Mary S. Bradford, \$12; Dr. P. W. Taylor, \$2; Boston Public Library, \$2; J. L. Dampier, \$4; W. K. McAllister, 40 cents; J. U. Drew, \$2; T. H. Pease, 25 cents; Mrs. E. Bedell Benjamin, \$3.50; Jesse Opperman, C. E., \$3; Rev. E. P. Ingersoll, \$5.05; Prof. I. N. Vail, 25 cents; W. H. Searles, \$2. Total, \$36.45.

JANUARY—Boston Public Library for bound volume, \$3; Mrs. James Le Boutillier, \$4; Rev. M. Murphy, \$2; W. H. Barnett, \$2; J. H. Dow, \$4; Dr. John Forrest, \$2; Cleveland Public Library, \$2; P. Collopy, \$2; W. J. Gilbert, \$1.70; T. H. Pease, 50 cents; Mrs. Jane Copeland, \$2; Colonel S. M. Chester, \$2; Mrs. J. R. Smith, \$2; Richard Bull, \$2; P. H. Stewart, \$2; Gustav Vogelsang, \$2; Dr. J. V. Reynolds, \$2; Clark & Carruth, for Boston Public Library, \$2. Total, \$39.20.

EXTRACTS FROM PROCEEDINGS OF A MEETING OF THE NEW YORK AND NEW JERSEY BRANCH OF THE INTERNATIONAL INSTITUTE.

Rev. A. D. Barber responded to the call of the president and mentioned that a just system of weights and measures was one of the most important and practical subjects that we are ever called to consider. It was important because it involved the doing of right or wrong in a large part of our intercourse with our fellow men. It was practical, because it was the subject of Divine command. A just and practical standard would be one adapted to the nature of things, to the physical organization, and to the moral improvement of man. The units of such a system would be simple, always at hand, ready and easy to use. Such a system we have, in part, in our Anglo-Saxon system. Some of the leading units of the Anglo-Saxon system are taken from the members of the human body, and are the first that are named in history. Mr. Barber did not propose to treat generally the subject, but to quote authority against the French metric and in favor of the Anglo-Saxon system, viz: that of John Quincy Adams. Mr. Adams began his investigation of the subject of weights and measures in 1810, when he was Minister to Russia. He pursued it with his usual industry and persistence for more than ten years, studying the Hebrew, Greek, Roman and French systems, in order to come to the best conclusions, considering also the philosophical and moral principles involved in the subject. In 1821, he made a report on the subject to the Congress of the United States, a report which his biographer well calls a "solid and magnificent monument of research and reflection which has not been superseded by any other treatise." Mr. Adams' own estimation of his works is given in his diary, where he speaks of two most remarkable transactions of his life: First, was the exchange of papers respecting the Spanish treaty; second, his report to Congress on weights and measures. He further says: "I have no reason to expect that I shall ever accomplish any literary labor more important to the best ends of human exertion and public utility, or upon which the remembrance of my children may dwell with more satisfaction." Of the metric system, Mr. Adams says: "I approve and disapprove the French system. I admire its design and the spirit and perseverance with which it has been pursued. I think it erroneous in some of its principles and impracticable in many." He advises Congress not to meddle with the system, but consider if, in adopting the metric, they would not cause many more evils than they would cure. He also maintains that the present diversity and difficulties in respect to weights and measures have resulted from impractical legislation and from the theories of impractical theorists. Mr. Barber also quoted Sir John Herschel as essentially agreeing with Mr. Adams against the metric system.

Mr. O. P. Hatfield, treasurer of the American Institute of Architects, in response to the call of the president, explained that he was present simply as a listener, and for the purpose of understanding the objects of the Institute, but without desiring to advance at this time any special views; that from the notice he had received, he had not understood that he had been invited to attend except in place of the secretary of the architects. He thought the architects of this country desired a decimal system, but were not generally in favor of the French system on account of the inconvenient length of the French metre, and its want of adaptation to any recognized measure. At present the architects were using the foot, and would prefer a decimal subdivision rather than the duodecimal as a matter of convenience; that since listening this evening he was favorably impressed with the plan proposed by Mr. Clark and Mr. Tottem, based upon acre, and, correlatively, the inch. The architects are using the foot without prejudice against any decimal system which may prove to be better than one based on that as a unit.

Mr. Hatfield's address was eminently conservative in tone, and exceedingly instructive.

TREASURER'S REPORT.

TWELVE MONTHS ENDING NOVEMBER 8, 1884.

RECEIPTS.

Balance last statement.....		\$ 42 76	
MEMBERS—Annual Dues.....	\$ 861 30		
" —Sustaining Fund International Standard...	408 44		
		<u>1,269 74</u>	
CHARLES LATIMER—Witch Hazel Mining Company..	\$1,351 21		
" —Private Account.....	354 65		
		<u>1,705 86</u>	
			\$3,018 36

SUMMARY.

Receipts.....	\$3,018 36	
Disbursements.....	2,991 08	
Balance.....		<u>27 28</u>

COMPARATIVE STATEMENT.

CASH ACCOUNT—NOVEMBER 8, 1879 TO NOVEMBER 8, 1884.

1879—1880.		
Receipts (Estimated).....		\$1,000 00
Disbursements (Estimated).....		<u>1,000 00</u>
Balance on hand November 8, 1880..		\$0,000 00
1880—1881.		
Cash on hand—Balance last statement.....	\$ 0,000 00	
Receipts.....	3,287 76	
		<u>3,287 76</u>
Disbursements.....		<u>2,326 39</u>
Balance on hand November 8, 1881.....		\$961 37
1881—1882.		
Cash on hand—Balance last statement.....	\$ 961 37	
Receipts.....	761 34	
		<u>1,722 71</u>
Disbursements.....		<u>1,636 84</u>
Balance on hand November 8, 1882.....		\$85 87
1882—1883.		
Cash on hand—Balance last statement.....	\$ 85 87	
Receipts.....	2,298 79	
		<u>2,384 66</u>
Disbursements.....		<u>2,341 90</u>
Balance on hand November 8, 1883.....		\$42 76

1883—1884.		
Cash on hand—Balance last statement.....	\$ 42 76	
Receipts	2,975 60	
	<hr/>	3,018 36
Disbursements		2,991 08
		<hr/>
Balance on hand November 8, 1884.....		\$27 28
SUMMARY.		
Receipts—Five years ending November 8, 1884.....	\$10,323 49	
Disbursements—Five years ending November 8, 1884.....	10,296 21	
	<hr/>	
Balance on hand November 8, 1884.....		27 28

EDITORIAL NOTES.

The article upon "The Identity of the Anglo-Saxons with the Lost Ten Tribes of Israel" has aroused more universal interest than any previous paper in our Magazine. Many have expressed surprise that they had not heard of this subject before, and are now earnestly investigating it. There is a great truth in it, and it is worthy of the careful research of all students.

We have received from Mr. F. Hess, of Fort Dodge, Iowa, a copy of *The Daily Chronicle* of that place, containing an admirable review of THE INTERNATIONAL STANDARD for November. Other members have likewise had notices of the Magazine published in the newspapers of their respective towns. May we ask that each member will endeavor to do this, and thus increase our subscription list? If the Magazine ever becomes a paying institution, the proceeds will be religiously devoted to the work of the Institute.

We have received "The Ninth Report of the Committee on the Metric System of Weights and Measures." A few years ago, at a meeting of the "Boston Society of Civil Engineers," only eleven members were present. Seven of these favored the metric system, and advised Congress to make its use compulsory.

This report is an outcome of that action. A committee of three civil engineers gives advice to the medical fraternity of the country, though many members of that fraternity have declared against the metric system, though the surgeon-general of the army has said that its introduction would cause thankless and unnecessary labor, would waste much precious time, and might endanger life.

The International Institute has received from Prof. W. A. Rogers, astronomer, Cambridge, Mass., a standard 18-inch bar of tempered steel having a highly polished surface. At one end there are four thousand lines in four-tenths of an inch. The remainder of the bar is graduated to tenths, one hundredths and one thousandths of an inch. These graduations can be plainly seen under the microscope accompanying the bar. The work has been done with machinery which Prof. Rogers has perfected. The bar has been placed in the care of Prof. N. B. Wood, who has charge of the Society's balances.

REVIEWS.

FACTS AND DATES, OR, THE LEADING EVENTS IN SACRED AND PROFANE HISTORY, AND THE PRINCIPAL FACTS IN THE VARIOUS PHYSICAL SCIENCES, the memory being aided throughout by a simple and natural method, by the Rev. Alex. Mackay, LL. D. F. R. C. S.

This work is not mainly a system of mnemonics. It is a compilation of scientific and historical facts, admirably classified, and is invaluable as a book of reference. We cannot give a better idea of the book than by quoting from the History of Ancient Egypt, a section devoted to the Great Pyramid of Jeezeh:

GENERAL CONSTRUCTION AND FORM OF THE MONUMENT.

Art. 1.—Its materials:

A. The coffer is of hardest and toughest granite, and not intended for a dead body, as in other pyramids.

B. Internal passages and the so-called queen's chamber, of

white mokattam limestone, carefully selected for parts exposed to wear; joints wonderfully close; king's or coffer chamber of red granite.

C. Internal mass, not of rubbish like many other massive structures, but of well-cut blocks, cemented; these and the foundation rock are of nummulitic limestone, completely pervaded with fossil tokens of organic life.

D. Externally of white mokattam limestone, of remarkable finish originally; it probably surpasses any building material since selected by man. Any exposed surface of it generates spontaneously, by the action of the weather, an efficient protecting coat of a buff tint.

E. The cement of the fine joints is of astonishing tenacity.
Art. 2.—The correctness and discretion shown in its workmanship:

There is abundant precision wherever it is important for scientific data, etc., but a utilitarian economy of such workmanship, in proportion as it can be dispensed with, having regard to the meaning of the parts, and the securing of durability; while parts not to be metrically reckoned are made ostentatiously rough.

Art. 3.—Its metric standard:

A. For parts cosmically and symbolically significant, is the sacred cubit 25.025 British inches, exactly one ten-millionth of earth's polar radius—the only natural standard of both unique and extreme precision; a standard of divine origination, primeval, and preserved in the least disturbed line of Abraham's family, the Arabs, to the present day.

B. Other parts of the structure, not significant, are made in terms of quite another unit, of different origin—the earliest Gentile cubit, 20.700 British inches, called the cubit of Memphis, popularly confused with the above named.

C. National standards in general have originated in one or other of these by various divisions. Organic objects, as foot, arm, cane, reed, approximating in length, were the usual origin of the national names of the later derived standards, but not of the dimensions of those later standards.

Art. 8.—The courses of masonry:

A. Level throughout, like horizontal strata, not dipping in-

wards, square, with external face in the more proper way for security; a special reason is perceptible: As it is built, every external stone of its now ruined surface shows the original slope, and therefore height or radius of construction and the π ratio of base—the roots, in short, of the structure's references and meanings.

B. Partly for the same important reason the blocks of the core of the structure were set off, accurately in the long run, to the same slope as the batter of the finished casing was to be.

C. There are indications that the horizontal joints of some important courses divided the direct slope or measurement up the face, in terms of the sacred cubit as a unit.

Art. 9.—Their numbers :

The twenty-fifth course is the level of the so-called queen's chamber; the fiftieth course, that of the king's chamber; the two hundred and ninth course completed the Pyramid, and shows the number of pyramid degrees subtended by all the courses, from the axis at the level where the entrance passage intersects the east and west vertical mid-section plane.

Art. 10.—The vertical axis is unintercepted :

All the chambers, passages, etc., are made so as to manifest that they were to avoid interrupting the axis.

Art. 11.—The dominant number throughout the Pyramid is five :

Subordinately, five is associated with ten.

Less specially, three in connection with seven; and nine with ten.

Each have symbolic meanings determining their occurrence and domination.

I will give further extracts from this book in subsequent numbers. The Mnemonic system is as follows: The consonants of the English alphabet are employed to express numbers; the five vowels are disregarded, and the half vowels, W, Y, are used to denote the cipher O and the letter X. $BC = 1$, $DF = 2$, $CH = 3$, $JKS = 4$, $L = 5$, $MN = 6$, $PGZ = 7$, $R = 8$, $TV = 9$. To remember any fact in science, or event in history, a short sentence is formed bearing on the fact or event, in such a way that the first consonants of the several

words shall express the figures or numerals in the number we desire to remember.

Example—Babylon founded by Nimrod, 2534.

Mnemonic sentence—*A famous lawless hunter established it.*
Thus *F* stands for 2, *L* for 5, *H* for 3, and *S* for 4 = 2534.

Example 2—Suphis (Cheops,) aided by Philites, a shepherd prince, builds the Great Pyramid at Jeezeh, 2170.

Mnemonic sentence—*Its founder characterized by profound wisdom.*

Example 3—Battle of Bunker's Hill, 1775.

Sentence—*Colonial patriots purchase their laurels.*

We heartily commend this book to the attention of our readers. It has received the highest encomiums from reviewers and principals of schools. It is published by William Blackwood & Sons, Edinburgh and Scotland.

THE ATONEMENT FOR SIN AND SICKNESS. By Captain R. Kelso Carter, of the Pennsylvania Military Academy.

This book presents a clear Scriptural argument, fortified by hundreds of texts from Genesis to Revelation, to show that Jesus Christ is the same wonderful Healer to-day that He was eighteen hundred years ago; and that He heals bodies, as well as souls, by virtue of His perfect sacrifice on Calvary.

All the objections to faith-healing that have appeared in modern times are duly considered in the light of Scripture. Every case in the Bible is fully discussed, as, for example: Trophimus, Timothy, Hezekiah, Paul, etc., and each shown to be in perfect accord with the work of the Great Physician. And every difficulty in the way of those seeking healing through faith is thoroughly treated.

'THE WORD, THE WORLD, THE BRANCH.' BY J. LEYLAND FEILDEN, ESQ., Author of 'Links in the Chain of Evidence Connecting Israel and England'; 'The Gentiles and the Times of the Gentiles'; 'Israel's Jubilee, or 1882'; 'Israel Ubiquitous'; Etc., Etc.

This work opens up a new field in the consideration of chronology, and an entirely novel method of treating it.

Our world (7,200 years) is divided into 7 days. Each day contains 1,028 years, 205 days, 8 hours and *nearly* 7 minutes. It is also divided into 12 cycles of 600 years each. It is further divided into 7 parts of 1,000 years each, and a remaining part of 200 years after the millenium.

But the author alleges that our world, or the creation of Adam, began with the 43,196th year of the world. Just at the very close of the sixth day we arrive at the creation of the second Adam, the progenitor of those races now living. The year 43,200 *Anno mundi* immediately precedes *Anno Lucis*, or year of light, 1, when Adam's eyes were opened, and with the first promise of a Saviour; 43,200 A. M. dates from the fall, not the creation of our Adam. Our era commences from 43,201.

Our author claims that the whole dispensation to the fiery deluge contains 84 cycles of 600, or 50,400 years.

He claims that there were pre-Adamite races which were destroyed—in this, of course, he does not claim to be original. We have no difficulty in agreeing with him upon the first part of this. In fact, it is difficult to see how it can be possible that the races now existing, which have *no mythology, no history, no Bible, no knowledge of the great flood*, can have anything to do with, or be descended from the Noachian family. That all were and are to be blessed through the advent of the son of Isis or Eve there can be no doubt.

Our author divides the period of air and fire, the first day, into 12 cycles of 600=7,200 years.

The period of water, or second day, into 12 cycles of 600 years, or 7,200 years, which brings us to 14,400 years.

The period of earth, or third day, into 12 cycles of 600 years=7,200, which brings us to the year 21,600.

The period of transition of mineral to vegetable formation, or fourth day, 12 cycles of 600, or 7,200 years, which brings us to the year 28,800.

The period of reptile, fowl, and fish formed from water, the fifth day, 12 cycles of 600 years, or 7,200 years, which brings us to the year 36,000.

The period of man, sixth day, living creatures and men and

women created—Gen. i, 24, 31, 12 cycles of 600 years= 7,200 years. Glacial period, Eden prepared, Adam and Eve created. Fall.

Which brings us to 43,000 years from the beginning.

Concerning the creation of the second Adam, our author remarks that the second chapter of Genesis contains the history of the creation of this Adam, who is placed in Eden, specially prepared out of an otherwise cold, ice-covered and uninhabitable globe. The birds of the creation are formed out of earth, and *subsequent* to the creation of Adam himself. The previous men and women, as we have seen, were created after birds, and the birds of that era were created from water—.

“It is worthy of note that man is mentioned in Genesis ii, 5, and though there had been the previous watery creation, it never *rained*, and there was not a man to till the ground.”

The author, from his work, will be known as a full believer in the theory that the Anglo-Saxon people are the direct descendants of the lost tribes of Israel. He claims to be of the tribe of Reuben himself, avows that the day of inspiration is not past, and that God reveals himself to the humble seeker after truth and opens the eyes of his mind. He believes that in like manner as the Son of Man ascended into the clouds of heaven, so will he again come to reign upon a redeemed earth.

Mr. Feilden is now a member of our Institute, devoted to its objects heart and soul. We ask our members to give all of his works a hearing, and although they may not agree with all the theories presented, yet they will find golden thought, rich facts, and many deeply valuable and interesting things.

His books are published by Robert Banks, Racquet Court, Fleet Street, London.

NOTES AND QUERIES.

Apropos of the recent discussion on the relation between measures of length and musical tones, I would like to have it examined whether the eight feet organ-pipe, for C major, may not be taken at Pyramid cubits = 100 Pyramid inches, to give the natural tone—the “concert pitch” being recognized as slightly high?

J. M. C.

Please state to me, as near as known, how much too great the semi-diameter of the earth is, to accord with Pyramid requirements. I have long maintained that the great monument of Gizeh was a prediluvian one, and, if so, its basic measurements must accord with a diameter less than that now obtaining by about 900 feet. I am prepared to prove that the present diameter of the earth is from 70 to 80 fathoms longer, or greater than it was before the deluge, and if the Pyramid requires that much it becomes overwhelming proof of the truth of the “Annular Theory” from a source I had not expected.

I. N. V.

CIRCULAR TO THE COMMITTEE ON WEIGHTS AND MEASURES.

Dear Sir:—The following gentlemen constitute the Committee of the International Institute on Weights and Measures for the current year :

PROF. C. PIAZZI SMYTH, ASTRONOMER ROYAL.....	Time Metrology.
J. R. SKINNER, C. E.....	Hebrew Metrology, Practical and Prophetic.
J. E. HILGARD, U. S. COAST SURVEY..	The Measure of Gravity, or Weight Metrology.
PROF. N. B. WOOD	The Metrology of Chemistry, including Crystalizations.
PROF. ALFRED TAYLOR.....	The History of Metrology.
SAMUEL BESWICK, C. E.....	The Metrology of Coins or Values.
CHARLES LATIMER, C. E.....	Spherical Metrology, including Navigation.
JACOB. M. CLARK, C. E.....	Linear Metrology, including Itineraries.
LIEUT. C. A. L. TOTTEN..	Cubic Metrology, including the Measure of Liquids and Solids.
W. H. SEARLES, C. E.....	Surface Metrology.
S. F. GATES.....	Metrology in Mechanical Industries.
J. K. HORNISH.....	The Symbolism of Metrology.
PROF. STOCKWELL.....	Circular Metrology.
PROF. ROGERS.....	The Metrology of Heat, Light and Sound.
COL. CHESTER.....	The Metrology of Electricity and Magnetism.

The object of the committee is an investigation of these several departments of metrology, with a view to determine the simplest, most practicable, accurate and harmonious system of weights and measures. As each department may or may not have a *unit* of measure peculiar to itself, you are requested to make the following points a matter of special inquiry :

- 1st. The best unit of weight or measure for the department assigned you, including a complete and accurate definition.
- 2d. Its best divisions or multiples for use.
- 3d. Its relation to ancient and modern systems of metrology.
- 4th. The facility with which a practical test of its correctness may be made and its correlation with Anglo-Saxon metrology may be established.

While these suggestions are made to indicate the scope of the committee's work, it is not desirable that any member of the committee should feel restricted to these four points. The papers of the committee are to be published in *THE INTERNATIONAL STANDARD*, and the hope is entertained that they will add greatly to the value and interest of the current volume. The committee on publication desire that each paper may not exceed five pages of the *STANDARD*.

H. G. WOOD, *Chairman*.

INTERNATIONAL INSTITUTE OF
ANGLO-SAXON METROLOGY.

Cleveland, O., January 17, 1885.

ERRATA.

INTERNATIONAL STANDARD, NOVEMBER, 1884.

ARTICLE SPHINX.

Page 483—Line 4 from below, *read* "and to be a monument."

Page 484—Line 18 from top, *read* "plain at the base."

Page 488—Line 10 from top, *read* "Hor-em Khou."

Page 490—Line 13 from top, *read* "Hor-em Khou."

Page 491—Line 2 from top, *read* "Hor-em Khou."

Page 490—Line 6 from below, *read* "be represented."

Page 491—Line 16 from below, *read* "of Esnè."

Page 491—Line 13 from below, *read* "species with."

Page 492—Line 2 from top, *read* "See Mazzaroth."

Page 492—Line 13 from top, *read* "Grattan."

Page 492—Line 12 from below, *read* "by the stars Al Debaran."

Page 492—Line 11 from below, *read* "Fom-al-haut."

Page 492—Line 6 from below, *read* "called Criobilium."

Page 493—Line 21 from below, *read* "Aquarius is pouring from a vase two," etc.

Page 493—Line 9 from below, *read* "Sun of righteousness."

Page 494—Line 2 from top, *read* "decans."

Page 494—Line 4 from top, *read* "Ara."

Page 494—Line 4 from top, *read* "Eagle."

ARTICLE "UNVEILING OF ISIS"—NOVEMBER, 1884.

A quotation from the work of Rev. Jesse H. Jones, "The Kingdom of Heaven, what it is, where it is and the duty of American Christians concerning it," begins on page 541, 7th line from top, and concludes the article on page 542. By the omission of the quotation marks at the close, the grand language of Mr. Jones is thus apparently credited to Charles Latimer.

“UNVEILING OF ISIS”—JANUARY, 1885.

The opening sentence, “The United States of America is the Kingdom of Heaven which Jesus Christ came to Establish upon the Earth,” should be credited to Rev. Jesse H. Jones.

Page 569—Line 2 from below, for Rodgers *read* Rogers.

Page 575—Line 9 from below, for slandered *read* abandoned country.

Page 577—Line 11 from top, for Galeani *read* Galiani.

Page 577—Line 13 from below, for Cerisiet *read* Cerisier.

Page 578—Line 13 from top, for Michigan *read* Nicaragua.

SEPTEMBER, 1884.

NOTICE OF ROBERT MENZIES.

Page 437—For “Leeds” *read* Leith.

NOVEMBER, 1884.

CHARLES CASEY'S SOLUTION OF THE MEANING OF THE “UNINTERPRETED SIGN.”

Page 550—7th line from top, for “Arid” *read* Avid.

Page 551—3d line from below, for “Muir” *read* Menzies.

NOTE.—The illustration intended for the frontispiece of the Magazine did not arrive in time to appear in this number. [EDITOR.]

