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

GREAT PYRAMID OF JEEZEH IN EGYPT

JULY, 1883

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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.

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THE HISTORY OF THE GREAT PYRAMID.

Could some one who is convenient to libraries, and knows just where to look, give us all the mentions of the Great Pyramid down to modern times, and the references, it would be of special service to students of that building. Though we are far from being able to do this, we can make a beginning, and thus open the way for others.

The first mention of the Great Pyramid, in such written history as we now possess, except some possible allusions in the Bible, is the account given by Herodotus, the Greek, whose date is 484–408 B.C.; and who is called the Father of History, because he is the first secular historian whose writings have come down to us. This painstaking traveler, and accurate recorder of what he was told, stood before the building, saw the inscription over the entrance, conversed through a Greek interpreter with the Egyptian priests, and has given us the stories which that interpreter told to him. Some of these stories are evidently unmitigated yarns which the interpreter or the priests palmed off upon a foreigner whom they could not appreciate, and who was not of sufficiently critical mind to discriminate between the monstrous absurdities which they soberly told him for real history, and the genuine facts. Nevertheless, he has preserved for us some of the chief and most important

of these facts. We have only to remember that he wrote more than seventeen hundred years at the least (Mr. Proctor would make it three thousand) after the Great Pyramid was finished, and that every word about it written before him is lost; and that in his record is found the only clue we have to explain how or by whom it was planned, and the building of it secured, to enable us to realize how priceless that record is. We now give what he wrote, except one worse than worthless story, and afterwards will show what has been made out therefrom:

"Till the death of Rhampsinitus, the priests said, Egypt was excellently governed, and flourished greatly; but after him Cheops succeeded to the throne, and plunged into all manner of wickedness. He closed the temples, and forbade the Egyptians to offer sacrifice, compelling them instead to labor, one and all, in his service. Some were required to drag blocks of stone down to the Nile from the quarries in the Arabian range of hills; others received the blocks after they had been conveyed in boats across the river, and drew them to the range of hills called the Lybian. A hundred thousand men labored constantly, and were relieved every three months by a fresh lot. It took ten years' oppression of the people to make the causeway for the conveyance of the stones, a work not much inferior, in my judgment, to the pyramid itself. This causeway is five furlongs in length, ten fathoms wide, and in height, at the highest part, eight fathoms. It is built of polished stone, and is covered with carvings of animals. To make it took ten years, as I said—or rather to make the causeway, the works on the mound where the pyramid stands, and the underground chambers, which Cheops intended as vaults for his own use; these last were built on a sort of island, surrounded by water introduced from the Nile by a canal. The pyramid itself was twenty years in building. It is a square, eight hundred feet each way, and the height the same, built entirely of polished stone, fitted together with the utmost care. The stones of which it is composed are none of them less than thirty feet in length.

"The pyramid was built in steps, battlement-wise, as it is called, or, according to others, altar-wise. After laying the

stones for the base, they raised the remaining stones to their places by means of machines formed of short wooden planks. The first machine raised them from the ground to the top of the first step. On this there was another machine, which received the stone upon its arrival, and conveyed it to the second step, whence a third machine advanced it still higher. Either they had as many machines as there were steps in the pyramid or possibly they had but a single machine, which, being easily moved, was transferred from tier to tier as the stone rose—both accounts are given, and therefore I mention both. The upper portion of the pyramid was finished first, then the middle, and finally the part which was lowest and nearest the ground. There is an inscription in Egyptian characters on the pyramid which records the quantity of radishes, onions, and garlics consumed by the laborers who constructed it; and I perfectly well remember that the interpreter who read the writing to me said that the money expended in this way was 1,600 talents of silver. If this, then, is a true record what a vast sum must have been spent on the iron tools used in this work, and on the feeding and clothing of the laborers, considering the length of time the work lasted, which has already been stated; and the additional time—no small space, I imagine—which must have been occupied by the quarrying of the stones, their conveyance, and the formation of the underground apartments.

"Cheops reigned, the Egyptians said, fifty years, and was succeeded at his demise by Chephren, his brother. Chephren imitated the conduct of his predecessor, and, like him, built a pyramid, which did not, however, equal the dimensions of his brother's. Of this I am certain, for I measured them both myself. It has no subterraneous apartments, nor any canal from the Nile to supply it with water, as the other pyramid has. In that, the Nile water, introduced through an artificial duct, surrounds an island, where the body of Cheops is said to lie. Chephren built his pyramid close to the great pyramid of Cheops, and of the same dimensions, except that he lowered the height forty feet. For the basement he employed the many colored stone of Ethiopia. These two pyramids stand

both on the same hill, an elevation not far short of a hundred feet in height. The reign of Chephren lasted fifty-six years. Thus the affliction of Egypt endured for the space of one hundred and six years, during the whole of which time the temples were shut up and never opened. The Egyptians so detest the memory of these kings that they do not much like even to mention their names. Hence they commonly call the pyramids after Philition, a shepherd who at that time fed his flocks about the place."—*Rawlinson's Herodotus, English Edn., pp. 169-176.*

By putting together what the pyramid itself and Herodotus give us, a general consent to the following conclusions has been reached:

1. The Great Pyramid was planned and the building of it directed by men of an entirely different religion from that of the Egyptians, and one strongly hostile thereto. This is why they shut up the temples and made all the rites pertaining to them to cease.

2. This foreign and controlling religion was as pure as the highest ideal of the Old Testament, so far as abstaining from idol worship is concerned. This is shown by the fact that not a sign of any image appears throughout the pyramid—a fact in such marked contrast with the picturing of all sorts of animal-headed gods on all truly Egyptian buildings, as to be deemed conclusive. This explains why the Egyptians "detested" the kings so who yielded to these foreigners and obeyed them; and considered their rule an "affliction," and disliked even "to mention their names." This view is that of the priests of the animal-headed gods, whose temples were thus shut up, and shows their natural feeling.

3. These foreigners were shepherds and came from the east. The last sentence of Herodotus seems unintelligible on any other grounds, but on this is plain; and we believe no one questions the interpretation. And that they must have come from the east all agree, for there was no where else for them to have come from.

4. These foreigners must have been Arabians, or Chaldeans; with the probabilities greatly in favor of the former; but in any case the science which either possessed was held by both in

common. No one can have read Le Normant and Chevallier's Ancient History, The Arabians, Book vii (and their work is of the highest authority), without feeling that long ages ago, and contemporary with the earlier Egypt, there arose in the half desert peninsula of Arabia a civilization of a high order, the record of which is now almost obliterated. And when we recall that our figures, 1, 2, 3, etc., are called *Arabic* numerals, because, as we are taught, they came from Arabia, this single fact lights up as with a blazing torch the whole scene. Imagine that those Arab shepherds had the same genius for mathematics and astronomy as the Israelites had for religion, and that their genius for religion was fairly coördinate and almost coequal with that for those sciences, and the whole matter is explained. And the history of the Arabs to this day strongly confirms this view, which we believe to be the true one. All that the Arabs knew the Chaldeans knew, and *vice versa*; but the dwelling place of the former so contiguous to Egypt and so related by the currents of commerce in that time, renders it altogether likely that they were the mysterious shepherds who swayed the kings of Egypt in the building of the first pyramids.

5. The means by which these foreigners gained control of the Egyptian kings were not military—this the priests themselves declared or implied—but were mysterious, and must have been religious and astronomical. The Great Pyramid is now conceded to be, we judge, without question, by any who have studied the matter, the most astronomical building on the globe of which we have knowledge. This shows the astronomical influence. The fact that architects prevailed on the kings to close the temples of Egypt shows the religious element, for they certainly would not have closed them without the strongest religious influence; and that they were required to close them shows that that influence was entirely opposed to their animal-headed gods. The Arabs have never worshipped idols, not from the earliest times, but rather the *stars*; and the very name Sabean, which is applied to star-worship, is Arabian. The men who controlled in the building of the Great Pyramid were clearly, according to all the evidence, men of what may well be called an astronomical religion, and this fact gives strong color

to Mr. Proctor's views of the astrological element in the control of the Egyptian kings,—a view which we incline to accept as a part of the whole fact.

6. Another point we do not remember to have seen mentioned—Herodotus says it was built "battlement-wise," *i. e.*, "by steps," according to some, and "altar-wise," according to others. Both seem to us true. It was certainly built by steps for that we know from the building itself, and no one can have seen Mr. Proctor's pictures of the look of it when finished to the fiftieth tier, the level of the king's chamber, while remembering that astronomer *priests* were its architects, without seeing how it was "*altar*-wise."

7. Perhaps in nothing in the interpretation of Herodotus have more keenness and penetration been shown than in discerning from his words what was the real nature of the inscription over the entrance. No serious person, when once he thinks of it, will quite believe that men of such intellectual ability as to be able to devise the plan of the Great Pyramid, could have had no more sense than to put as their only inscription upon it "the number of radishes, onions, and garlics" eaten by the workmen. The story is too absurd. But if we change the order of the words a little, and read onions, radishes, and garlics, and bear in mind that onions are round, radishes long and tapering, and garlics two-pronged, long and tapering, then this is what comes: that what he called onions was the round circle which stands for degrees, what he called radishes was the single mark for minutes, and what he called garlics was the double mark for seconds; and that the record was of that angle of arc which the architects deemed the key-note or clue to their whole work, whether it was the angle of the descending passage or some other; and he being as ignorant as a child is of Arabic of what the nature of the record really was, probably not even knowing of the existence of any science corresponding to those signs, took the yarn of the bamboozling priest for solid fact.

We have given much space to Herodotus, because he contains more information than all other writers of antiquity, which have come down to us, combined. JESSE JONES.

DESCRIPTION AND MEANING OF THE DESIGN ON THE COVER.

Preparatory to the presentation of many remarkable and startling truths connected with ancient mythology, showing that its interpretation is in the pursuit of Divine Wisdom, and not to be understood by accepting the absurd vagaries of pagan writers and fanciful poets, it becomes our duty and is our firm intention to show the intimate relation of the subject to the Anglo-Saxon weights and measures, through which we obtain a clue whereby we may unravel the mystery connected with the children of Eve, *i. e.* "Isis." We, therefore, give here an introductory description of the cover of the magazine upon which we have lifted our ensign; as saith the prophet: "And he shall set up an ensign for the nations, and shall assemble the outcasts of Israel, and gather together the dispersed of Judah from the four corners of the earth."—Isaiah XI, 12.

The central figure is what is commonly called Justice, and in it is one of the most ancient of the symbols of that wondrous home of the arts and sciences—Egypt. It represents the constellation of the Virgin, or the Egyptian Isis (sometimes Nemesis) as the guardian of the scales or libra, meaning *pound.* In her right hand she holds the measuring rod of twenty-five parts or inches, or the cubit with scales attached—a symbol of libra. As Ariadne, the same rod symbolizes the thread by which we are enabled through its measures to find our way back in the labyrinth of the past, to unlock the secrets of the temple of Isis. Her left hand points to the book containing the history of her generations, and Divine Wisdom, opened at that page whereon is written "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 giveth thee."

The book is held in the right hand of the god Bacchus, not the god of license, but the god of liberty whose name is Liber, free—free book—that god who placed in the heavens the crown at the head of the page—Ariadne's crown, Isis' or Virgo's crown, whose day is celebrated on November 11th,

advent day. In the left hand of the god is the lotus flower—symbol of generation of Divine Wisdom, and a symbol of the new order of ages begun—a new birth—liberty, an offering to the Virgin of the sphere.

The five pointed star, sacred to Isis, is above her head—an emblem of the flower of Egypt, a symbol of Divine Wisdom contained in the pyramid. The rays of the sun are shining down, clothing her, and under her feet is the crescent, and above her head a crown of twelve stars, a symbol, the most ancient in the mythology of Egypt—representing the labarum, banner, or standard of Isis, the truest and most perfect representation of an International Standard, grouping together the children of Eve. She stands a representative of the archtypal figure, six feet, or one fathom in height, with stretch the same fathom or orgia; if with arms extended, each arm the brazo or cubit of 25 inches. She stands upon a pedestal the proportion of which is from center beneath the cap to the extremities above pavement, that of the architecture of the mathematici, the geometrici or sons of light.

The cap upon which she stands is supported by the arms of Great Britain and the United States, whilst in the center is a representation of the reverse of the great seal of the United States in a circle representing a pyramid unfinished, in the zenith a radiant triangle with the all-seeing eye of Providence in the center, whilst above are the words: *Annuit Cæptis*, "He hath favored our undertakings;" and below: *Novus Ordo Seclorum*, "New order of ages;" and the date of the Declaration of Independence on the base of the pyramid—1776.

Below the pyramid is the Sphnix, for between the fore paws of this was the temple of Isis, in which it is supposed the oath was administered to preserve the calendar and the weights and measures. This does not belong to the seal.

Upon the basement of the pedestal is seen the coffer, as contained in the King's Chamber, with the figures 3.14159 + or π, which is the proportion of the diameter to the circumference of a circle, and which is the proportion upon which the Great Pyramid of Jeezeh is built—that is, its height is to twice the one base side as 1 is to π, or in other words, the circum-

ference of the circle described with the height of the pyramid is equal to the four sides of the base.

Below the base are three keys with which the secrets of the altar can be unlocked, the secrets which the priests of On or the Lord in Egypt required their kings to swear upon the altar of Isis to preserve with the calendar and weights and measures, viz: 1st, the key of pure mathematics, π, or the value of the circumference of a circle in terms of its diameter; 2nd, the key of applied mathematics, or of astronomical and physical science; 3rd, "the key of positive human history—past, present and future—as (supplied) in some of its leading points, and chief religious connections by Divine revelation to certain chosen and inspired men of the Hebrew race, through ancient and mediæval times, but now to be found by all the world collected in the Old and New Testament." *

The keys depend upon the circle, in the center of which are the twelve signs of the zodiac—for it is written "The heavens declare the glory of God, and the earth showeth His handiwork."

In the upper right hand corner we have the western hemisphere with polar diameter looking through, and the meridian *passing through* Boston, Mass.; and the photograph of the position of the heavens at the moment of the organization of the International Institute for Preserving and Perfecting the Anglo-Saxon Weights and Measures, in the old South Church, Boston, at mean noon, November 8th, civil time, 1879, when the principal star of Ariadne, Isis' or Virgo's crown was on the meridian, and the principal star of Libra was also on the meridian, and the sun clothed that constellation.

On the upper left corner we have the eastern hemisphere, one inch diameter, passing through the Great Pyramid of Jeezeh.

The whole cover is of the proportion of the pyramid, the width being, when trimmed, one-thousandth of the height, or 5.81862287; and the length one-thousandth of the base, or 9.136871258 in British inches; or in other words, about six inches wide and nine inches long, which is found now to be the proportion of many magazines.

The general symbol is cosmical; it takes in the universe;

* Piazzi Smith, Astronomer Royal for Scotland.

but the chief supporters of the standards of our race are the Anglo-Saxons. As the nations come back to the oath made long ago on the altar of Isis, their arms will be added to this design. The whole symbol is an epitome of our work and an inquiry into the origin of language, nations, and religions, through weights and measures as related to the cosmos.

CHARLES LATIMER.

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*A PREFACE BY M. L'ABBÉ MOIGNO

TO A WORK ENTITLED "LA CAMPAGNE DE MOISE," BY M. LECOINTRE.

It is a wonderful and interesting fact that the attention of the scientific men of all nations is being drawn towards the land of Egypt and the Great Pyramid of Jeezeh. In addition to the works of the great men with which we are familiar, there have come to us within the past few weeks—in fact since our last meeting—a new book on the pyramids by Mr. Ballard, an English engineer, residing in Australia, and another upon the Campaign of Moses in the Exodus from Egypt, by Monsieur Lecointre, a French engineer, with a preface by the celebrated Abbé Moigno. This preface is so interesting that I cannot refrain from giving you a translation of a portion of it.

After giving the Biblical account of the departure of the Israelites from Egypt under the generalship of Moses, of their safe passage through the Red Sea, and the entire destruction of Pharaoh and his army, and the sublime canticle sung by Moses and the children of Israel when, by the glorious manifestation of God's power, they found themselves safe from their enemies he says:

"Thus glorified by Moses, the grand fact of the passage of the Red sea has been told again from time to time by all of the sacred writers—Joshua, Esdras, Judith, Job, David, Solomon, Isaiah, Jeremiah, Habakkuk, the author of the book of Maccabees, St. Luke and St. Paul. Never has there been seen a grander and more living tradition than this, in the hearts of a

*Translated by Mrs. Emily Lewis.

great people, who still exist, dispersed, but visible among all the nations of the world.

"And yet they have endeavored to reduce to common proportions this grand fact, of which the illustrious traveler, Bruce, has said: 'The passage of the Red sea is told us in the Holy Scriptures as a miraculous fact, and there is no reason why we should seek natural causes.'

"Spinosa says, 'That the passage of the Red sea was the effect of a violent wind which blew all night.' This is a purely gratuitous assertion. Moses caused the wind to blow but it was only to dry up the slimy bottom of the sea. Moreover, the wind, so propitious to the children of Israel, so fatal to the Egyptians, could have easily been employed as the instrument of the miracle.

"Many ancient authors have pretended that the Hebrews did not really cross the Red sea, and the proof which they pretend to give is that the sacred text speaks of Etham before and after their entrance into the Red sea. But they forget that the word Etham is a generic word, meaning a dry and sandy desert, and that all the vast solitude extending from the east and west of the Arabic gulf to the Red sea was called Etham.

"To the eyes of Monsieur Salvador the passage of the Red sea was a very prosaic event. A low tide permitted the crossing of the Hebrews, the reflux tide swallowed up the Egyptians. It is thus reduced to the experience of a camel driver and to the stupidity of a general who led his men through at the reflux of the tide. This, too, is a gratuitous supposition, incompatible with the distinct and precise language of the Bible. The ebb and flow of the tide could never have made two walls of heaped up waters—a sea divided in two, between which they entered and from which they went out.

"Other critics say that Moses, who had lived many years in the land of Midian, and was familiar with the banks of the Red sea, led the entire multitude of the Hebrews to a ford which he knew from experience. This account is not less incompatible with the recital of Moses. To go through a ford is not to march on foot between two walls of water.

"Professor Richard Owen has said that the isthmus of Suez,

which unites the Red sea to the Mediterranean has come up or been formed since those times, and that in historic days the two seas have never been in communication. He gives for proof an assertion of his own, that there exists no species of marine animals common to the two seas, thus ignoring the fact that one of his most learned compatriots, Mr. Woodward, has enumerated more than fifty species of fish and mollusks common to the Mediterranean and the Red seas, but here is the declaration which Monsieur De Lesseps, the faithful and learned reporter of all of the engineers of the Suez canal, has solemnly made in the meeting of the Academy of Sciences on the 22d of June, 1874:

"'At the time of the departure of the Israelites from the land of Egypt under the guidance of Moses, the tide of the Red sea reached at least to the foot of Serapeum near the lake Timsah. It is not more than eleven hundred years since these bitter lakes were filled with brackish water, and they have continued at intervals of time to receive the waters of the Red sea. When they have no longer been overrun by the equinoctial tides, or even exceptional tides, banks of salt have commenced to form. To-day the whole of these banks constitute an enormous mass of 990,000 millions of kilogrammes—the result of the evaporation of 24,000 millions of metric cubes of water of the Red sea. It is then false—absolutely false that the isthmus of Suez was entirely consolidated; moreover the passage of the Red sea at the time of Moses could have been made at the north of Suez, and not necessarily to the south of the actual point of the Red sea.'

"When then was this passage really made? As we shall see presently, this question is of immense interest. Now we cannot doubt that the passage was made at a place called in the Holy Scriptures Pihahiroth—opposite Baalzephon—and the question is to know the exact position of Pihahiroth.

"R. P. Secard, a Jesuit missionary, studied the matter very carefully upon the spot—from Rameses to Etham and Pihahiroth, places in the plains of Bede, six leagues from the sea. The Hebrews would have encamped at the extreme end of this

plain—near the sources of Thonaireg; but the plain of Bede are now a desert, and the Hebrews could have entered into the desert only in coming out from the sea. Moreover, the width of the Red sea at this point is six or seven leagues, a distance which it would have been impossible to cross in seven or eight hours. In fact, according to the local geography, this theory of Monsieur Secard is much less in accord with the text of the Holy Scriptures.

"But we agree fully with the solution of this very difficult problem given by Monsieur Lecointre, a distinguished engineer of naval constructions, who has participated in the labors of the opening of the Suez canal. A very careful and minute explanation of these countries where he has sojourned in the progress of his work has led him to locate the passage of the Red sea at that point of the sea which for some time formed the bitter lakes, and to identify Pihahiroth with Chebrewet. But how could the region of the bitter lakes have been separated from the Red sea, and at what epoch?

"I have been the first to discover the full and complete solution of the second problem in the psalm concerning the exodus of Israel from Egypt, which we all have sung and recited a thousand times without comprehending the import or even the sense of it. This separation was the result of the earthquake of Sinai which occurred fifty days after the passage of the Red sea.

When Israel came out of Egypt and the house of Jacob from among the strange people, Judah was his sanctuary and Israel his dominion.

The sea saw it and fled. Jordan was driven back.

The mountains skipped like rams and the little hills like young sheep. What ailed thee, O thou sea, that thou fleddest? and thou Jordan that thou wast driven back?

"This signifies in a figurative language that a throwing up of the ground took place; on one side the entrances of Chalons and of Serapeum in making the Red sea to flow back, separating it from the bitter lakes, on the other side the lines of the highest point of the double valley of Akabah and of Arabah, barring the passage to the River Jordan, shutting up the opening of the sea of Elam and, forcing it to return to the Dead sea.

"This happy explanation is the natural complement and definite proof of the beautiful discovery of Monsieur De Lecointre.

"This skillful engineer gave for the first time his views on this Campaign of Moses in a little pamphlet, which I analyzed at length, including it in the third volume of my 'Splendors of the Faith.' This theory of Monsieur Lecointre was then very little discussed, but since that time many Christian Apologists —R. P. Pufol, of the Society of Jesus, Monsieur L'Abbé Vigouroux, director at St. Sulpice, and others,—opposed this happy solution of the grand problem given by my friend, by presenting other theories, other views. M. Lecointre was thus brought to retouch his work, to present it under a new and much more complete form, and even to discuss with their authors, particularly with the Abbè Vigouroux, the objections which they offered to his theory. From these new studies, these serious discussions, is born the little volume of The Campaign of Moses in the Exodus from Egypt, which I am happy to publish, with a grand scheme which it remains for me to explain.

"Since, thanks to the researches of modern science, and to the gigantic labors of the opening of the Suez canal, the place of the passage of the Red sea is indicated in a certain manner, has not the moment come to invite the entire Christian world to a noble and holy enterprise? to provide the necessary funds for making researches, which have for their aim to bring forth the solemn remains of the Egyptian army swallowed up in the Red sea, with its chariots, its horses, its arms, its treasures, its archives, and perhaps its king, the Pharaoh vanquished by Moses?

"This discovery would evidently be a magnificent splendor of the faith which Christians would be happy to achieve at the price of even great sacrifices.

"Shut up in the salt heaps of the bitter lakes, sheltered at least at many points by the salt beds of sufficient thickness, these historical remains are perhaps in a state of unexpected preservation.

"I estimate that the expenses of these researches would be three hundred thousand francs, or $60,000. It is for this sum that it is necessary to open a subscription—but the amount subcribed would be paid only in fourths. These funds would

carry no interest, but the sale of the results of these researches would bring profit enough to cover largely the capital subscribed and to give even a handsome bonus to the subscribers. The explorations of Troy and Olympus have made the fortune and the glory of him who has undertaken them. They have put him in possession of treasures, even materials of very great value. Why would it not be the same, and in a far greater proportion, from the excavations of the ancient bed of the Red sea? This concerns an entire army. If the utensils which shall be found there are not of precious metal, the archæological documents accompanying them will have perhaps a very great value.

"If the proper time had arrived—if the revolution were not too triumphant, I would open to-day in the bureau of Cosmos-les-mondes the subscription for the exploration of the bitter lakes opposite Chebrewet. I would place it under the administrative patronage of a commission, to which I hope would condescend to join themselves M. De Lesseps, De Rougé, Le Normand, Robiou, Maspero, and others. It would be for this commission to choose a director of this undertaking. I would like to propose to-day Monsieur Victor Guérin, the glorious historian of the Holy Land, who has done more by himself than all the English jointly for the exploration of Palestine.

"The army of Pharaoh brought to light and proclaiming by its presence the power of Moses, the absolute truth of the Holy Bible—what hosannas! How blessed will be the day when success shall have crowned my novel suggestion.

"This will not be my first triumph. I at one time suggested to the Abbé Richard, the celebrated geologist, who, alas, has just died, that he should go to Gilgal upon the borders of Jordan and search in the tomb of Joseph for the stone knives of the circumcision. He went there—he found the knives by thousands, and returned rich with an incomparable collection of silex cuttings—older, I have proved beyond a doubt, than the silex cuttings of Saint Acheul of the Eysies—of Monstiers, of Solutré, and which settles, in an unexpected manner, the great question of the néo-antiquity of man.

"Dare I to say that I aspire to a third triumph? I would have

them connect with the excavations of the ancient bed of the Red sea, and that it should be comprised in the same subscription, the search for the aerolites fallen from heaven, the evening of the famous battle gained by Joshua, meteors which covered the earth from Bethoron to Azeca and which crushed more Philistines than had been killed by the sword, embedded, without doubt, at a depth of some metres; they could be found without trouble, and they in their turn would be sure of the splendors of the faith, and at the same time their purchase by museums and amateurs would cover largely the expenses of the excavations.

"I finish with a last wish—the Great Pyramid of Jeezeh, as everyone knows, is the object of my most profound admiration, I would say almost of my pious veneration, because of the treasures of ancient and modern science which it has already revealed to the astonished world.

"I desire that it should become an international monument; placed under the protection of all Christian nations, who shall restore it, who shall again give it its original covering of polished limestone, who shall defend it from further devastation; and for this purpose I desire that all the riches of the army of Pharaoh, which may be found, shall be gathered into a vast museum, built near the Great Pyramid, so that this museum, visited by pilgrims from all the countries of the world, should furnish in abundance the necessary resources for the investigation of this incomparable monument, which hides within its prophetic sides even the mysterious date of the last judgment and of the end of the world.

"Allow me to say in closing that however ventursome my project may appear at the first glance, it has already excited lively sympathy in Germany, in England and America. A much esteemed German newspaper, the *Odilien Blatt*, has at once referred to it in these words:

"'The very celebrated Abbé Moigno has conceived a wonderful thought: it is to make researches at the bottom of the Red sea, to discover the proofs of the event recounted by Moses,* and which took place more than three thousand years ago. If

* We are in the age when "the sea shall give up its dead."—[EDITOR.

this enterprise succeeds, its success will be one of the most incontrovertible proofs of the authenticity and veracity of the account of Moses, at the same time it would be a splendid refutation of the objections by which modern science has endeavored to show the Bible in flagrant contradiction with their new discoveries.'

"P. S.—Since I have written the above I am confirmed in the opinion that the Great Pyramid of Gizeh, constructed under the direction of Melchisedec, the great priest of God, the great astronomer, the great architect, the great mathematician, is almost certainly the monument to which Isaiah alludes in these mysterious terms, (chap. xix, 5–19): '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.' In truth, the most experienced eye can discover nothing either pagan or idolatrous in the Great Pyramid of Gizeh.

"I would add that after having translated the grand book of Piazzi Smith, royal astronomer of Scotland, Our Inheritance in the Great Pyramid of Gizeh, I have requested that it should be examined in Rome, and the examiner, R. P. Torquato Armellini, has answered by a *nihil obstat*, which has delighted me inexpressibly.

"The issuing of this volume, which I shall entitle the Splendor of Splendors, and which will be as a glorious crown of my Splendors of the Faith, will cost 7,000 francs. However adventursome I may have been thus far, I should believe to tempt the good God if I should myself make the expenses of this issue. But I have counted upon a great and generous soul who should make this advance of funds, and should this soul not appear, I shall resign myself to the opening of a subscription list with a profound hope that it will soon be complete. This will be the prelude of the subscription for the search of the army of Pharaoh."

July 15, 1882. ABBÉ MOIGNO.

*THE GREAT PYRAMID AND THE GEOGRAPHICAL POSITION OF JERUSALEM.

It is now, I believe, generally admitted by students of the Great Pyramid that it was intended to indicate the dates of the birth and death of Christ, the duration of the Christian dispensation, the time of "the beginning of the end," and probably also the time when Jerusalem shall become the capital of the Christian world. It has, therefore, seemed to me not unreasonable to suppose that besides the dates of the birth and death of our Saviour, a careful investigation might lead to the discovery of indications of a connection by numbers and measures between the pyramid and the city in which His teachings commenced and ended; in which also the gospel was first preached by His express command, and which is destined to become the capital of a world-wide and glorious kingdom. For the complete carrying out of such an investigation it is necessary to have the exact geographical position of the Great Pyramid, and also the position and extent of Jerusalem in the time of Christ. The latitude of the pyramid was very accurately determined by Professor Piazzi Smyth; but I am not aware that any accurate determination of its longitude has ever been made. The position and extent of Jerusalem, as given by different authorities, exhibit differences which I was not prepared to expect with so important a city; but it may be regarded as being within the limits of 31° 46′ 10″ and 31° 47′ 50″ N. latitude, and 35° 13′ to 35° 14′ E. longitude; or, including Bethany, the scene of the ascension, within 35° 13′ and 35° 15′ east. Having in the course of my pyramid investigations noticed that the sine of the geocentric latitude of the pyramid was equal to the tangent of the angle of descent of the entrance passage; and believing that the latitude of a section of the earth parallel to the equator, and having a diameter of 7,000 pyramid miles, would be found to have some geometrical relation to the latitude of Jerusalem; and Mr. Besant, the secretary of the Palestine Ex-

*From the *Banner of Israel.*

ploration Fund, having kindly communicated to me through the editor of the *Banner*, the latitude of Jerusalem 31° 47′, I calculated the length of a radius of the earth in this latitude, and found it to be 3,955.338 pyramid miles; then multiplying this by the tangent of 27° 47′ 3.8″, the geocentric latitude of the section, or circle, having a diameter of 7,000 miles; and dividing by the length of the radius in this latter latitude, I obtained the sine of latitude 31° 47′ 19.6″, which is a close approximation to the value communicated by Mr. Besant, and coming well within the limits of the city. This result at once led to the discovery of the following additional remarkable relations, which appear to me to prove beyond all doubt or question that the architect of the pyramid knew perfectly well the exact geographical position of the site of the then future holy city, which was to become, in after ages, the scene of events of surpassing interest and importance to the whole human family; and also that the pyramid mile of 63,360 pyramid inches was a recognized measure at the time of the building of the pyramid.

As it was necessary for the purposes of the inquiry to employ geocentric instead of apparent latitudes, it may be well to explain that the apparent latitude of a place is the angle formed by a perpendicular to the horizon or the direction of the plumb line and the plane of the equator; but owing to the ellipsoidal form of the earth, a continuation of this perpendicular downwards from all points on the earth's surface, except at the poles and on the equator, does not pass through the center; but the geocentric latitude is the angle formed at the center of the earth by the plane of equator, and the radius, or line, drawn from the centre to the place of observation; and it is this latitude which must be used in all cases where extreme accuracy is required in the determination of positions and distances on the earth's surface.

2. In geocentric latitude 31° 37′ 13.3″, corresponding to apparent latitude 31° 47′ 33.5″, the radius = 3,955.338 pyramid miles, and the sine of the latitude, or the height above the plane of the equator of the part of Jerusalem corresponding to this latitude is 2,073.738 pyramid miles; the difference is, therefore, 1881.6 pyramid miles; or the number of miles is

exactly equal to the number of inches in the floor line of the grand gallery.

3. In geocentric latitude 31° 36′ 59.7″, or only 14.6″ south of the above, the cosine, or distance from Jerusalem to the polar axis is 3,368.267 pyramid miles, and the sine, or distance, to the plane of the equator is 2,073.517 pyramid miles; the difference is, therefore, 1294.750 pyramid miles; or exactly equal in inches to the length of the king's chamber, multiplied by π; or to the length of the tropical year in mean solar days multiplied by twice the square root of π.

4. Half the difference between 3,368.056, the number of pyramid miles in the cosine of a site in Jerusalem in latitude 31° 37′ 20.7″, and 2,170.192, the number of inches in the distance from the two fine lines on the sides of the entrance passage of the pyramid to the entrance into the grand gallery, multiplied by $\pi = 1881.6$.

5. The difference between the radius and cosine of latitude 31° 36′ 52.9″, multiplied by π=1,844.122 pyramid miles=height above the plane of the equator of the section of the earth, or parallel of latitude, which is 7,000 pyramid miles in diameter.

6. The difference between the length of the polar radius of the earth, 3,945.707 miles, and that of the cosine, 3,368.290, of a point in Jerusalem in latitude 31° 36′ 57.5″, multiplied by $\pi = 1,814.009$ = in inches the distance from the entrance into the grand gallery to the foot of the great step.

7. The sum of the cosines of the latitudes of Jerusalem and the pyramid, 31° 37′ 13.3″, and 29° 48′ 51.5″, divided by 3 times 10 = 226.675 = the length of the queen's chamber.

8. The diameter of a circle having an area of 7,000 × 7,000 miles is 7,898.653 miles; and deducting from this 6,736.050, the diameter of the parallel of latitude 31° 37′ 23.7″, which passes through Jerusalem, we have 1,162,603, or, in inches, ten times the length of the ante-chamber, or one-fifth of the height of the pyramid.

9. The diameter of the circle of latitude 27° 47′ 3.8″, 7,000 miles less that of latitude 31° 36′ 5.6″, which also passes through Jerusalem, 6,737.630 = 262.370, or the number of inches in twice the length of the king's chamber divided by π.

10. The diameter of the earth in the latitude of the pyramid multiplied by 9, and divided by 34.3443 = 2,073.203, or sine of latitude 31° 36′ 40.4″.

11. The sum of the diameter of the circle of latitude of 31° 36′ 0.7″, and that of latitude 27° 47′ 3.8″, multiplied by 3 and divided by 100 = 412.131857.

12. Half the sum of the diameter of the circles of latitude of 31° 36′ 0.7″, and 27° 47′ 3.8″, divided by 10, and multiplied by the tangent of 26° 18′ 10″ = 339.52 = height of the grand gallery.

13. Five times the square root of the product of the differences of the sines and the cosines of the latitudes of the pyramid and Jerusalem (29° 48′ 51.5″ and 31° 36′ 47.74″)= 412.1318.

14. Nine times the height of the king's chamber = 2,073.498 = height in miles above the plane of the equator of a point in Jerusalem in latitude 31° 36′ 58.5″.

15. The height of the center of the gable ridge of the ceiling of the queen's chamber, multiplied by twelve times the square root of 50, and divided by 10 = 2,073.803 = height above the plane of the equator of a point in Jerusalem in latitude 31° 37′ 17.2″.

16. Twice the apparent latitude of a point in Jerusalem, midway between Zion and the site of the temple (63° 33′ 11″), taken from 90° = 26° 26′ 49″ = the angle of descent of the entrance passage of the Great Pyramid, according to the mean of Professor Piazzi Smyth's measures.

17. In geocentric latitude 63° 33′ 58.65″, twice the sine is 7,071.068 miles = the side of a square having an area of 50,000,000 miles; and the apparent latitude corresponding to 63° 33′ 58.65″ geocentric is 63° 43′ 10.6″; and deducting this from 90° we have 26° 16′ 49.4″, which is within 2 seconds of arc of the mean of all Professor Symth's measures of the angles of descent and ascent of the inclined passages.

18. The perimeter of the base of the pyramid, 36,524.2396, multiplied by π, and divided by three times the difference between the cosine and sine of latitude 31° 36′ 42.62″ = 29.530588 = length in mean solar days of the moon's mean period, or time from new moon to new moon.

I have not yet been able to meet with any determination of the exact longitude of the pyramid, and cannot, therefore, give any reliable results depending upon the difference of longitude between the pyramid and Jerusalem; but I may state that it seems probable that the distance of the pyramid from the plane of the central meridian of Jerusalem is equal to the diameter of the circle of latitude of the pyramid divided by 28, or about 245.15 pyramid miles.

The Observatory, Birkdale,
Southport, Lancashire,
February, 1883.

JOSEPH BAXENDELL.

A REPLY TO CAPTIOUS OPPONENTS

BY A LADY MEMBER OF THE OHIO AUXILIARY SOCIETY—READ BEFORE THE SOCIETY.

It may appear presumptuous for a lady to attempt a reply to gentlemen of scientific research. But it is difficult to longer maintain silence under the unfair treatment continually received at the hands of gentlemen of opposite views; and, encouraged by recalling the old-time fable of the little mouse who severed the bonds that held the monarch of the forest captive, I have consented to try the experiment, if perchance some little word of mine may pierce a crevice of the armor through which a weightier one could not find entrance.

If I may not be able to prove that our position is a correct one, I may at least hope to show that we have a right to hold it, and should be entitled to respectful consideration, and honest, straightforward warfare.

The little handful of men and women here, who believe that a perfect system of weights and measures is embodied in the Great Pyramid, are not unique in their belief. For centuries men of giant minds, aye, some of the greatest the world has known, and of many nationalities, have turned their eyes wistfully toward this mysterious monitor, sincerely believing, that, if they could learn to read it aright, the truth was there. This

idea has always had its opponents; but even they, when candid, have been forced to admit many of the points we claim to be true.

Professor Eisenman, at our last meeting, cited Fergusson. We think his reading was at least partial, as Fergusson says, Vol. I., page 97: "There may have been some error in the measurement" (as he gives it) "derived from a single coping stone." On page 98 he says: "Piazza Smyth's calculation is probably the most exact," and adds, "but whichever measurement we adopt we get the very common proportion that the height is to the circumference as the radius is to the circumference of a circle; so near a coincidence that it can hardly be accidental, and if it was intended, all the other external proportions follow, as a matter of course." Page 99 he says: "The passages and ehambers are worthy of the mass; all are lined with polished granite."

But Professor Eisenman had studied his lesson well, and knew just where to cut his reading short. Fergusson was only looking at the pyramids from an architectural point of view, and not in order to study their meaning, and allows that for his purpose, he took as near as may be, the mean measurements. He does not dwell at length upon them, but disposes of all the pyramids as a class, in a half dozen of pages. The professor read a little foot note about the two measures that Colonel Vyse gives, as though he had discovered something entirely new, when all pyramid students know that the only actual measurements we can take at the present day, is as it stands—partly buried with sand and debris, worn away by the sharp sand storms of scores of centuries, and denuded of its former outward casing of stone. The theoretical measure is the one that is calculated, by adding to this actual measure, the probable measure of the casing stones—based upon the size of the two discovered in their original position by Colonel Howard Vyse. Is there anything unreasonable in this? If so, Fergusson makes a like mistake when he calculates the slope of the different pyramids. Fergusson does not claim to have made any measures or observations personally, but quotes from Colonel Howard Vyse. Shall we take Colonel Vyse's measures at

second-hand, from Fergusson: or shall we go to Colonel Vyse himself? He tells us in his book entitled, Operations Carried on at Gizeh, vol. I., page 261: "After having gone round the several works, I was sent for about two o'clock, as the casing stones at the base had been discovered. The size and angle of the building could therefore be exactly determined, and all doubts were removed respecting a revetment." In volume II., page 109, he gives us all the measures of all parts of the Great Pyramid. As we were only speaking of the base measure we shall only quote that one, which he gives as 764 feet; the former measure calculated by adding the measure of casing stones to the measure of the present base, which is 746 feet.

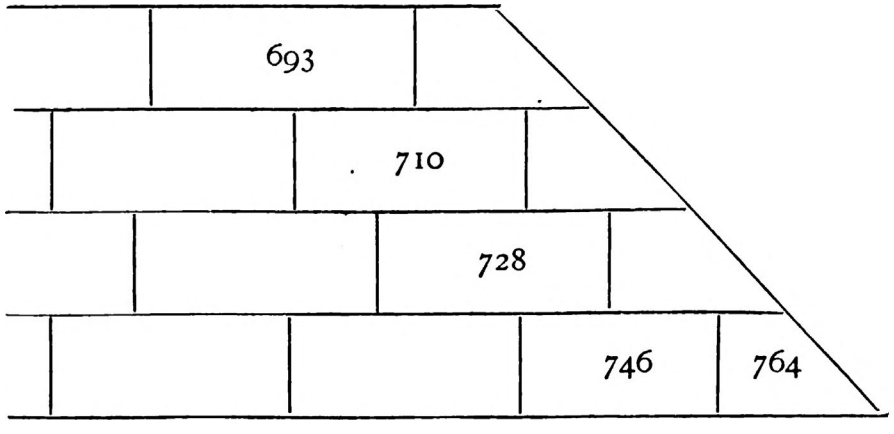
(Mr. Latimer in the very beautiful demonstration he gave us at our last meeting—and which Professor Eisenman endeavored to overthrow by Fergusson's quotation of Vyse—took a measure between that of Le Pere, of Coutelle, and that of Colonel Perring, viz: 763.9+).

We have given Colonel Vyse's testimony. Had he not, equally with Fergusson, a reputation at stake? Vyse spent nearly £10,000 of his own fortune, to find out the truth and publish it to the world—giving his book which embodied it to his own government as a legacy to the scientific world. Shall we listen to him, or shall we let Fergusson tell us what he thinks Vyse ought to have made it?

By referring to John Taylor's The Great Pyramid—Why was it Built? page 16, we find a solution to the oft repeated question: "Why is it that the recorded measurements of the Great Pyramid differ so widely?" The testimony runs through ten pages, and proves conclusively, that, strange as it may seem, these measures were all correct at the time they were taken. But to understand this you must remember that a large part of Egypt is covered with shifting desert sand. And during the heavy wind storms that prevail there, these are deposited around the base of the monuments. The deposit of sand around the great Sphynx at one time covered all but the head; so that photographs and cuts of it are common which represent only a gigantic head reared above the sandy plain. Early in the present century, however, M. Cavaglia made ex-

cavations, which were followed, later, by those of M. Mariette, and which revealed a body like that of a lion couchant, with a temple between the forepaws; the whole monument measuring 142 feet in length by 65 feet in height. These sands are constantly changing according to the direction of the wind; and who shall say that, because the sphynx is now once more partially buried, the former measures were incorrect?

The most ancient record we have of pyramid measurement was made by Herodotus, who gives 800 Grecian feet. The next by Diodorus Siculus, 700 Grecian feet; Strabo follows with a little less than 600. The earliest measurement in modern times of which we have the record, is that made by Professor Greaves, in 1637. He gives us 693 English feet; the sand probably covering the three lowest tiers of stone. In 1693, M. De Chazelles removed the sand to what he supposed to be the base, and found it to measure 728 feet. In 1763, Mr. Davidson, digging still deeper, found the pavement, and measuring the actual base, without the casing stones, made 746 feet. After which Le Pere and Coutelle continuing the investigations discovered the sockets, and measuring from the outer edge of these, make it 763.61+. In 1837 Vyse's pertinacious investigations brought to light two of the casing stones, miraculously left in their original position. From these the exact calculation could be made of the original size of the pyramid. This whole theory is confirmed by measuring the four lower tiers as they stand to-day, which give us these exact measurements.



So much for the outside measures, for which, in their existing state, perfection has never been claimed.

Now we shall try to show that it is not an utter fallacy to claim that the foundation for a perfect system of weights and measures can be found within the King's chamber, given to us in stone—not "an old limestone box," as we have so often heard these gentlemen sneeringly designate it; but in a real granite coffer, of which a celebrated writer says: "This coffer is of such beautifully fine material that for centuries scientific men were undecided what name to give it. Evidently it was not limestone. What stone was so beautiful, so hard, so capable of the highest finish?" A celebrated Mediterranean traveler, over one hundred years ago, decided that it must have been fused and cast in a model, as it appeared to be of a vitreous character. And all writers on the subject agree that no lapidary ever gave to any gem a higher polish than this coffer received from the hand of its maker.

No, gentlemen, you are greatly in error when you speak in these terms of this coffer, which has remained an unexplained mystery for over forty centuries; and which has never failed to interest anyone who has ever seen it, if they had a mind deep enough to be stirred by a thing utterly beyond their comprehension. There are those who are born blind. There were those 1800 years ago who, looking upon our Lord, saw only the carpentér's son. All such have our sympathy, while our pity would fain give them sight.

As well might you speak of the indestructible diamond, as common glass; of Mr. Bidwell's steel inch, as an old iron block. Granite and limestone are relatives, it is true; so are the dull, black, ugly-looking carbon point and the living, flashing, imprisoned sunbeam we call a diamond, yet how wide their difference! Inspiration did not err, but scientific men do a very foolish thing when, to carry their point, they either fail to state the case fully or stoop to false assertion, or attempt to confuse or confound their hearers by using as synonymous terms, names as wide in their significance as these. Gentlemen, be fair! We do not ask you to believe a falsehood. We do not wish to misrepresent. As deeply as pyramid students are imbued with

a belief in the inspiration of the Great Pyramid, they do not ask you to believe a fallacy. We tell you what we believe to be a truth, and ask all to examine for themselves, and see if these things be so. If, upon investigation, you find them to be false, come forward and prove them so. We invite you to fair, open argument. Do you meet us with argument? Do you not try to smother our arguments with cowardly denunciations, with hot-headed vituperations, with contemptuous, sneering ridicule, and vaunted assertions of what you can do, but never have done?

We ask cool-headed study, and convincing proof. Denial is not proof; counter assertion is not proof; sneering ridicule is not proof; partial testimony is not proof. We are commanded to "search the records and see if these things be true." When you have convincing proof of their fallacy, bring them here and show them to us, with the true manliness of conscious rectitude, and convince us we are wrong. You fear to study, lest your eyes be opened to the truth. Do you think blasphemy, sneers, and denunciations should silence us? These are not the weapons of true science, but of vain braggadocio.

A little less than two centuries ago, "what is granite?" was an open question; and as late as 1776 so renowned a traveler as Forbes thought it worth his while to give an analysis of it in one of his books of travel. But in these days of widely diffused knowledge, when it would be almost presumptuous to suppose that any little miss in her teens could not define the word, and dwell upon its beauty, its susceptibility of fine, clear-cut workmanship, and high polish, and above all, its indestructible character, surely, we should hardly have the temerity to suppose these gentlemen to be ignorant of these well-known facts. It has seemed much less impertinent to take the other horn of the dilemma, and accuse them of ignoring the truth.

I quote from volume vii, page 12, of Library of Universal Knowledge: "The success with which the Egyptians operated upon this refractory stone is very extraordinary. They worked and polished it in a way which we cannot excel, if, indeed, we can equal, with all the appliances of modern science" —mark that, "with all the appliances of modern science; and

not content with polishing it, they covered some of the blocks with the most delicate and sharply cut hieroglyphics." These, after the abrasion of the storms of forty centuries, are as clearly distinct as some of our recent epigrammatic efforts.

We have here been told, with an emphasis intended to be altogether unanswerable, that "this is an age of iron and steel; that the half or wholly barbarous age of stone, is buried in the dim past; that there we had better leave it; that it has grown grey with age; that it has outworn its usefulness, and been distanced in the nineteenth century race for improvement; that henceforth the grave of oblivion is its only refuge." And have we become so perfect in knowledge that the past has nothing to give us that is worthy our acceptance?

Yes, "this is an age of iron and steel" indeed! And as a memorial of it, on the centennial of our Nation's birth a steel flag-staff was placed in Monumental park. Will it stand there four thousand years from to-day? And will Egypt or some other foreign nation be so much impressed with this wonderful relic of the age of iron and steel that they will transport it to their own land, as our Nation has recently brought hither the great obelisk from its far away home? It is unnecessary to wait so long to have our question answered. The well-known perishable nature of the material is answer enough. The hope that it would remain to tell its story for the comparatively short space of one century, was considered so doubtful by even its warmest friends that, as an aid to preservation, in its earliest infancy, it was enveloped in a good thick coat of white lead. Would this be a good material on which to cut the hieroglyphics that were to tell our Nation's history to generations yet unborn? Would it make a good material on which, or of which to make a record of our present standard of weights and measures, to transmit to the nations four thousand years from to-day? If so, could you measure it in December with the thermometer at zero, and again in July when the thermometer indicates 98° in the shade, and find the measures to correspond? Or, in one of the hottest summer days could you measure the north side, where it was kissed by the lake breeze,

and the south side, where the sun was bestowing his warmest and most passionate caresses, and find even the two sides to give back the same record? Mr. Bidwell himself acknowledges that his vaunted perfect steel inch could not bear the warmth of a human hand for a single moment without throwing it all out of tune. If this is the material that science would choose on which or of which to make a record of mensuration for the use of future generations, which would choose the best, science or inspiration?

Dr. Smith has a piece of glass upon which one of the members of our society, Prof. Wm. A. Rogers, has marked with the most scientific accuracy an inch, which is, moreover, divided and sub-divided into such minute parts that it requires a microscope of the highest power to trace them. The fragility of this material would seem to condemn it. But even were it as indestructible as granite, its extreme sensibility would seem to militate against it. But grant these gentlemen that either has found the material most worthy of notice in this age of advanced thought, and what would they gain? For the sake of argument admit that *to-day* a memorial of perfect measure should be made in steel, or glass, or both, if you please, and what do you gain?

We are not seeking a material on which to record a standard of measure for posterity. We are striving to secure our own inheritance, as a foundation on which to build a perfect system. We are searching for the records of divine standards, left for us by our ancient forefathers, and perpetuated in the most suitable and enduring material they had at command; and which by its successful endurance has proved, that if they were not really inspired, they wrought more wisely than they knew, or could ever have hoped for.

Several reasons have been given for placing this monument where it is, because of its latitude, longitude, land center, etc., but the following is the most potent reason: The mild climate and equable temperature of Egypt are peculiarly adapted to the preservation of stone monuments. Even the limestone monuments, that count their centuries as we count our years, are to-day telling the story of their youth, to those who have

learned to read their secrets. And travelers in that land of wonders tell us now of the marvelously perfect and sharply-defined outlines of the most minute carvings of that remote age.

Is the whole pyramid built of granite? By no means. The solid masses of masonry are of limestone. Even the grand gallery is not granite. But the walls of the King's chamber are of granite; and all writers on the subject (Fergusson included) agree that they are polished equal to any gem. For an example of this polish look at the engaged columns in the façade of the Wilshire block on Superior street.

The coffer we have heard sneeringly denounced as "your old stone box." Ah, my friends! a wiser than I has said: "There are sermons in stones." Science sometimes evolves some of her most beautiful lessons from things as homely and commonplace as an "old stone box." Franklin was not too scientific to listen to the sermon from the clouds, even though the medium was a common door key and a kite string. Watt's sermon was preached by his mother's teakettle; Newton was willing to be taught the great principles of gravitation by a wormy apple, so poor it was disowned by the parent tree. Plato, Socrates and Galileo were all willing to listen to sermons preached by the simple surroundings of everyday life.

Yes, "sermons in stones," and to him who has ears to hear, that coffer can tell things wonderful, and mystically beautiful. He who stops either the outer ear, or the ear of his understanding, does but defraud and cheat himself. This coffer was a perfect gem, in form and finish, when first discovered, and had remained so for thousands of years. Not only was it placed in a climate most perfectly adapted to its preservation, but in a chamber in the heart of a mass of masonry so great that an unvarying temperature of 68° Fahrenheit, has been preserved for all these ages. Then as an additional security, it was *sealed* up until time was ripe—until "many should run to and fro, and knowledge should be increased"—sealed up in a mass of masonry twice the height of our electric masts, and of such cyclopean proportions, that if we desired to place it in Monumental park, it would first be necessary to cut away the surrounding buildings, to the depth of sixty feet on every side.

And yet Mr. Latimer calculated to a nicety, the number of grains in the whole mass, on the theory that it was a decimal multiple of the earth's weight, and his error or discrepancy in the whole calculation only equalled the size of an ordinary dry goods box.

France has proposed that all the nations should unite, in erecting a building in which shall be constructed a chamber that shall always remain of uniform temperature, to be used as a place of deposit for standards of "weights and measures."

Could not boastful modern science possibly devise some other plan for the accomplishment of this desirable object, than to follow in the footsteps of the builders of Gizeh's pyramid? Why not avail of this same pyramid and thus avoid the delay and expense incident to such an undertaking?

The facts concerning the measures hidden in this chamber and its coffer have been presented to you many times, and so much better than I could give them, that I shall not dwell upon them. But they are there. And they are much too numerous, too beautiful, and too mathematically correct, to be the result of chance or mere coincidence. Chance did not place them there; chance did not preserve them; chance did not reveal them. Is a more accurate system of weights and measures needed for the advanced necessities of this "age of iron and steel?" Do not be too vain-glorious to accept the standard from the hand of God, even though it come by the way of the Pyramid of Gizeh and its sermon-reading coffer.

CARRIE L. SEARLES.

EXTRACTS FROM *"UNIFICATION OF MONEYS, WEIGHTS, AND MEASURES."

The great diversity of systems used in weighing and measuring, and the vast variety of monetary systems among the different nations of the earth, are evils which have long been felt and are universally acknowledged. The inconveniences and losses resulting therefrom are becoming continually greater and more apparent with the constantly increasing facilities for international communication, whereby people and commodities of distant regions are being brought into more constant and immediate contact.

Among the most useful things which have become nearly universal are the Roman alphabetic letters, the so-called Arabic numerals, and the written language of music. A conviction of the advantages and benefits of these unities is felt in every industry, every profession and occupation, in every branch of science, art, and literature; and a like conviction of the importance and necessity of a universal system of weights, measures, and moneys, is being awakened in the public mind—in the mind of the whole civilized world. It spreads with the increase of commerce, the exchange of ideas, and the diffusion of knowledge. A movement so peaceful, so desirable, and which has become so universal, is not likely to cease nor to decrease, but must naturally spread and increase in extent and in velocity.

A rational or philosophical reform in the monetary system is intimately connected with a reform in measures of length; in fact, is so dependent upon it and is so inseparable from it that it would seem to be impossible to make such monetary reform unless it were preceded by or accompanied with the necessary reform in linear measures. Should such reform be decided upon, a reform in weights and measures of capacity is no less needed, and all are so connected that the work of amendment to be complete and efficient should embrace all. The greatest

* From the International Review.

objection to the metric system results not from any defect in the plan on which it is established, but from inherent defects in the denary system of numeration. A large number (perhaps a large majority) of the well educated have been accustomed to regard the decimal system as possessing a peculiar beauty and expressiveness from the great facility with which the ordinary operations of arithmetic are performed by it. Indeed, after laboring at the tedious and troublesome reductions of compound numbers (consequent upon other scales of progression), unfortunately so often required to be made, the relief of a single addition or multiplication in the homogeneous units of our common scale is too striking not to excite a feeling of admiration for the easier process. It appears not to be generally considered, however, that this facility of computation is in no respect due to the series of "tens" by which we count, but is derived exclusively from the admirable notation in which the series has been clothed, and through which alone we are in modern times made acquainted with it, and from the perfect conformity of the notation to the series.

The unit of linear measure is that which must give law through the whole system, and consequently the great starting point in any comprehensive system of reform must be the standard of length. What standard, then, shall be adopted? Shall the French metre be taken, or can some other unit of measure be found which possesses superior advantages? Looking at the subject theoretically, and discarding all existing systems, there can be no doubt that a much better one than any of them can be devised.

All experience has shown that the primary and most needful division of all the more common units of measure is into halves and quarters, a convenience or necessity which cannot be supplied by any other ratio of division. If it were required to divide a given quantity of grain or of flour into two, four, eight or sixteen equal portions, this could be effected with perfect precision by the aid of a balance, without the employment of any weights or standards. If it were similarly required to divide the quantity into equal thirds, fifths, sixths, sevenths,

ninths, or tenths, the accomplishment would be simply impossible, and, even with the assistance of weights, would be found to be a very difficult and unsatisfactory problem. Any one can fold a ribbon into eight exactly equal parts; no one can fold it into ten exactly equal parts.

This prime importance of a binary scale of measures results however, not alone from the far greater facility with which all quantities, whether linear or superficial, liquid or solid, can be so divided, than by any other scale, but also from the fact that the mind has a more ready apprehension of the binary than of any other ratio of numerical progression. And by this scale alike the wise and the simple would approximate an undetermined quantity. This halving tendency is thus inevitably fixed upon the customs of a people by the duplex bond of a subjective as well as an objective reality. It is, therefore, neither remarkable nor unreasonable that whether the customary units be feet or acres, yards or miles, quarts or gallons, pecks or bushels, pounds or hundred weights, or tons, the universal popular demand should establish the halves and quarters of these standards as their indispensable factors. And this requirement of the "popular common law," it is proper to observe, is wholly irrespective and independent of any tabular scale appointed by the legislative authority. As the fraction of a yard, the foot is an unknown quantity. Like the carpenter's inch, the yard as a unit has practically no divisions but the binary ones of halves, quarters, eighths and sixteenths.

Founded as this principle is upon a universal need and quality of human nature, it is, of course, not peculiar to any people or country. In France, where a universal decimal system has been established by law for more than half a century, the tradesman persists in cutting up his metre into fourths and eighths, and in utterly ignoring the decimetres and centimetres provided by the wisdom of his rulers. The same development has occurred with the kilogramme, the prevalent unit of weight, and with the litre, the common measure of bulk. So that, for all the purposes of shop accountancy, the ideal simplicity of the decimal system has been practically illustrated by a complex and troublesome aggregate of centesimal and millesimal

fractions. If we ask for so simple a measure as three-fourths of the metre, we can find it only in 75 centimetres; and if we desire to measure 6¼ centimetres (the sixteenth part of the metre), we can find no mark upon the scale to give it.

Apparently, these difficulties cannot be overcome in any other way than by the introduction of the octonary system in the place of the decimal system of numeration, as formerly proposed by the author.* At the same time it is believed that, even were the octonary arithmetic, with all its own intrinsic excellence, not to be adopted, the octonary weights, measures and coins would be worthy of an independent establishment. After the variety of arithmetical reductions to which we are now accustomed under our present incongruous tables, the uniform reduction of a single scale, which would alone be required in the new order, would give a very great simplification and relief, and would in every possibility be found upon the whole to entail less inconvenience than that which would remain with even the perfect decimalization of our various measures. So that, even under the disadvantages of a decimal dispensation, we believe it could easily be shown that this octonary distribution of weights, measures and coins would still, in view of all the circumstances, be the "best possible" one for popular use, and would most completely furnish the elements of a perfect uniformity.

The relative merits of the metric or decimal system and an octonary scale of measures may be concisely summed up in this: that the former would save a considerable amount of calculations in all the accounts and arithmetical operations of the counting house; the latter would save a large amount of trouble, annoyance, and confusion in all the dealings of the shop, the warehouse and the market. If it be the principal or most general office of a scale of weights and measures to facilitate bookkeeping, then, with our present education, is the decimal system obviously the best. If the primary and most important function of such a scale be to provide for the readiest

*See "Reports on Weights and Measures," read before the American Pharmaceutical Association in 1859, and published in their volume of proceedings for that year, and from which report much of the present paper has been taken.

division, the most accurate apportionment, the broadest distribution of all material property—to facilitate, in other words, the active employments of the tradesman, the artisan, the builder, the machinist, the engineer—then is the octonary system clearly the best. It has been fully shown that under our existing form of arithmetic these two great objects cannot be fully attained, and we already have, to some extent, a compound system in weights, in measures, and in prices. Which, then, can be sacrificed, and which preserved, with greatest wisdom? Of the two opposing disadvantages, which can be selected as the smaller evil? Which is to take the precedence, the mart or the counting-house?

In regard to the range and number of persons to be reciprorocally affected by the selection, there could scarcely be a question. In regard to the character and relative importance of the respective conveniences, there would appear to be almost as little room for doubt. If it is shown that uniformity in many other relations than those of simple number, and no less vital to the interests of art, trade, and commerce, has been constantly and irretrievably sacrificed to the decimal despotism; if it is established by the voice of all experience that neither national nor international standards of length, of weight, of area, of volume, or of value, of any single subject, in short, to which these figures can be usefully applied, have ever the slightest hope of obtaining a general authority under its rule, then must it be dethroned and a new dispensation introduced, developed from such principles and invested with such attributes that it may rationally be expected to gain at length a universal ascendancy, through the concurrent approval and adherence of all intelligent nations. For the attainment of a real uniformity there seems no other process or alternative, and for such an attainment no sacrifice of temporary convenience could be held to be too great. The faults of the decimal system are too radical to be amended—too obnoxious to be endured. Sheltered by the inertia and conservatism of inveterate habit, it has been tolerated already much too long. The unskillful contrivance of an early age, it is all unsuited to the wants or uses of an adult manhood of the race.

The number 8 is preëminently the fitting number for giving law to the distribution of weights and measures and coins. First (and beyond all other considerations), because it admits of continued bisection till we arrive at the unit. Secondly, because it is a perfect cube number, a quality which establishes the most precise and definite relations between linear extension and capacity, so that the cubical measure of volume, whether liquid or solid, and the cubical standard of weight, have each a simple integral expression in the linear scale of measure. Thirdly, because it requires no subordinate divisions, whether in coins or in weights, in lengths or in vessels, excepting the halves and quarters of each unit—these having also integral values—to give every possible numerical range; and, lastly, because with all these combined advantages it presents the most convenient mean of magnitude between a too contracted and a too extended scale of progression.

To illustrate the advantage of employing a cube number for a metrical radix, let us resort to an imaginary scale of lengths; let the sixteen-inch rule (call it a "module") be assumed as the hypothetical standard; let this module be divided into two equal "spans" (of eight inches each); each span into two equal "hands" (of four inches each); each hand into two equal "digits" (of two inches each). This would furnish us with one octonary stage, to wit: eight digits make one module, with the intermediate progression of two digits to the hand, two hands to the span, and two spans to the module. Let it be further assumed that the cubic digit should give the standard capacity measure, the pint (though in fact its volume would be less than half that measure), and that eight of these pints should make the gallon, eight gallons the bushel, and eight bushels the quarter. Then the gallon would be exactly measured by one cubic hand, the bushel by one cubic span, and the quarter by one cubic module. In like manner every ascending octonary measure of capacity would have a precise linear standard (two modules, four modules, etc.) for the side of its cube.

To illustrate the contrasted awkwardness and complexity of a decimal system of weights and measures, let the French litre be selected. The litre is the cube of the decimetre; ten litres make

one dekalitre, and if we would seek the cubic measure of this quantity, we shall find by a troublesome process of extracting the cube root that two decimetres, one centimetre, five millimetres and a decimal fraction, .44347, and so on interminably, will give us an approximation to the length of the side within an assignable limit of error. In other words, although there certainly is a cubic vessel that shall contain exactly ten litres, it is not within man's art of mensuration to tell precisely what the size of that cube must be.

If, on the other hand, it was required to find the dimensions of a vessel holding exactly eight litres, we know that a cube of two decimetres will give the measure with absolute precision; or, if on the descending scale, it were required to find the size of a vessel holding exactly one-eighth of a litre, the cube of five centimetres gives us the perfect solution.

Having thus shown some of the advantages resulting from an octonary distribution of weights and measures as contrasted with the metric system, the next subject that demands consideration is the determination of the unit which shall be taken for our standard of linear measure. In selecting a standard of length (without any reference to its ideal derivation), two considerations of very obvious and primitive notice impose a tolerably definite limit as to what should constitute the length of a useful, popular measuring rule. The first is that it should be conveniently portable, if not in a pocket, at least in a satchel, or upon the thigh. The second is that when held by one hand in careful and precise position for taking or giving measures, its two ends should each be distinctly within accurate view, and within easy reach of the free hand for precise marking, without any constraint or effort of the body. These two conditions, which would both be assigned on perhaps one-half the occasions of its familiar use, render it tolerably manifest that its length should be not less than twelve inches, and while certainly excluding the yard-stick and the metre, would probably designate the carpenter's two-foot rule as reaching the maximum limit of practicable length. Both the French metre and our own yard-stick are very awkward and inconvenient standards, being too long for all the ordinary purposes of mensuration, excepting

itinerary measure, and as a proper standard utterly useless except on the counter of the draper. Moreover we would naturally select such a rule as we would measure our houses by, or the furniture within them; such a rule as the carpenter would cut or lay off his boards by; such a one as the mechanic could use in his workshop, or the machinist handle in fitting his engines. Theoretically, it matters little whether our unit of reference be the inch or the mile; but for the practical business of daily life it becomes a matter of the very highest importance that our unit of measurement should be such a one as shall have the most convenient and universal application.

A resort to the French metre, as a standard, would be in every respect objectionable, unless we should accept along with it the entire metrical system; and it is not believed that the system itself, in its present form, possesses the elements of a general ascendency or even a permanent establishment.

Our adoption of the metric system, and the consequent change of our linear unit, would sever our uniformity with Great Britain, a country with which three-fifths of our foreign commerce is transacted; besides which it would entail great inconvenience and much greater expense than is usually imagined. The measurements of every plot of ground in the United States have been made in acres, feet, and inches, and are publicly recorded with the titles to the land, according to the record system peculiar to this country. What adequate motive is there to change these expressions into terms which are necessarily fractional, and in which those foreign nations whose convenience it is proposed to meet have no conceivable interest? What useful purpose is subserved by designating a building lot 20 by 100 feet, in the form of 6.095889 by 30.479448 metres?

Besides this, the industrial arts during the last fifty years have acquired a far greater extent and precision than were ever known before. Take, for instance, the machine shops, in which costly drawings, patterns, taps, dies, rimers, mandrills, gauges, and measuring tools of various descriptions for producing exact work, and repetitions of the same with interchangeable parts, are in common use.

It has been calculated that in a well regulated machine shop,

thoroughly prepared for doing miscellaneous work, employing 250 workmen, the cost of a new outfit, adapted to new measures, would be not less than $150,000, or $600 per man.[1]

Supposing full consent were obtained for using metric measures in all new machinery, how slow and difficult would it be to make the change. A very large proportion of work consists in renewing worn parts; where then are the new measures to come in? The immense plant of railway motive-power in the United States is all made to inches and parts. At what time can a railway company afford to change the dimensions of the parts of a locomotive engine? At no time, because the change would require to be simultaneous in the whole stock. It is true that the old dimensions might be adhered to, and called by metric names, putting 0.0254 metres, or 25.4 millimetres, for one inch; but this would be only an evasion, not a solution of the problem.

As we have shown, the metre as a standard taken from nature is a failure. For all practical purposes, a platinum rod kept in Paris is the standard metre, and this has no special advantage over the brass rod kept in London as the standard yard.

As we have shown, the decimal subdivisions and multiples of its units are the inseparable and insuperable defects in the metric system.

In the Report on Weights and Measures by the author, previously alluded to, the derivation of a new standard is proposed which it is believed would prove satisfactory, and which, upon the introduction of an octonary arithmetic or system of numeration, should be insisted on. In view of the various considerations we have stated, we believe it possible to construct an octonary system of weights, measures, and coinage, that shall embrace, in equal degree with the metric system, all the great elements of simplicity and uniformity, in addition to the immense advantages heretofore mentioned; and while a new standard would be more philosophical, we believe that the adoption of the English inch, or a multiple of it—the inch being the one-thirty-sixth part of the standard yard, which is also

1 See "The Metric System in our Workshops, etc., by Coleman Sellers." Journal of the Franklin Institute, June, 1874.

our standard yard—with an octonary distribution of the various tables of weights, measures, and coins, could be much more readily accomplished, since it would leave undisturbed all linear measures of Great Britain and of the United States, and would, in our opinion, possess all the essential elements for a successful adoption by both countries. It would also serve to prepare the public mind for the further introduction of the octonary system of numeration.

If it be objected that a system differing essentially from that of France could not expect to be received in that country now, the answer is obvious. Very much better is it that France should suffer the temporary inconvenience of changing her present system for a better one, than that America, Russia, and England, should suffer the permanent inconvenience of taking an imperfect and unsatisfactory system.

An entire remodeling of our coinage would, of course, be necessary under our octonary system. That such a remodeling is really very much needed, notwithstanding the vaunted excellence of our currency, and its real superiority to that of almost every other nation, may, we think, be very clearly shown. The universal prevalence of binary divisions, rendered necessary by the wants of trade in all its departments, and the signal inability of the established system of coinage to meet such want, are obvious. As specie is merely the representative of value, the proportions of it required in exchange for commodities must, of course, be determined by the necessary or convenient divisions of the commodity, and not by the size of the pieces which make the money. If the two are incommensurable, a sacrifice is demanded. Of the smaller articles, usually sold in packages, a dozen forms the most common measure; but we are aware of no single article being usually put up by tens, in correspondence with the coins which are to purchase them. Even articles of furniture, such as chairs, plates, cutlery, etc., are generally sold by the dozen, but never by the decade.

ALFRED B. TAYLOR.

*JOHN TAYLOR.

The subject of this sketch was born at East Retford, in the county of Notts, on the 31st of July, 1781, and died on the 5th of July, 1864, at his residence in Kensington, London.

Had he lived a few days longer he would have completed his eighty-third year, in full possession of all his faculties, with the exception of his eye-sight, which became in the last two or three years of his life so defective that he could scarcely see the characters he was tracing. Under these circumstances he could study but little; yet so clear his memory remained, that he could refer with ease to his favorite volumes, and indicate precisely the page where might be found the passage he wished to have read to him.

In appearance he was extremely prepossessing, with a countenance you felt you could not only like but trust. His bearing was benign and dignified, yet simple, combined with a certain amount of calm reserve, giving one the idea that his confidence and friendship were worth acquiring and keeping. He fought through life a losing battle, and was denied that fame which was justly his due. But as his conduct proceeded from a disinterested wish to establish principles which he held to be most conducive to the welfare of the nation, he never lost heart, and want of success left him cheerful and happy in the consciousness of duty performed.

At the age of fourteen he was bound apprentice to his father, a bookseller. He had been sent in early life to the grammar school at Retford, where he was well grounded in Latin, Greek, and elementary mathematics. The good foundation laid in his youth, joined to indomitable, industry and imperturbable method, with ceaseless self-culture through a long, quiet life, made John Taylor what he was, a man of deep, varied, and extensive information. At the expiration of his apprenticeship with his father, he determined to try his fortune in London; and happily obtained a situation in the then great house of

*Abridged from the Biographical Notice of John Taylor, in "The Great Pyramid." by Mrs. Piazzi Smyth.

Lackington, in Finsbury Square, the greatest publishing house of that day, and called the "Temple of the Muses." From Lackington's he went to Vernor & Hood's, another great publishing establishment. Here he made the acquaintance of the well-known Tom Hood, who afterwards became his sub-editor of the London Magazine. Leaving Vernor & Hood's he set up in business with his friend, Mr. Hessey, at 93 Fleet street; but on the establishment of the London university, Taylor being appointed their publisher, he removed to 30 Gower street, where he took up his residence. At both these places of abode his hospitable table and his "publisher's dinners" formed the center of a large circle of literary friends; not the wealthy and the great alone, but talent and genius were ever welcome, for Taylor's heart and hand were always open to help the needy. Here it was that John Clare, the poor rustic Northamptonshire poet, had his mental gifts first acknowledged, was first received and treated as an equal. Another poet of higher strain than Clare, was also indebted for his first encouragement to John Taylor. This was John Keats, the author of Endymion, who found in him not merely an appreciative publisher, but also a sympathizing friend.

Mr. Taylor's life was a busy one. Not only had he the daily claims of his shop to attend to, but a large publication business was added to it; he being, moreover, his own reader, and superintending entirely that department. During this period his commonplace books show the vast range of his various inquiries. He had studied old English (Anglo-Saxon), Welsh, French, and Italian; he had also turned his attention to astronomy, not in the popular sense, but as a working, practical mathematician. His varied extracts show the calibre as well as the minuteness of his studies, and how he trained himself by his extreme attention to details, which resulted in giving remarkable strength and precision to his future literary efforts. In 1813 Mr. Taylor first became an author, when he printed a pamphlet entitled The Discovery of Junius, which was afterwards enlarged into a volume, under the name of Junius Identified with an Eminent Living Character. This was Sir Philip Francis, and the world seems to have since then held that the

identification was decidedly correct. In 1821 Mr. Taylor became editor of the London Magazine, and held that office until 1825, during which period he wrote much fugitive poetry, essays, and other papers, which have not been collected.

He was throughout life a student of Holy Scripture, and devoted much time and labor in its examination, as his works, The Emphatic New Testament, 1854, and Light Shed on Scripture Truth, 1864, abundantly testify. He was likewise a careful student of prophecy. There was still another point on which he bestowed much labor, viz: the tracing of the measures of length and of content that are in use in this country to the dimensions of the Great Pyramid of Jeezeh and of the coffer therein. His investigation of the subject resulted in the publication of two works, The Great Pyramid; Why was it built? Who built it? and a supplement entitled, The Battle of the Standards. These works were brought to the notice of Piazzi Smyth, and his study of them led him to the conclusion that Mr. Taylor had well grounded reasons for his bold assertion, which had frightened away half his friends, viz: that the Great Pyramid must have been erected under divine instructions to its architect.

Early in the year 1864 a correspondence began between the aged author and Piazzi Smyth, a correspondence soon terminated by the death of the good and wise old man. In a letter dated March 29, 1864, he says:

"I had, as you suppose, mentioned in my book the inference deducible from the fact of a common origin of weights and measures among the most civilized nations of antiquity. It speaks irresistibly in favor of a common origin of all mankind from one source. I see no difference between the man who first gives utterance to such a remark and the man who approves it when he hears it uttered. I am a thinker, and I cannot do otherwise than to act in my vocation. But it is necessary that many should approve before the thought can enter into the popular mind, and if that result ever takes place, I am only one among many who are entitled to any commendation; nay there is no room for commendation to any one, for all do but impart what has been given them. Paul may plant, and Apollos water, but God gives the increase, if that ever takes place."

On May 27, 1864, a letter came from a lady, the daughter of one of Mr. Taylor's oldest and dearest friends. She wrote:

"As an old friend I have come up for a short time to assist in nursing Mr. Taylor, who is in such a weak state, he is not able to leave his bed."

The closing scene must be told in the words of this kind lady friend. She says:

"On Friday, the 1st of July, I had just finished transcribing the little book that I had come upon purpose to copy for him, when he said: "Now, my dear, it is finished, but it is not completed," and as he asked me to help him from the sofa to the chair, and reach him a large interleaved Bible, and he endeavored to explain to me a part he had wished to expound, but illness prevented him.

"All Saturday we thought he was dying—the dew of death seemed on his face—but at night, instead of sinking, delirium came on, and for thirty-six hours he wandered incessantly; but even in delirium his thoughts were all for the glory of God and the good of man. His prayers were beautiful. Again and again he would say: 'Oh! let me lie down, let me lie down in the arms of Thy mercy, and when I awake may I enjoy Thy blessing continually. Grant this, O Lord, for thy dear son's sake. Amen.' The next night his prayer had changed—it was now: 'Oh! let me lie down in the arms of Thy pity, and when I rise up, may I dwell in Thy presence forever.'"

On the 5th of July, 1864, sweetly and calmly closed the life upon earth of this most remarkable man—the first of men to whom has been vouchsafed in the modern world to discover traces of a primeval monumental message of divine inspiration.

The Institute is indebted to the courtesy of the lady referred to, for the portrait of Mr. Taylor which appears in this number of the Magazine. In a letter to the president she writes: "I send you, with pleasure, my precious photo of dear Mr. Taylor. No photograph can do justice to the inexpressible beauty of the smile."

In his last illness he frequently said: "God bless you. I say that many times a day, do I not? but many more times a day I say it in my heart." And once when he said sight was failing, he added: "But there is one thing I can see, a kind look, yes, that is the last thing I shall be able to see."

HOW TO PRESERVE A RECORD.

In response to the question of Mr. Dow: "What would be the most perfect method for preserving any record for the benefit of the whole world 4000 years after date?" I reply:

The true solution of this question depends upon the time of the propounding, the date on which its commencement and termination are predicated. If Mr. Dow had sought a solution of the motives and principles that must have actuated those who 4000 years ago would thus have sought the means of transmitting to this generation the knowledge they possessed, and which they knew would be profitless to the intervening ages, he would have expected very different responses from those rendered, and his own admirable paper would have been based upon an entirely different view of the case. He argued from this present date, and in explanation, assumed that what has now passed into history indicates very clearly how important truth might be safely handed down to posterity, however remote. But, so far as this is applicable to the real question, the elucidation of the mysteries wrapped up in the Great Pyramid, it fails in that accomplishment, inasmuch as it must ignore the major fact in the case, viz: that the knowledge so to be preserved, must be hidden from the world until the fullness of time had come. All the circumstances and facts of our own times, the unprecedented development of civilization and science, succeeding each other in such rapid progression, together with the almost incredible facilities for transmitting current events from every part of the world to every other part, all serve to render it impossible that any fact of history could be withheld from any people for a decade of years, much less for forty centuries.

To my mind the question only assumes importance as viewed from the standpoint occupied by our ancestors, to whom must have been revealed the necessity of concealing as well as preserving the treasures of knowledge and wisdom sacred to them. I would therefore endeavor to present some probable

experiences that must have preceded the determination on the part of our illustrious ancestors to construct the Great Pyramid.

In any age, the proposition to provide for the safe keeping of any record worth preserving and presumed to be of importance to mankind 4000 years in the future would, for the method to be adopted, be referred for investigation and decision to the men of most distinguished attainments in science, and their conclusions would be based on the scientific knowledge of their time, the most advanced state of the mechanical arts, and the general civilization of the world.

Four thousand years ago such a proposition must have been considered from an entirely different standpoint from which it would be looked at in our day; then the record itself could not have been engraven on stone, nor cast in the iron nor written on parchment; the art of writing was then unknown. In whatever form the record might have been prepared, its deep deposit in the bowels of the earth or its concealment in the dark recesses of a mountain gorge would not have availed without another record to hand down to future ages the fact of such deposit; while the traditionary line of knowledge, from its inherent defects, would lose sight of even the locality of the treasure. Thus the high purposes of the designers would have been thwarted through the ever changing pursuits and interests of mankind. Four thousand years ago it would have been unwise to have entrusted the precious record to the corner-stone of any temple, shaft, or monument, reared to perpetuate the memory of any reigning monarch, or to perpetuate the heroic achievements of a conquering warrior, for even then it could not but have been known that a change of dynasty—the success and towering pride of a later hero, would utterly extinguish all reverence and respect for such a temple or monument, and its destruction following would have prematurely revealed the hidden treasures, or forever obliterated them and so frustrated the purpose of the builders to convey to distant posterity that which was of superior value to themselves.

In such an age as that the subject would be sure to provoke the loftiest imagination of the enthusiast, the profoundest thought of the philosopher, and best skill of the mechanic alike.

Years may have been employed in solving a problem so important under a deep sense of the magnitude and majesty of the undertaking; all sources of information would have been consulted; all authorities invoked; every scheme presented would have been thoroughly weighed and investigated; the elements of safety, durability, and practical indestructibility would have been regarded as absolutely indispensable to success, whatever the method or plan adopted. Such method must be in itself, at once so marvelous as to challenge the reverence of mankind in all the intervening ages, arresting the curiosity, irreverence, and cupidity of the ever shifting nationalities of the world, and ever appealing to the highest instincts of the generations for its preservation.

When all possible tests had been applied to all plans submitted, and in turn all plans dismissed as untenable or impracticable, it might have been deemed as within the province of wisdom and prudence to invoke Divine light, to seek the directing agencies of the All-wise. The prophetic spirit duly invoked, to some favored soul may have been communicated a conception which no mere human genius could have compassed. Thus came the vision; the outlook all sublime, the inspiration to receive, the power of words to describe. To the astonished listeners came the words of prophecy—the command to do, as follows: "Lay deep in the solid rock, chiselled by the hand of art, in the most conspicuous part of this habitable globe, at its very center, balanced by all the land and by all the water, the foundations of a mighty structure, so unique in its form, so graceful in its proportions, so perfect in its symmetry and finish, with apartments so mysterious and yet so comprehensive, in mass so colossal and overpowering to the imaginations of men as to command forever their wonder, reverence and admiration, and so avert forever all human disposition to impair or destroy. In a word, build a pyramid; emblem of authority and truth, to the latest age, 'The Wonder of the World,' and in its sacred recesses deposit the priceless record in forms unintelligible to man until the kingdom shall have come and all men shall be permitted to see and know the 'I Am;'" and all the people cried in a loud voice: "Amen and amen."

In obedience to this inspired behest, the ancients, our immortalized ancestors, built the pyramid. The date of its construction has, in a great degree, remained ever since veiled in indefinite obscurity. Its real design has baffled and defied the genius of all the nations. If meant to conceal from human apprehension the wisdom of its builders—their knowledge of the science of mathematics and astronomy, and to make known only to the ages far down the vista of futurity, the history and prophecy of their times, and to perpetuate their mechanical skill and attainments in the arts, most significantly have all these objects been accomplished. For three thousand years the ravages of time and the wasting power of the elements were alike ineffectual to destroy it. The hand of vandalism in all this time was withheld from any attempt at its demolition. A sacred awe possessed the successive generations as in turn they gazed upon its unique beauty, its marvelous proportions and exquisite finish.

Safely the structure itself, and its concealed and mysterious treasures were preserved, and not until the fullness of the era in which they were to be revealed to the world had arrived, and when its learning and wisdom had compassed the power to appreciate and interpret them, was any hand permitted to mar its exterior or to delve into its interior recesses. To-day the world stands aghast at the temerity and vandalism of the barbarous horde that stripped the pyramid of its inimitable sheathing of casing-stones. The only consolation available to us for this wanton and brutal outrage is to be found in the fact that they wrought better than they knew ; laboring and expending their resources in vain, as they supposed, but in reality, opening up to the world a thousand years later the invaluable mysteries they failed to comprehend. In this way the very objects of our forefathers have been accomplished, and we are the recipients of their transmitted wisdom. To be thus blessed, to live in these last days, is cause for gratitude and rejoicing.

From our standpoint the history and fact of the Great Pyramid could not be repeated, nor could any other device within the scope of ingenuity succeed to the accomplishment of a like

or similar end. The advance of the nations in the arts that now so strongly mark the age, and which are so in contrast with the limitations of the ancients, render concealment, the great prerogative of the pyramid, an absolute impossibility. The facilities for the transmission of intelligence put the whole world in possession of the minutest facts of every-day life, rendering it far more difficult to conceal any records or to destroy or hide them from the knowledge of men than to keep them intact for the use and benefit of all coming time; so that a duplicate of the pyramid, so marvelous and successful in its mission, would in our day be a useless thing and its construction a folly. No necessity exists for any device to perpetuate the wisdom of our age; its existence becomes at once a fixed fact, and all we know and can acquire must be just as well known to the whole world 4000 years hence as it is known to us, with all the accumulating wisdom and knowledge of the intervening ages. The only sufficient answer that can be given to Mr. Dow's question is that nothing in the wide world can be devised to conceal the records of our times nor even to aid in their preservation beyond the prerogatives of the current civilization. The arts and appliances in common use are ample for the purpose. No earthly power can prevent their perpetuation to the latest generation or period of time. The pyramid has done its work—be it ours to appreciate and profit by its teachings.

A. M. SEARLES.

May, 1883.

METRIC ANALOGUES.—*Continued.*

Fòrmerly the Chinese li seems to have been more nearly related to the Arabian, *i. e.* three-tenths of the Arabian mile. Their collection of measures presents independent systems for different uses, without much attempt to consolidate them by forced adjustments. Their solid measures are clearly products of the Egyptian cubit, one-hundredth part of the agrarian schoenus.

The measures of length in Siam are very clearly related to the Arabian. The correlation, as quoted by Alexander, is

Length — 1 vouah = 2 ken = sok.

Itinerary — roëneng = 2000 vouah.

The ken is = 1.05097 yards; the vouah or fathom is then very closely half of Ezekiel's reed, or 3 great cubits; and the roëneng, as before intimated, = 1000 reeds.

The confusion that has prevailed with regard to the ancient stadium, or rather the different stadia, is explained by the fact that the Greeks, in appropriating the Mosaic (their Olympic) mile, marred its simple type by dividing it into 12 stadia instead of 10. The same thing was done with the Delphic or Pythian mile, and also with the Philetairic or Syrian, while their own military mile of 1000 paces (double-steps) was divi- into 8 stadia. In this way the olympic and military stadia were in fair agreement.

The Arabian mile is non-geographical; but its development, singly or in multiples, is of remarkable extent.

The statute mile of England and this country has the same defect, while strict analogues or multiples of it are comparatively rare. The mile of Livonia and that of Silesia are each very accurately 4 statute miles, and the mile of Lithuania, 5. For ethnological reasons, it is difficult to understand the relationship, unless it be that they had a common origin in the survey of Eratosthenes, 250,000 stadia to the circumference of the earth.

The modern geographic mile has the defect of being founded

on an impure division of the circle—that of Babylon. It lacks the simplicity of the Egyptian, Persian and Mosaic itineraries, and is vastly inferior to that or the Turks, which, in its amended form (mean mile = 1824 yards = 3000 Mosaic cubits,) presents the nearest approach to logical perfection of them all.

In the subjoined compilation, a number of dimensions are placed in correlation with the Turkish mile (it being first on the list), which by reason of coincident points in the different methods of dividing the circle, might with equal propriety, have been assigned elsewhere. Several are repeated, also, in different connections; and to make the quotations more complete, in some instances the same dimensions occur more than once, with slight variations, from different authorities. It is thought that this may tend to clear up, rather than to obscure the view.

The fractional relations which appear seem to be mainly due to the splitting up of the leading divisions of the circle, according to various fancies, by other divisors than 10. Slight excesses or deficiencies in correlation are indicated by algebraic signs. On the whole the correlations are much more exact than could have been expected, when we take into account what the vicissitudes of the people have been, and the slumber of Minerva for a thousand years after the fall of the Roman empire.

The different systems of correlation are convertible by the following key: Taking the agrarian schœnus of Egypt as = 145.92 english feet, their cubit at its one-hundredth part, and their fathom, 3 cubits; also, the Mosaic cubit at one eightieth of the schœnus, and the Hebrew fathom, 4 Mosaic cubits; also, the Turkish fathom as = 3 Mosaic cubits; with the stadium= 100 fathoms, and the mile 10 stadia in each case; with the Turkish mile as a standard of comparison; we have,

Turkish mile = 3000 Mosaic cubits= 1824 yards.

Mosaic mile = 4000 Mosaic cubits=2432 yards = $\frac{4}{3}$ of Turkish.

Egyptian " = 3000 Egyptian " = 1459 $\frac{2}{10}$ yds. = $\frac{4}{5}$ "

Also:

Modern geographic mile, adjusted to mean

circumference = $2026\frac{2}{3}$ yards = $\frac{10}{9}$ of Turkish.

Kilomètre, adjusted to mean

circumference = $1094\frac{4}{10}$ yards = $\frac{6}{10}$ of Turkish.

Arabian mile = 2046 yards = $\frac{2146}{1824}$ or $\frac{1073}{912}$ of Turkish.

ITINERARIES—CORRELATIVE WITH THE TURKISH MILE. METRIC MILE (TURKISH MILE ADJUSTED), = 1824 YARDS = 2624 METRIC CUBITS.

Name.	*Locality.*	*Authority.*	*Value, English Measure.*	*Turkish Miles.*
Berri	Constantinople	Alexander	1.0358 miles	1 —
Berri	Turkey	Haswell	1828 yards	1 +
Berri	Turkey	Byrne	1826 yards	1 +
Dolichos; Philetairic or Syrian	Anc. Greeks	Alexander	1.5781 miles	1½+
Estadio; ⅛ of Mitha	Portugal	Alexander	0.1594 miles	5-32+
Furlong	Ireland	Alexander	0.1500 miles	15-100—
League; common	Spain	Byrne	7416 yards	4 +
League; legal	Spain	Haswell	4638 yards	2½+
Legua	Mexico	Haswell	4638 yards	2½+
Li; new	China	Alexander	0.3458 miles	⅓+
Li	China	Haswell	608½ yards	⅓+
Lieue	Flanders	Alexander	3.9005 miles	3¾+
Lieue; modern	France	Alexander	3.1069 miles	3 +
Meile	Anspach	Alexander	5.3652 miles	5 +
Meile	Bremen	Haswell	6865 yards	3¾+
Meile; post	Dresden	Haswell	7432 yards	4 +
Meile	Flanders	Byrne	6869 yards	3¾+
Meile	Hanover	Alexander	6.3779 miles	6 +
Meile	Hungary	Alexander	5.1925 miles	5 +
Meile	Hungary	Haswell	9139 yards	5 +
Meile	Hungary	Byrne	9113 yards	5 —
Meile; poste	Leipsic	Haswell	7432 yards	4 +
Meile	Livonia	Alexander	4.0622 miles	4 —
Meile	Oldenburg	Alexander	6.1346 miles	6 —
Meile; since 1819	Poland	Alexander	5.3031 miles	5 +
Meile; poste	Saxony	Alexander	4.2220 miles	4 +
Meile poste	Saxony	Haswell	7432 yards	4 +
Meile	Silesia	Haswell	4.0260 miles	4 —
Meile	Turin	Alexander	1.5774 miles	1½+
Miglio	Florence	Haswell	1809 yards	1 —
Miglio	Leghorn	Haswell	1809 yards	1 —
Miglio	Tuscany	Alexander	1.0276 miles	1 —
Miglio	Tuscany	Haswell	1809 yards	1 —
Mile	Ireland	Alexander	1.2727 miles	1¼—
Mile	Switzerland	Byrne	9153 yards	5 +
Milha	Portugal	Alexander	1.2788 miles	1¼—
Milla	Rome	Haswell	1522 yards	5-6 +
Milla	Spain	Alexander	0.8648 miles	5-6 —

Name.	*Locality.*	*Authority.*	*Value, English Measure.*	*Turkish Miles.*
Mitha	Portugal	Haswell	2250 yards	1¼ —
Parasang	Anc. Persians	Alexander	4.1468 miles	4 +
Parasang; 3 Jewish miles	Ancient	Richard, Lord Bishop of Peterborough	7296 yards	4
Parasang	Persia & Turkey	Alexander	3.11 miles	3 +
Shœnus; great	Ancient	Richard, Lord Bishop of Peterborough	14592 yards	8
Schoina; (the parasang)	Anc. Egyptian	Alexander	4.1468 miles	4 +
Stathmos	Anc. Greeks	Alexander	8.2936 miles	8 +
To; modern	China	Alexander	250 li of 1826 feet	83⅓ +
Stadion	Anc. Greeks	Alexander	0.1316 miles	⅛ +

ITINERARIES—CORRELATIVE WITH JEWISH MILE. JEWISH MILE = 2432 YARDS = $\frac{4}{3}$ METRIC MILE.

Name	*Locality.*	*Authority.*	*Value, English Measure.*	*Jewish Miles.*
Asparez; less	Anc. Armenian	Alexander	0.1342 miles	1-10—
Dam	An-nam	Alexander	0.5523 miles	4-10—
Derech-yom; day's-journey	Anc. Hebrews	Alexander	16.9540 miles	12 +
Diaulos	Anc. Greeks	Alexander	0.2299 miles	1-6—
Dilochos	Anc. Greeks	Alexander	1.3792 miles	1 —
Dolichos; Olympic	Anc. Greeks	Alexander	1.3792 miles	1 —
Furlong	Scotland	Alexander	0.1409 miles	1-10—
Hamma	Anc. Greeks	Alexander	0.0115 miles	1-120—
Hardary	Mysore	Alexander	2.7344 miles	2 —
League; common	France	Byrne	4867 yards	2 +
Leuga	Anc. Gauls	Alexander	1.3788 miles	1 —
Liene	France	Alexander	2.7617 miles	2 —
Ly	An-nam	Alexander	0.2762 miles	2-10—
Meile	Baden	Alexander	5.5234 miles	4 —
Meile	Brunswic	Alexander	6.7520 miles	5 —
Meile	Lithuania	Haswell	9781 yards	4 +
Meile; polizei-meile	Saxony	Alexander	5.6234 miles	4 +
Miglio	Sardinia	Haswell	2435 yards	1 +
Mil; of Norway	Sweden	Alexander	6.9216 miles	5 +
Mile	Norway	Haswell	12182 yards	5 +
Mile	Scotland	Alexander	1.1272 miles	8-10 +
Mile	Scotland	Byrne	1904 yards	8-10—
Mile	Venice	Haswell	1900 yards	8-10—
Sabbath day's journey	Anc. Hebrews	Haswell	3648 feet	½
Sabbath day's journey	Anc. Hebrews	Alexander	0.5432 miles	4—
Schœnus; great	Ancient	Comp. Turkish & Egyptian		6
Schoina	Anc. Egyptian			3
Stadion; olympic	Anc. Greeks	Alexander	0.1149 miles	1-12 +
Stadium	Anc. Romans	Alexander	0.1149 miles	1-12—

Name.	*Locality.*	*Authority.*	*Value, English Measure.*	*Jewish Miles.*
Stathmos	Anc. Greeks	Alexander	8.2936 miles	6 +
Stunden	Baden	Haswell	4860 yards	2 —
To; modern	China	Alexander	{ 250 li of 1826 feet }	62½ +

ITINERARIES—CORRELATIVE WITH EGYPTIAN MILE. EGYPTIAN MILE = 3000 EGYPTIAN CUBITS = $1459\frac{2}{10}$ yards = $\frac{4}{5}$ of METRIC MILE.

Name.	*Locality.*	*Authority.*	*Value, English Measure.*	*Egyptian Miles.*
Meile.....	Brunswick	Haswell	11816 yards	8 +
Meile.....	Lithuania	Alexander	4.9958 miles	6 +
Mil.....	Sweden	Alexander	6.6235 miles	8 —
Mile	Hanover	Byrne	11559 yards	8 —
Mile	Sweden	Byrne	11700 yards	8 +
Mile	Sweden	Haswell	11660 yards	8 —
Schœnus; great.....	Ancient	} Comp. Turkish & Jewish }		10
Schoina.....	Anc. Egyntian			5 +
Verst.....	Russia	Alexander	0.6631 miles	8-10—
Verst.....	Russia	Haswell	1166 7-10 yards	3-10—
Verst.....	Russia	Byrne	1167 yards	8-10—

ITINERARIES — CORRELATIVE WITH MODERN GEOGRAPHIC MILE. GEOGRAPHIC MILE (ADJUSTED TO MEAN CIRCUMFERENCE), = 2026⅔ YARDS = $\frac{10}{9}$ OF METRIC MILE.

Name.	*Locality.*	*Authority.*	*Value, English Measure.*	*Geogr. Miles.*
Asparez; greater.....	Anc. Armenians	Alexander	0.1918 miles	⅙—
Dolichos; Delphic.....	Anc. Greeks	Alexander	1.1049 miles	.96—
Hippicon	Anc. Greeks	Alexander	0.4597 miles	4-10—
Kalamos	Anc. Greeks	Alexander	0.0019 miles	1-600—
League; 16 to 1 degree.....	Bohemia	Haswell	7587 yards	3¾—
League; 18 to 1 degree....	Brazil	Haswell	6760 yards	3⅓—
League; marine.....	France	Byrne	6075 yards	3 —
League	Portugal	Byrne	6750 yards	3⅓ +
League; common	Spain	Haswell	6026 yards	3 —
Legoa	Brazil	Alexander	3.8365 miles	3⅓—
Legoa.....	Portugal	Alexander	3.8365 miles	3⅓—
Legoa; marine.....	Portugal	Alexander	3.4521 miles	3 —
Liéue; old measure.....	Brabant	Alexander	3.4522 miles	3 —
Lieue; marine.....	France	Alexander	3.4522 miles	3 —
Meile; marine.....	Austria	Alexander	1.1507 miles	1 —
Meile.....	Bavaria	Alexander	4.6143 miles	4 +
Meile	Belgium	Alexander	3.4528 miles	3 —
Meile; less	Bohemia	Alexander	4,2938 miles	3¾—
Meile; greater.....	Bohemia	Alexander	5.7547 miles	5 —
Meile.....	Brunswic	Alexander	6.7520 miles	6 —
Meile; 15 to 1 degree	Germany	Haswell	8101 yards	4 —
Meile.....	Hanover	Haswell	8114 yards	4 +
Meile; marine.....	Lübec	Alexander	1.1520 miles	1 +

Name.	*Locality.*	*Authority.*	*Value, English measure.*	*Geogr. Miles.*
Meile ; geographic.....	Poland	Alexander	4.6038 miles	4 —
Meile.....	Prussia	Alexander	4.6038 miles	4 —
Meile.....	Würtemburg	Alexander	4.6028 miles	4 —
Miglio	Milan	Alexander	1.1536 miles	1 +
Miglio	Naples	Alexander	1.1593 miles	1 +
Miglio	Naples	Haswell	2025 yards	1 —
Miglio	Venice	Alexandér	1.1397 miles	1 —
Miglio	Rome	Alexander	0.9252 miles	8-10+
Mijl ; marine	Holland	Alexander	3.4521 miles	3 —
Mile	Bohemia	Byrne	10137 yards	5 +
Mile ; geographical.....	England	Byrne	2025 yards	1 —
Mile ; marine	Great Britain	Alexander	1.1428 miles	1 —
Mile ; long	Germany	Byrne	10126 yards	5 —
Mile	Ireland	Byrne	3038 yards	1½—
Mile	Italy	Haswell	2025 yards	1 —
Mile ; long	Poland	Haswell	8100 yards	4 —
Mile ; long	Poland	Byrne	8101 yards	4 —
Mile	Rome	Byrne	2025 yards	1 —
Mile.....	Rome	Haswell	2025 yards	1 —
Milha ; marine	Portugal	Alexander	1.1507 miles	1 —
Milla.....	Spain	Alexander	0.8648 miles	¾ +
Milla ; marine.....	Spain	Alexander	1.1530 miles	1 +
Mille.....	France & Belgium	Alexander	1.1507 miles	1 —
Milliarium	Anc. Romans	Alexander	0.9152 miles	8-10—
Parasang ; modern.....	Persia	Haswell	6076 yards	3 —
Parasang ; modern.....	Persia	Byrne	6086 yards	3 +
Stadion ; Delphic or Pythian	Anc. Greeks	Alexander	0.0921 yards	8-100—

ITINERARIES—CORRELATIVE WITH KILOMETRE. KILOMETRE (ADJUSTED TO MEAN CIRCUMFERENCE) = $1094\frac{4}{10}$ YARDS = $\frac{6}{10}$ OF METRIC MILE.

Name.	*Locality.*	*Authority.*	*Value, English Measure.*	*Kilometres.*
Kilometre	Belgium	Haswell	1093.63 yards	1
Kilometer	France	Haswell	1093.6 yards	1
Kilometre	Rome	Haswell	1093.63 yards	1
Lieue ; modern.....	France	Alexander	3.1069 miles	5
Mijl ; legal.....	Netherlands	Alexander	0.6214 miles	1
Mijl	Holland	Alexander	0.6214 miles	1
Mijle	Flanders	Haswell	1093.63 yards	1
Miglio ; since 1808.....	Austr. Lombardy	Alexander	0,6214 miles	1
Miglio	Milan	Haswell	1093.63 yards	1
Mile	Netherlands	Byrne	1093. yards	1
Mille ; metrical	France	Alexander	0.6214 miles	1
Stadium ; modern	Greece	Haswell	1083.33 yards	1 —

ITINERARIES—CORRELATIVE WITH ARABIAN MILE. ARABIAN MILE = 2156 YARDS = 1.1765 METRIC MILES.

Name.	*Locality.*	*Authority.*	*Value, English Measure.*	*Arabian Miles.*
Coss	Calcutta	Alexander	1.2772 miles	1 +
Coss	Calcutta	Haswell	2160 yards	1 +
Coss	Seringapatan	Alexander	3.6468 miles	3 —
Dain	Birmah	Haswell	4277 yards	2 —
Dain	Rangoon	Alexander	2.4306 miles	2 —
Gavada	Mysore	Alexander	14.5833 miles	12 —
Jod	Siam	Alexander	0.0956 miles	8.100—
Kibrath-aretz	Anc. Hebrews	Alexander	2.4220 miles	2 —
League; post	France	Byrne	4264 yards	2 —
Lieue; de poste	France	Alexander	2.4222 miles	2 —
Li; old	China	Alexander	0.3594 miles	3-10—
Li	China	Byrne	629 yards	3-10—
Meile	Austria	Alexander	4.7141 miles	4 —
Meile	Austria	Haswell	8297 yards	4 —
Meile	Belgium	Haswell	2132 yards	1 —
Meile	Hamburg	Haswell	8238 yards	4 —
Meile	Hamburg	Alexander	4.6803 miles	4 —
Meile	Holstein	Alexander	4.6806 miles	4 —
Meile	Mecklenburg	Alexander	4.6806 miles	4 —
Meile	Mecklenburg	Haswell	8238 yards	4 —
Meile; since 1810	Prussia	Alexander	4.6806 miles	4 —
Meile	Switzerland	Haswell	8548 yards	4 —
Miil	Denmark	Haswell	8238 yards	4 —
Miil	Denmark	Alexander	4.68 miles	4 —
Mijl; old measure	Holland	Alexander	3.6394 miles	3 —
Mile	Arabia	Haswell	2146 yards	1
Mile	Arabia	Byrne	2148 yards	1 +
Mile	Denmark	Byrne	8224 yards	4 —
Mile; post	Genoa	Haswell	8527 yards	4 —
Mile	Hamburg	Byrne	8244 yards	4 —
Mile	Holland	Byrne	6395 yards	3 —
Mile	Mocha	Haswell	2146 yards	1
Mile	Prussia	Byrne	8468 yards	4 —
Mile; post	Prussia	Haswell	8238 yards	4 —
Mille; old measure.	France	Alexander	1.2111 miles	1 —
Roëneng	Siam	Alexander	2.3886 miles	2 —
Roëneng	Siam	Byrne	4333 yards	2 +

ITINERARIES — MISCELLANEOUS. STATUTE MILE = 0.96491 METRIC MILES OF 1824 YARDS.

Name.	*Locality.*	*Authority.*	*Value, English Measure.*
Coss	Bengal	Haswell	2000 yards
Miglio	Venice	Haswell	1900 yards
Mile	Anc. Grecian	Haswell	4835 feet
Mile	Anc. Roman	Haswell	4832 feet
Stadium	Anc. Grecian	Haswell	604 3-8 feet
Statute mile	Gt. Britain; U. S.	Haswell	1760 yards

JACOB M. CLARK.

THE CAPSTONE.

That there is a consummate scheme of courses in the architecture of the Great Pyramid there can be no doubt. This is made manifest by the most cursory examination of its geometrical plan as given by Prof. Piazzi Smith in plates VII, VIII, and XIX of Our Inheritance. The location of the chamber 25 upon the 25th course, of that of 50 upon the 50th course; the marking of the 35th tier by the year and π reference; and the placing of the subterranean chamber at its special distance below the foundation, all these facts and others convince us that whatever the scheme may be, it is a very perfect and intimate one, and that when fully rediscovered it will be seen to possess many of the most intrinsic beauties of the whole structure. From an examination of the best works and diagrams there seem to be now exactly 210 courses with 20 feet removed. The last 10 courses occupy exactly 15 feet, and are at an average of 18″ each. Now allowing one capstone of large dimensions and 11 more courses to the 20 missing feet, we shall have the whole building to consist of 221 courses + 1 capstone. The 11 missing courses were probably of very similar dimensions to the upper 10 courses now *in situ*. Let us suppose that 9 of these courses were like those below of 18″ height and that the remaining two were of 14″ height. Then $9 \times 18'' = 162''$, and $2 \times 14'' = 28''$, and $162'' + 28'' = 190''$. Now 20 feet = 240″, and 240″ — 190′ leaves 50″ for the height of the "capstone."

There are many things, in the language of the ancient Cabala, concerning this scheme which demand our attention, as upon us devolves the lofty task of renewing the ancient landmark of Egypt and the world. Let us review a few of them, for they concern us both as pyramid students and as sons of Joseph.

In the science of mystic numbers* 2 denotes "assurance" or "certainty," 3 that of "essential perfection," 6 that of "secular perfection or completion," 7 that of "spiritual perfection," 5 is the number of "sacred order," 50 is the grand jubilee number, etc. When squared each of these

* See Palmoni and Mystic Numbers by Dr. Milo Mahan.

numbers is *intensified* in its significance, and when factored with each other a combination of import is the result. These numbers are also frequently found added together *polynomially*, as it were, and for special purposes of significance.

Viewed then in the light of the inch as a unit the terminating courses of this wonderful monument are very expressive. For instance, $18'' = 3 \times 3 \times 2$, *i. e. intensified* ($3 \times 3$) "essential perfection," "assured" (2). $14'' = 7 \times 2 =$ "spiritual perfection" (7), at last closing all human work and making it (the pyramid below) ready for its precious and elect chief corner stone of the perfect jubilee (50) number. This number 7 is also factored by 2, the number of "certainty." Polynomially $14 = 7 + 7$, just as $18 = 9 + 9 = 6 + 6 + 6 = 3 + 3 + 3 + 3 + 3 + 3$, in all of which forms these numbers are equally and similarly expressive.

221, being the number of the courses in the human part of the edifice equals 17×13, two most expressive Manassehite numbers. To go into all of their deep significance here would be to crowd every other article out of this magazine for a year. I shall merely attend to a few of them.

Manasseh, the eldest son of Joseph, was placed after Ephraim by Jacob when he adopted them as his own children, and thus Manasseh became the thirteenth tribe of thirteen-tribed Israel. The number 13 is the number of Anglo Saxon "fullness," to wit—the "baker's dozen," the ancient jury—the present military court-martial thence derived, etc. It is also the number of revolution from that which tyrannizes, and of regeneration, rebirth, etc. Concerning it Dr. Mahan's whole labor upon the Mystic Numbers is a continued and unexhausted theme. It is an intensely Anglo-Saxon, American, Biblical, Manassehite, Pyramidal and cosmical number.

The number 17 is equally expressive. Mahan tersely puts it as the number of "God's people," being 10 of the commandment + 7 of the spirit. Now the motto "*novus ordo seclorum*" under the pyramid upon the reverse of our national seal has just seventeen letters in it. So MDCCLXXVI = 1776 placed upon the base of the pyramid is made up of $1700 = 10 \times 10 \times 10 + 7 \times 10 \times 10$, *i. e.*, the century number and

$7 + 6 = 13$ the national number. Let it now be noted that 1776 marks the beginning of the "*novus ordo seclorum.*" The number 1776 is in itself a peculiarly marked one, to wit: $1776 = 1 + 7 + 7 + 6 = 21$, the number of maturity, and $21 = 7 \times 3$. These are the numbers of essential and spiritual perfection combined. But 3 is the first of the polygonal numbers of the triangular order, and is an emblem of the pyramid itself, and of its capstone, hence $3 \times 7 = 21$ = the number significant of the most perfect of all pyramids, namely that one which aspiring heavenward like that of Manasseh shall be capped at last by Him who "prospered our beginnings."* Again $1776 = 888 \times 2 = 111 \times 2 \times 2 \times 2 \times 2$. All of these numbers are intensely appropriate and significant. Mahan remarks of them as follows: "It is curious that the Christian era date gives the condition on which alone human liberty can be achieved; 1776 is twice 888, or eight times 222, numbers of Jesus and of the Incarnation, 'if the son shall make you free, ye shall be free indeed.'" "1776 is in years of the world (A. M.) a number which occurs in very striking connection, and may be interpreted as the 50 of jubilee or deliverance and the 9 of humanity."† In its second arrangement of $1776 = 111 \times 2 \times 2 \times 2 \times 2$, we have the idea beautifully brought out. "111 is the number of that expressive phrase in Hosea 1: 10, 'sons of the living God,' namely those who are gathered together in one,'" ("E pluribus unum",) "in the body of Christ." In our national date this factor (111) is intensified by a quadruple ($2 \times 2 \times 2 \times 2$) amount of certainty. Again, in summing up the expressive numeral letters in the Hebrew expression, "and God saw the light that it was good, and God divided the light from the darkness," we obtain 1776, the same number that expresses the date A. D. when the light of perfect human liberty was separated from the darkness of oppression. Finally with reference to 1776, this date $= 13 + 17 + 8 + 8 = 13 + 17 + 2 + 2 + 2 + 8$, *i. e.* the national and pyramid

* "Annuit Cœptis."

†Two of the most critical dates in American history, 1765 and 1778, are in years of the world multiples of 13, and even as they stand they are so in their final term, $65 = 5 \times 13$ and $78 = 6 \times 13$—Mahan.

numbers 13 and 17 assured (2) + the 8 (=1 + 7) of a new beginning—"*novus ordo seclorum.*"

Let us now return to a consideration of this motto. The sum of its expressive letters, V. D. C. L. M., in Roman numerals is 1655. Now this set of figures, taken as a date in the years of the world, 1655 A. M., marks the year when the eight souls, *i. e.*, a new beginning, including Noah, entered the ark, and from it begins not only a most momentous series of "new ages," but in it died Methuselah, the oldest representative of ages doomed to deluge. The number 120 is that of "the ark a-preparing" (Mahan); 20 + 1 = 121, is that of the ark prepared —the value of unity (1) added being (Mahan) to signify accomplishment. Now 1655 + 121 = 1776. Read in this connection Psalm 121.

Furthermore, 1655, A. D., is the central year of Oliver Cromwell, the first protector or president, in whom Manasseh as a democratic and disturbing element in Ephraim first becomes fully manifested. For 120 years thereafter the ark was a-preparing, in one year more it was prepared, and thus in 1776, A. D., floated into new seas, new ages and new scenes, and Manasseh began to forget "all his toils and all his father's house."* 1655, A. M., = 2349, B. C., hence 1655, A. D., = 4004 years after the deluge. In other words the same era extends from the dawn of creation to the manifestation of Him from whom all spiritual light descends, as there does from the deluge to the manifestation of Manasseh, "the great people," in whom the light of human liberty is shed around the earth. 4004 = (2002) 2 = (1001) 2 × 2 = (10 × 10 × 10, or the law (10) cubed, *i. e.*, intensified + 1 accomplished) × 2 × 2, *i. e.*, assured and made certain.

Again considered with reference to Ephraim, the number of whose name is 331, 1655 = 331 × 5, *i. e.*, it is perfect and complete, without a remainder and marks a closing epoch in his history. With reference to Manasseh 395, 1655 = 395 × 4 + 75, *i. e.*, Manasseh assured + 75. 75 is the most expressive of all the prophetic times; it is the duration of the final epoch, or closing "day of grace" with which the latter days are to

* See Gen. XLI., 50–52.

terminate. Factored it is $5 \times 5 \times 3$, the sum of whose digits is 13. In its factors it reads "essential order, 5," "intensified, 5×5," and "essentially completed, 3."

Before turning to other subjects let us note that 1776 A. D., in years of the world = 5780 A. M., and $5780 = (222 \times 2)\ 13 + 2 + 2 + 2$, or $= (111 \times 2 \times 2)\ 13 + 2 \times 2 \times 2$, a repetition of the same marked numbers we have been discussing above.

With this brief introduction we are now ready to return to our consideration of the pyramid's courses and capstone. We have already seen that there can be little doubt but that it originally contained $221 = 13 \times 17$ courses + a chief corner or capstone in which the whole building was fitly joined together; 221 may be interpreted the sons of God (17), regenerated (13), but by the addition of Him who preeminently was the very Son of God we have the great temple a completed structure of 222 layers; 222 is the most expressive factor that we have noticed in the preceding pages, and is made up of 111 = the sons of the living God, by the 2 of certainty.

One of the most sarcastic objections made by opponents of the pyramid theory is that it is absurd to believe that a monument can possibly be of inspired import, to understand which men have had to tear it to pieces. But this is a very short-sighted objection. That monstrous mass of masonry cannot be much further mutilated, and to the extent that it has been it was manifestly intended to be, because it was only by pulling out its passage plugs that we were enabled to penetrate into its interior. It was only by removing its casing stones that its entrance, the scheme of its courses, its chamber elevations, and Pleiadic, π, and year references were made known. It was in the same way that its socket corners were proved with all their mystic import. Moreover all this destruction has begotten for us a renewal of the true principles of pyramid construction; it has created a school of students whose discoveries are destined to replace the earth in possession of the very talisman of liberty—just weights and measures—just because perfect, and perfect because in accordance with the eternal nature of the universe. It is only by tearing to pieces the human body itself that we have learned to mend it, and to know how

fearfully and wonderfully we are made. The pyramid is not destroyed. It has within its sacred precincts chambers and passages yet undiscovered, whose treasures never have been violated by sacrilegious sight since the day of their concealment. They are the counterpart of those which ignorance has profaned. In their day they will be duly discovered. The pyramid will certainly be rebuilt. To accomplish this task correctly is the object of the lesson we, as students of its mysteries, are learning to-day. The searching fire, through which every new discovery is made to pass, is proof that men are now studying the science of pyramidal architecture for some great purpose. The day will come when Manasseh, alone, single handed, if need be, will renew the noble monument which stands at the centre and the border of the land of his birth, and the ideal emblem of which he already has upon his seal and in the spirit of his government.

Let us now examine the proportions of the capstone, with a height equal to 50, the number of jubilee and eternal deliverance, and also one of the most expressive of all the pyramid numbers. I shall have to be very brief in my notes upon the dimensions and proportions of the capstone. In the first place the capstone is in itself both a casing stone and a final course. The height 50″ gives to it a most astonishing sequence of dimensions. Since the capstone is a model of the pyramid it crowns, we have then as follows:

Height $= 2 \times 25'' = 50''$.

Perimeter of base $= 100\pi$.

Side of base $= 25\pi$.

Diagonal base $= 25\pi\sqrt{2}$.

Sum of diagonals of base $= 50\pi\sqrt{2}$.

Apothegm of capstone $= \frac{17}{21} 25\pi$

Arris line capstone $= 25\sqrt{\frac{8+\pi^2}{2}}$

Sum of the four arris lines $= 100\sqrt{\frac{8+\pi^2}{2}}$

Sum of all its edges $= 100\left(\pi + \sqrt{\frac{8+\pi}{2}}\right)$

Area of base $= (25)^2 \pi^2 = 625\pi^2$

Area of vert. merid. sec. $= (25)^2 \pi = 625\pi$.

Area of diag. vert. sec. $(25)^2 \pi \sqrt{2}$

Area of face $= \frac{1}{4} \cdot \frac{34}{21} \cdot (25)^2\pi^2$

Area of all faces $= \frac{34}{21} (25)^2 \pi^2 = \frac{2 \times 17}{3 \times 7} (25)^2 \pi^2$

Area of entire surface $\frac{55}{21} (25)^2 \pi^2 = \frac{5 \times 11}{3 \times 7} (25)^2 \pi^2$

Area of circle on height as diameter $= (25)^2 \pi$

Circumference of latter circle $= 2 \times 25 \pi = 50\pi$

Area of circle with height as radius $= 2500\pi$

Diameter of latter circle $= 100$.

Side of square whose area equals merid. sec. $= 25 \sqrt{\pi}$.

Perimeter of latter square $= 100\sqrt{\pi}$.

Diagonal of latter square $= 25 \sqrt{2\pi}$.

Sum of diagonals of latter square $= 2 \times 25 \sqrt{2.\pi}$.

Radius of circle whose area equals base $= 25\sqrt{\pi}$.

Circumference of latter circle $= 2\pi .25 \sqrt{\pi} = 50\pi \sqrt{\pi}$.

Side of square whose area equals the circular area with height as radius $= 50 \sqrt{\pi}$.

Perimeter of latter square $= 200 \sqrt{\pi}$.

Diagonal of latter square $= 50 \sqrt{2} \sqrt{\pi} = 2 \times 25 \sqrt{2 \times \pi}$.

Sum of diagonals of latter square $= 100 \sqrt{2\pi}$.

Volume of cap stone $= \frac{2}{3} \pi^2 (25)^3$.

Volume of prism with same base and height $= 2.\pi^2 (25)^3$.

Volume of cube with face equal to base $= (25)^3 \pi^3$.

Volume of cube of height $= (50)^3$.

We shall extend this table no further at present, since it must be manifest that in a capstone of 50″ height the whole beauty of the π-proportions becomes intensely manifested.

We recommend to pyramid students, however, the earnest investigation of all the properties and proportions of this "chief corner-stone," as from them may be derived, in their simplest terms all the formulæ involved in the general architecture of the pyramid. For example, since 25 is a common factor to all the capstone properties, and since, in terms of the analytical unit

$A = 57.2957795+$ etc., $25 = \frac{25.\pi.A}{180}$, it follows that they may all be formulated with reference to A.

So, too, they may all be formulated in terms of $G = 103.132350055501 +$ &c. For as $G = \frac{(3)^2}{5} A$, whatever may be formulated in terms of A, can likewise be so formulated with reference to G. Furthermore, since $Y = 365.242 +$ &c. $= \frac{2(3)^2 A}{5} \sqrt{\pi}$ it follows that all the dimensions and properties of the capstone may be also formulated with reference thereto.

The above brief survey will suffice to show the importance of the height 50″ we have proposed for the "capstone" when the work of renewing this grandly mysterious building shall, in modern times be begun, and when it shall at last receive reparation at our hands for all the sacrilege it has endured in ages past.

There can be no mere "coincidence" in such facts as we have here adduced. The chances against the recurrence of the factors and components 111, 13, 17, 2, 222, etc., etc., in the pyramidal heraldry of Manasseh, and of their repetition in the Cabala, the pyramid, and in the national history of England and America would alone be expressed by unity followed by many lines of cyphers. The mind could barely grasp the general idea of such a number as would indicate the chances against these facts; and yet the facts exist, and every deeper study into these numerical harmonies reveals new facts *sui generis*. What then do these facts prove? They prove intention and design of the most extended scope, and consummately realized. Not half the laws of physics stand upon a better basis. The wise man sees in this great structure then a deep lesson for the human race, and bends himself to learn it, while the scoffer as in days that closed the olden ages, marries and is given in marriage to the follies doomed to everlasting deluge.

C. A. L. Totten, U. S. Army.

CONSERVATIVELY RADICAL.

The extremely conservative man believes in everything that is old, and his decision concerning what ought to be is determined by his investigation of what has been. To such a man the best possible treatise upon logic is a memorandum book. His old flint-lock musket is the most effective weapon imaginable, because his great grandfather used it, and every aged man he can remember has told him that old grandsir Jones used to be the best marksman in the colony.

On the other hand, the extreme radical despises all experience except his own, and has implicit trust in the divinity of his own intellect. Yet he is even more prejudiced in his opinions than his fossil opponent, for, while the latter respects the vast store of world experience, the extreme radical dictates untried schemes to the most profound statesman,—substitutes his own theories for those of the most learned scientist,—is not at all abashed to call in question the wisdom of the Almighty.

Probably our intellects are just about as strong and active and penetrative as were our fathers', and they at thirty, forty, fifty, sixty years of age, had accumulated just about as much of valuable experience as we have at their respective ages. Yet neither intellect nor experience is ever perfect, and we may doubly profit by the experience of the past; we may inherit its wisdom, and we may shun its folly; and having done our best we shall leave to our children a mixed inheritance. Yet may we hope that it shall be a little more of wisdom, and a little less of folly than was our patrimony, for the superstructure of our fathers became part of our foundation.

Let us remember that human life is not long enough to acquire all knowledge by individual research; that proficiency in knowledge, therefore, can only be attained by a wise acceptance of those principles which experience has already established; then, taking that as our starting point, we may "go on unto perfection."

The special investigations of our society will be of no avail

if we reject well established principles, and are continually allowing our fancy to run wild. Our useful work will be that, and only that, which is founded upon facts obtained by careful research, and is built up by arguments and demonstrations whose soundness has been tested. We must be conservatively radical if we would hope to overthrow error and establish truth.* J. H. Dow.

*NOTE.—While I believe that our hereditary weights and measures have a deep scientific and religious import which the Great Pyramid will reveal, I disbelieve much that is published upon the subject, and wish that articles designed for publication were subjected to a more careful scrutiny.

FULL TIMES.

God's times are all full times. "In the fullness of time Christ came."

1260 years is a full prophetic period.

365 years are a day for a year as counted in prophecy.

Last year when Mohammedan Egypt was conquered by Great Britain it was just 1260 years from the Mohammedan hegira, and just 365 years from the banishment of the Caliphs from Egypt, and the establishment of the Caliphate at Constantinople in Turkey.

"In that day (Isa. 19: 19,20), Egypt was promised a saviour and a great one" to deliver them (not the Saviour). Query, "Is Great Britain that saviour?"

The date of this event is 40½ centuries from the time when the Great Pyramid was founded. 40½ is the radius of the remarkable circle which has 81 for its diameter. That in the Great Pyramid the radius of a circle points to both the circle and its square, notice John Taylor's first discovery concerning the pyramid's vertical height. JAMES FRENCH.

LETTERS.

FORT ADAMS, R. I., May 2, 1883.

To the International Institute for Preserving Weights and Measures—

GENTLEMEN:

I have the honor to invite your attention for a few moments to a subject which I consider to be of the utmost importance, and one which it seems to me is vital to the healthy existence of this association. That to which I refer is the need of extreme care that this institution should exercise before it presumes to put itself on record. I do not refer to the papers or articles of the individual members published in our Magazine, reports, etc., but particularly to such acts and resolutions as are, and will hereafter be, considered as *ex cathedra*, the acts as such of the International Institute.

Before I enter more fully upon the subject let me ask you to remember that the avowed object of this association is first to preserve, and then, and not till then, to perfect Anglo-Saxon weights and measures.

It is one worthy of the hand and heart of every English-speaking man and woman upon the earth, and I doubt not that the day will dawn—and sooner than we dream—when men and women of every other tongue now spoken, will rejoice to see and come beneath the standard raised at Boston on the 8th of November, 1879. The Institute, although so young, has already done a great and noble work. It has gathered to its ranks an earnest band of able workers, and there are others hastening towards us who will join in time. But the Institute has far more yet to do, and daily, till the crisis comes, will it find its labors growing harder. The battle is not only to hold what we have, but to win the whole vantage ground back from our "metric" adversaries; and having once possessed ourselves of the field, to entrench and hedge it in forevermore.

We can only cultivate in peace what we shall gain in battle. We must, therefore, first win that peace, and with it win the right to clean, to plow, to harrow, and to plant. It is not until we have accomplished the first part of our task that we shall have any right to measure out the plots in inches and seed them down in grains.

In the sense in which the Institute is incorporated we have not yet accomplished the first part of our object, and we are in no way ready to decide upon the proper means of perfecting any one of our units.

Festina lente—GO SLOW. This is a motto now to be often repeated in our midst. It cannot be repeated too often, nor can it be followed in spirit and in practice too faithfully.

As a member of the Institute I earnestly protest against any present adoption of an absolute unit of length, capacity, or weight. There is ample time yet for such acts and resolutions, and I foresee that if the Institute acts in haste it will have to repent at leisure, and will probably have to reconsider and recant. The subject of the inch, grain, ounce, pint, and pound, has not yet been carefully enough considered for us to be sure of our judgment, and to feel safe in venturing to establish any one of them by a decided resolution. I speak this advisedly, having much knowledge upon some of these matters that I have not yet been able to put before the Institute.

This knowledge is of such a nature as not only to be quite new in its metrological bearing upon both the pyramid and Anglo-Saxon systems, but to be at considerable variance with the facts that have hitherto been most forcibly laid before our Institute and with which it now seems to be most favorably impressed.

From long and interested familiarity with the whole library of pyramid literature, and from a full acquaintance with the work already done by our own Institute, I am satisfied

that there are not yet data enough collected, and at our command at this moment, upon which to say internationally and for all time what the value of a "grain" shall be.

At the last meeting of this Institute, held Wednesday, April 25th, as reported in the *Plain Dealer*, I notice that it was decided to settle the question of the "unit of weight," and the advisability of making it the "grain" at the next meeting, that is to-night. [Lt. Totten was misled—such was not the purpose of the Institute.—ED.]

Can it be that this Institute is ready even for a trial vote upon this momentous question? Upon what "grain" shall we agree? The ancient Anglo-Saxon grain? the later "grain of a few hundred years ago? the present "artificial" Anglo-Saxon grain?—and if so which one, the British or American? and if the latter, why ?—or shall it be the "grain" somewhere now monumentalized at Gizeh. At the present state of our actual information we cannot say with certainty which of these varions modern attempts to recover the lost element is the nearest to the truth. Are we after accuracy in this matter? If so, then I for one am not ready to see this Institute acknowledge for the unit of weight a thing concerning which there shall be any doubt whatever, or one too small to be handled familiarly by both rich and poor, or too large to be so handled. It must be absolutely earth-commensuric from the primary standpoint of weight, secondarily from that of volume, and thirdly from that of length. It must have all these things and more that I need not mention here, and each one of them must be so thoroughly founded upon truth, sound reason, clear demonstration, and pure and simple mathematics, that we can easily recover it if lost, and prove that what we have recovered is the very thing we lost.

Have we, as an Institute, so fully satisfied our minds upon the relative values of all the diverse "grains" that the Anglo-Saxon has employed in his past history, and are we so confident that we understand the ancient monument at Gizeh so thoroughly, as to be able to say fearlessly that this or that "grain" is the true one, and is not only pyramidal but, still more, earth-commensuric? Most assuredly we are not, and cannot be. But just suppose for one moment that the Institute shall to-night pass an official and unqualified resolution that an amount of water of such and such a value, and under such and such circumstances, shall be the unit(?) of weight and shall be called a "grain." What will it have done? Why, simply nothing. Worse than nothing, if in its unit shall be found the slightest mathematical error, the smallest earth-uncommensurability, the least inconvenience attendant on its use, or if there can be raised against its employment a single sound objection.

It was over-haste that presided at the councils of the French philosophers when the metric system was evolved, and it is now too late for its adherents to repent. They, too, are as busy studying the problem of perfecting what they have as we are. Let us profit by their experience one hundred years ago, and go slower still.

Let us remember that we have a most beautiful system to work upon, and if we will with patience possess our souls and labor faithfully at the pyramid awhile longer, we shall surely rend from it its secrets.

The hitherto published proceedings of the Institute do not afford members distant from the central branch (Cleveland) any means of judging what may be the actual platform proposed for adoption. The impression to be gained, however, is that the present artificial Anglo-Saxon grain (at its American value) instead of being perfected back to its ancient cosmic and pyramidal value, is to be taken as it now stands—the purely accidental arbitrary legislation of an over hasty parliament—and made the grain of this Institute. This I pronounce as short-sighted, and if the Institute so acts it will make a most lamentable mistake. We are not ready to perfect the Anglo-Saxon weights, we have but just begun the battle to preserve them as they now stand. Let the various cases be produced, let them be carefully published, let them be matured, and criticised, and agreed on, and let the reasons be given, and be shown to be sound and universal ones, and of earth-commensuric import, and then, and only then, can we intelligently act, and not until they are

can this Institute as a body decide upon a single unit. Take, for instance, the grain—nothing is so sure as that its present value is not two hundred years old, and that it is by no means the ancient pyramid grain. Shall we then adopt it? If there is honest doubt upon the subject will not such an act be manifestly over-hasty. For one I have more than honest doubt, I have positive disbelief in the grain we are in danger of being committed to this evening. It is on that account only that I write thus anxiously in hopes you will delay your action—I wish you would delay it indefinitely—I think the matter ought to be laid on the table for an indefinite period. We can easily perfect our system, our terms, our multipliers, etc., without fixing upon the actual value of the grain. But if we fix upon the latter and make an error, our whole system will be vicious. At any rate let the action be at least delayed until I can produce my reasons for another grain and for a better unit and can show them to be founded upon the eternal nature of things, as pictured at the pyramid, but as existent in the world it represents.

But it is urged that "the origin of the present grain is cosmical, agreeing with seconds of the circle of 360° as does the inch," and hence that it must be true!

The conclusion, however, does not follow. What is there "cosmical" in the number 360 as such? It is a beautiful and convenient number, but wherein is it related to *weight?* Can any cosmical reason be given why the grain should agree with the inch and both with the circle, or what practical utility is to be subserved in a weight measure by such a relation? Even if such a relation be of any real (?) value as to the *lineal* unit, can the Institute give a solitary *practical* reason why it is at all desirable in one of weight? Will it assist us to handle it, to recover it, or to protect it? Is not this a practical question—this *value* of the *grain*? Should not a weight measure have relation rather to the earth as a thing of weight, and one of capacity to the earth as a thing of volume? And should not both be so correlated to all the elements of the planet upon which we live, to water as a unit, to all specific gravity as its multiple and to their resultant capacities as units rather than to any real or fancied circular relations?

The wonderful circular relations found in the Great Pyramid have served to call our attention to many cosmic truths which are just becoming known. And now that the very golden age of pyramid discovery is but truly *dawning* how can we dare to say we have already found out enough to base our units upon accuracy itself as monumentalized at Gizeh! Do we yet fully understand this wondrous monument? Let him who says he does go read in Job that answer from the whirlwind. No, my friends, we shall be too hasty if we engross to-night, or for many nights, any resolution tending to establish as our dictum that which *is* and should be everywhere acknowledged as the unit *value* of a grain. There is right here a question, too, of far more primary importance, namely, shall the *ounce* or grain be taken as the unit of weight. The unit must be a thing with which all men are familiar, and it is manifest at the outset that from this standpoint alone the *ounce* is the only suitable *unit*, and the grain a mere aliquot thereof. Of course, the grain must have a *constant* value, but that will not make it *per se* "*the unit.*" The "point" (1-72) and "line" (1-12) have constant values, but the "*inch*"—as was never doubted—is manifestly the only proper lineal unit. Its numerical expression and absolute earth reference may be still a matter of doubt among us. It is so, nevertheless it is the natural "unit," and the weight and capacity measures which most appropriately correspond thereto as "units" are undoubtedly not "grains" but "ounces." Such questions as this I can see no danger in settling, but values are for us as yet things that I conjure the Institute to handle lightly and eschew until established beyond doubt by cumulative proof. "Prove all things, and hold fast to that only which is good." I ask you to put what I shall submit in one or two meetings through the same rigid test you are now asked to focus upon everything that comes before you, and if it stands every test you bring to bear upon it, I shall ask you to go slow, and let it rest, for there is no hurry to adopt.

One of the chief objections to the French metric system is that having adopted a lineal

unit upon avowed, earth-commensuric principles, they were content to "halt," and found their units of volume and weight thereon, and thus establish it without any direct earth-weight and earth-volume connection. Hence their system only pretends to be of cosmic import lineally; and as we now well know is founded even then upon misconception and is calculated in error. But is not the Institute drifting towards just such a shoal in founding the unit of weight—be it ounce or grain—solely upon this circular, or linear fancy? Again, a great deal has lately been written to show that the present inch has been providentially preserved, so that it now lacks nothing of being the perfect linear unit. This is certainly a startling assertion, when we reflect that the statute inch of Great Britain is different from that of its fraternal Anglo-Saxon nation—the United States. In fact all British linear measures are shorter than those of the United States by about 1 part in 17230 (Trautwine). Which of these systems then has been so providentially preserved, and why this one or that one? Is it sufficient to answer this one or that one, simply because it happens to agree with a circular relation while the other does not? Is not such an answer absolutely without authority, and will not all of our opponents say we are playing with a grand subject if we can found our unit grain upon no better basis? Do we yet know to within 10,000 tons the present weight of the pyramid? Do we know to within 100 tons what was its ancient weight? How can we yet know it when its upper and concealed parts still remain so mysterious and unexplored? Is it not far more probable that if the monument as a whole, does actually yield in "grains" a perfect ratio, that this ratio must result from the consideration of many measurements not yet made—and from specific gravities of the whole made up from those of every component element? I tell you my friends we are not ready to determine the weight of the "grain." The pyramid is a monument that points us to the right way of determining these things, but we have not yet studied it sufficiently to know even faintly one tithe of what it teaches and was meant to teach. Not a week passes—the president of this Institute will support me in the statement, and your own fortnightly increased knowledge will support it further —but that many new and wondrous relations are pointed out, and I assure you until discoveries become fewer we may not dare to enter in upon the domain where some of our members desire so prematurely to urge us to the "charge."

Is the pyramid a grand metrological monument? Undoubtedly it is. But who yet can say he has solved its perfect scheme? And until we can all so say, and prove our statement true, what right have we to fix upon any value so important as the inch, the ounce, the "grain," the pint, and pound, and say we know its cosmical value, whereby it is related like a law of nature to the eternal constitution of things. My friends, I conjure you to go slow. As a private student of this monument I have studied it for years, and I say in all good faith, that the lines of investigation I have pursued have been on new paths, and paths that are leading to such grand metrological facts that in the light of them I dread to have the Institute unwarned take any step that I can clearly foresee will have to be retraced.

We have work enough before us to fully develop the pyramid and rebuild it upon paper before we may presume to rebuild it for practical use, and our knowledge upon its architecture is as yet entirely too imperfect to put its rudest templates up. Do you suppose a single stone of that great metrological monument was reared upon its everlasting site until the plans were all complete, and all drawn up, and proved to be harmonious in the office of its grand and mystic architect? And shall we who have not become satisfied, nor satisfied the world upon hardly a single feature of its harmony, we who absolutely do not know its geometric plan entire, commence to lay the founding of its modern renovation at this early date? No! let us not as an Institute do aught at present but collect material, study the pyramid, hear arguments, and keep alert and hostile to the metric system. Of its falsity we are sure since we can demonstrate it, and since the demonstration has already forced its advocates to endeavor to eliminate its errors. Let us therefore be care-

ful not to give the enemy of Anglo-Saxon measures and traditions any chance to catch the handle of this same weapon. We are now in the age of David—we are merely collecting gold and silver and precious things wherewith to build the temple. The age of Solomon has not arrived. No master hand has yet drawn upon the trestle-board of this great undertaking, even outlines, and shall we, as yet merely apprentices, be so premature as to decide upon sizes for the parts when yet we know not what shall be the great proportions of the edifice itself?

But further, a few hundred years ago, neither of the Anglo-Saxon inches was in agreement with its present statute value. When did Providence commence to preserve this standard? What shall we say then to our adversaries if we build our pyramid on such quicksands as these? Have not errors crept into the very word of God? and shall the inch have been more sacred than the word itself, or shall the grain have been so? Have we not found it necessary to revise the sacred book itself in order to clear it of errors that —in spite of Rev. XXII: 18-20—men have introduced, adding to and taking from it? Do not yet some others lurk upon its sacred pages? And shall the unit inch—that for thousands of years has not been lifted up against its ancient standard for correction—shall this little thing in daily use in hands of weak and wicked man miraculously not have lost some little by attrition and abrasion? I believe that all the demonstrations made by our able president, and by Mr. Dow, and Mr. Skinner, and by Mr. Searles in terms of this British inch are of immense value, and it is probably true that they establish important ratios and thus lead to an increasing number of cosmical truths locked up in the pyramid. I am ever ready to listen to the argument that they were locked up in order to be so read and read only in the unit which we actually use to-day. But when I cast my mind's eye over the pyramid idea, as it is now so grandly formulating itself before us all, and see its other harmonies that only come out in the cubit (25) and metronic (50) numbers, harmonies too so grandly earth-commensuric and universal and so practical that before them all mere circular relations are belittled, when I see these things I cannot restrain the fear that if we as an Institute do not keep calm we shall too soon adopt some sudden shadow while the true crystal proportions of the substance looms unseen above us. It must not be forgotten that from its very architectural nature, the pyramid must yield its ratios no matter what the unit or the standard by which we measure it—it yields them to the metre just as well as to the inch. There has not yet been enough work done upon the pyramid inch—the one-ten-millionth of the polar radius, and in terms of which so much of truly earth-commensuric and real practical import flashes from this monument—until there is this Institute will only venture at its peril to say aught upon the linear unit. Fight for the inch we use to-day, and continue to use it, work with it at the pyramid, but don't adopt it. Wait—go slow—for much depends upon it.

Since we know that the Bible has not been saved from the inroads of error, how shall we credit the statement that the inch and ounce have not in like manner suffered somewhat at the hands of time and faithless man? Why were the commands given "A perfect and just measure shalt thou have," and "Thou shalt not have double weights in thy balance," if it were impossible to alter the standard and the units given from above? No, there is not a measure now used upon earth that is perfect, but the Anglo-Saxon measures are more nearly so than any others. Yet are they—even they—not so exactly; and we cannot afford as an Institute, and after so little discussion thereupon, to fix upon any one of the present values of the linear weight or capacity units as innately true and in accordance with all nature and the universe, until we can establish them so by sound reasons, and as such by reasons sounder than any founded upon a mere circummetric relation.

Moreover the Institute as a body should vote upon this matter, and not any branch thereof, not even the central body, by proxy for the rest. Let it be remembered we are working for all nations and for all time—and that they are many, and that time is long

enough for us to wait. Let us make our progress (let it be how slow soever) certain and secure.

Festina lente means from another standpoint *Nulla vertigia retrorsum*; but if we make a hasty stride, it must be taken back, or men will pass us, and the work be taken from our hands. The question that it is proposed shall this night be decided is one upon which every duly elected member should be permitted to vote, and one upon which each member has a right to vote.

It is an easy matter to issue a circular containing a set of carefully drawn up questions for each member to fill out. It is even easier to print these questions in the July number of the International Standard to be answered at least two weeks after receipt. We shall thus submit them directly not only to our own members for a sort of trial vote as it were, but by this means many readers not members of the Institute may be induced to give their views thereon. Even then it will take until September to get the replies from some of the more distant members, and on this account it would perhaps be wise to give ourselves until September 30th, in order to get the sentiment of the whole Institute.

What we most need is a basis upon which to build securely. The pyramid is the emblem of stability, and it will not do to have a single weak line in the plan of that one which this Institute desires a world united to erect for all posterity.

Let us, then my fellow-workers in a cause that has so endless a future, and one that has patiently waited for our Institute four thousand years,—let us appreciate the fact that it can certainly wait if needs be, yet a few years more. The cause had far better wait indefinitely than by any hasty action in the house of its friends be prematurely launched, laden with regret, and upon a sea of doubt.

The sentiments I have now tried to convey are shared with me by the several members of the Institute in this vicinity. I regret that I am forced to write in such haste, but only a few days of grace intervene between the receipt here of the report of our Cleveland meeting and the closing of the last mail that reaches the next one. Though I have taken up considerable of your time to-night, I cannot but feel it has been spent in a most important consideration, and I only trust it will influence the Institute to avoid committing itself to any unit, or schemes of units, values, or systems of measures, etc., until satisfied they rest on practical, convenient, readily obtained, familiar, and earth-commensuric facts.

In closing, I will here submit a few questions such as should certainly be asked of every member.

It is certain we cannot intelligently vote upon the adoption of any unit of international import until we can answer clearly and fully the first six of the questions given.

QUESTIONS.

(1.) Do you believe that the perfect scheme upon which the Great Pyramid, as a metrological monument was originally built, has yet been so far discovered as to enable us intelligently to rebuild it with every part in harmony with all the rest, and the whole in unison with all nature? If yes, will you submit a scheme, or plan, or key-diagram illustrative of the principles upon which you would labor in renewing it in all its parts?

(2.) If convinced of our perfect knowledge of the pyramid as a metrological monument, will you point out therein its units of length, and capacity, and weight, angle, temperature, pressure, etc., showing how they check each other by their scheme of numerical repetitions, and why they are not only the pyramid units, but are also those which shall be international because of world-wide and earth-commensuric import?

(3.) If so convinced, and you point out the mutually pyramidal and earth-commensuric units, will you give their exact numerical values at standard temperature and pressure, also their mutual interferences, and demonstrate that the values you give are right? Show how they each and all may be accurately reproduced by a direct appeal to nature, and demonstrate that every renewal would reproduce the unit sought for and no other.

(4.) If you are not satisfied that we have yet solved the whole metrological scheme of the Great Pyramid, do you, or do you not believe it embodies references to the only true and universal metrological system of our earth, and if so, or not, do you think the Institute should delay its adoption of units and the fixing of their numerical value until the pyramid itself has been thoroughly solved?

(5.) Do you believe the one true earth-commensuric system of metrology has been discovered, or is in use among men, and if so, what is it and what are its units as to numerical value (expressed exactly) and how may we obtain them practically, repeatedly, and always accurately, and why are they earth-commensuric?

(6.) Is it, or is it not, in your opinion, an over-hasty act for the Institute to settle upon any unit before we can demonstrate its absolute harmony with the earth, its practicability, ease of renewal, and convenience for daily use?

(7.) Is, or is not, the "inch" the true linear "unit"? If so, which inch? the pyramid or geometric, the American or British, the modern or ancient Anglo-Saxon? and if either, why? Give its length in terms of the simple seconds pendulum, or any other fixed thing of nature.

(8.) Is the "ounce" or "grain," the true unit of weight? Why, and which ounce or grain?

(9.) Express its value in cubic inches of water, at mean temperature, and pressure, and show how it is earth-commensuric, why it should be international, and how it can be accurately recovered if lost, etc., etc.

Not my friends until every one of the foregoing questions can be answered in language and argument so strong as to receive the assent of men outside of our Institute may we as a body presume to feel that we are ready to establish the units of metrology for all time and for all nations.

C. A. L. TOTTEN.

To Charles Latimer, Civil Engineer,
President, and Members International Institute.

1420 Chestnut St., PHILADELPHIA, June 6, 1883.

CHAS. LATIMER, ESQ.,

DEAR SIR:

In perusing further on Mr. Searles' comments on Mr. Dow's Restored Leaf, it has seemed to me that the discovery of the forty-seventh proposition in Euclid in the King's Chamber, in the only three lines of a triangle which can give the whole linear, surface, and solid measure it contains, proves conclusively, not only that said proposition was known and solved by the architect practically, but that it gives us the true rule for rectifying all errors in the measurements of any of its parts, so that they all harmonize with these proportions; as, for example, the slight difference between Smyth, Greaves, Lanes, and other practical measurements. It is a remarkable and significant fact that this right angle triangle, made of the two diagonals (end and solid) and base side, is made up of the only three lines that can give us the entire measurement of the King's Chamber, linear, surface, and solid, and that either of these lines cannot be lengthened or shortened without destroying the harmony designed. I regard this as a fixed starting point, and rule, by which to test all other measures related to those in the King's Chamber.

Then again, there are other harmonies in the measurements of the King's Chamber which Mr. Searles has pointed out, which could not exist if the proportions in that right angle triangle were destroyed; for example, the height is exactly twice the width, and the width is exactly two-thirds of the end diagonal. Yours truly,

JAMES FRENCH.

The society is in receipt of some most remarkable, and, to the thoughtful world, especially interesting papers from W. T. Allan, Esq., of Greenville, Pennsylvania, the insertion of which is only precluded at present through lack of space in our very young protégé, The International Standard. Suffice it to say, however, that future issues may bear to our members, readers, and friends the results of his scholarly labors and investigations in science and Scripture according, as they do, with the immaculate truths reflected in the absolute identity of science with religion. From the papers which are quite voluminous, we quote the following extract. "Taking some of the predominating elements in nature, let us ascertain from their character where to place them upon the chart. Oxygen, one of the most widely diffused elements of nature in the lowest spectrum that I find recorded, shows bands running through red, green, purple, orange, and blue. We might, from its predominating color, place it under No. 1. It is a life-giving element, a life-supporting element. It is diffused throughout the world; the creation seems to be sustained by it as the most important of all the elements, hence, being more symbolical of God than any other, it is assigned the first place in numbers.

Nitrogen exhibits bands in the green and red, as does also hydrogen, and consequently belongs under No. 5. Carbon predominates in the blue, more readily observed, I believe, in the absorption spectra. Now, if we unite any of these elements under these numbers' the result will be a compound substance, and symbolical of the being under which it comes; as will also the union of the numbers. If we unite oxygen and hydrogen the result is water under the intermediate head, or No. 3. Turning to John VII; 38–39, we find it distinctly stated that water is a type of the Holy Spirit, as is also intimated in many other portions of Scripture."

From a long and remarkably suggestive letter from Theo. Gribi, Esq., secretary of the Elgin (Illinois) Scientific Society, and which space alone precludes us from publishing in full, we present the following extract:

"You may wonder why I am so enthusiastically opposed to the French metric system, when I tell you that I am a native of Switzerland where that system has been adopted, and that not only am I acquainted with many of its advocates on the other side of the water, notably with the prime mover of the international introduction of it, Dr. Adolph Hirsh, director of the observatory at Neufchatel, but that for years I have used no other instruments of measurement than those constructed on the metric system (and I have a great many very fine ones). But I look at the system as to its claims to scientific merit, to cosmical relations and adaptability to common use; and from these standpoints I have always considered it absurd in the highest degree. Many a controversy have I waged with Dr. Hirsh against it. When I became acquainted with the Great Pyramid researches some six years ago, through the works of Prof. P. Smyth, the last vestiges of adherence to it,—if there were any left—were eradicated from my mind."

Additional letters have been received from Lieut. Totten, A. B. Taylor, John C. Wilson, Dr. Epstein, W. T. Allan, Rev. H. G. Wood, and S. E. Massey, of Royalton, Michigan, who also sends a most interesting chart and diagrams which hang in the society's rooms for the inspection and study of the scholar and student; also from B. A. Mitchell, Jr., Philadelphia; Rev. James French, Philadelphia, communicating the interesting paper on Full Times in the present number; also J. M. Clark, compiler of the Metric Analogues, and from Mr. Lucian Bisbee, secretary of the Inter-

national Institute, who forwards the prospectus of the Grand Foreign Exhibition to be held at Boston, Massachusetts, September, 1883, under the auspices of the Massachusetts Charitable Mechanic Association, which was incorporated in that city in 1795. Mr. Bisbee will have the high privilege of exhibiting a model of the Great Pyramid of Jeezeh, which is intended to represent Egypt. The model is constructed by Mr. L. Bisbee in all its known bearings: a task for which our worthy secretary has ample qualification, sustained by consummate scholarship in pyramid lore, and whose enthusiastic work in behalf of the Institute is well appreciated by every member. The size of his exhibit will be about six feet, and in true proportions to the great Egyptian structure.

Extract of letter sent T. W. Spice, Secretary Chamber of Commerce, Leeds, England:

CLEVELAND, March 12, 1883.

. . . . The Ohio Auxiliary Society of the International Institute for preserv- and perfecting weights and measures, has also been considering the desirability of establishing an International gauge based on the British inch.

At the last meeting of this society I had the honor to submit a form of guage that seems to meet the requirement of a standard for daily use by workmen and others. I inclose herewith a drawing of one form of my proposed guage, by which it will be seen that the order of numbers is reversed. By so doing I am enabled to furnish a gauge, the numbers of which convey an exact idea of the parts of an inch included in any one number. The diameters included in each number progress by exactly one one-hundredth of an inch, which is less than in most of the old gauges. By dividing the numbers by ¼, ½, and ¾, we can get dimensions of .0025 while retaining the initial numbers. For example, 5½ would be .055; 5¾ =.0575, and so on.

Of course no attempt has been made to make the graduation to conform in any way to the bulk or weight of wire at the point of gauging. That would be a refinement tending to confusion. What is wanted is a gauge for practical use. I have the honor to be, sir,

Yours truly,

GEORGE C. DAVIES.

RESOLUTIONS.

Copy of resolution passed at a meeting held March 28th, 1883:

Resolved, That this society deprecates the acts of Government officers in transcending the laws of Congress, in issuing orders for the compulsory use of the French system of weights and measures in the Government hospitals and elsewhere, and also the act of the Treasury Department in having the coinage of the nickel made in French weight and measure of gramme and millimeter instead of the Anglo-Saxon terms of grains and inches as required by law.

That the society will move the repeal of Sections 3515 and 3516 of the revised statutes of the United States, by which the half dollar, quarter dollar, and dime are required to be coined in the French weights, and that the motto "In God we Trust," be placed upon all the coins of our country.

NEW DEPARTMENTS.

Our next number will include two new departments. The first, "Papers by an Observer," will be a bi-monthly review of current events, especially of the scientific world. The second, entitled "The Inquirers' Club," will consist of notes, queries and answers, from correspondents in this country and abroad.

All communications for this department must be addressed to the editor "Inquirers' Club, International Standard," Y. M. C. A. building. Correspondents must give a responsible signature, not necessarily for publication, and must endeavor to be concise, as space is limited.

We have received several questions for the "Inquirers' Club," but have only space for two or three in this number.

REVIEWS.

In connexion with other most valuable and remarkable books issued by that indefatigable scientific author and writer, C. Piazzi Smyth, Royal Astronomer for Scotland, the president of the Ohio Auxiliary Society of the International Institute, Mr. Chas. Latimer, is in receipt of a copy of a most important addition to the literature of the scientific world entitled Madeira Spectroscopic, being a revision of twenty-one places in the "Red half of the Solar visible Spectrum" with a Rutherfurd Diffraction Grating, at Madeira, (lat. 32° 38′ N., long. 1h 8m W.), during the summer of 1881, fully indexed and illustrated, with comparisons from thirteen published authorities.

Especially is reference made to Plate 18 representing "Colors, on Spectrum Principles" in their natural order; red beginning, and violet ending, with brilliant middle of the spectrum.

This beautiful work must be seen to be fully appreciated. We quote an extract from the pen of the author, touching the "Diffraction Grating" used by him at points of observation. We more readily do so as it reflects great honor on our countryman, L. Rutherfurd, Esq.

Mr. Smyth says: "Having been fortunate enough, in the autumn of 1880, to procure from America two fine examples of the 'Diffraction Gratings,' ruled with such admirable truth by Lewis M. Rutherfurd, Esq., of New York, with 17,296 lines to the inch, over a surface 1.6 inch square on speculum metal, I proceeded to fit up one of them at home on the same table-stand that I had employed with prisms at Lisbon in 1878. The whole was a rough economical affair to look at; but, thanks to the Rutherfurd Grating and its perfections, gifted with some powers of optical presentation far transcending anything that I, at least, had previously used."

"In solar spectroscoping generally, there are three points to be aimed at: 1st, to ascertain the existence, appearance, and place of any particular and so-called 'Faunhofer,' or black lines therein; 2d, to find out what special chemical element any particular line, or slit-reproduction in that recorded place, represents; and 3d, to decide the locality, in all the long line between the instrument and the sun, where such substance imparts its peculiar property to the light passing through it."

As an Appendix the author has added "On the aqueous lines of the Solar Spectrum" by Josiah P. Cook, Jr.

DR. FISH'S LECTURE ON THE TAURIAN MYTH.

"It embraced some of his own discoveries in the translation of Egyptian hieroglyphics and accurate rendering of such words as Apis, Athor, Taurus, Thor, Phoot, Buddha, or Bhoot, Taou, of China, Brahm, etc., and enlarged upon the remarkable revelations of Halliburton regarding the universal Pleiadic worship. The result of these startling revelations in theosophic history will not only overturn every principle of materialism derived from antiquarian research, but with it carry long treasured ideas of heathendom in general. It reveals to us that all the religions of the earth are founded upon the one revelation to the Adamic race; that sure enough the Israelites did take their theism out of Egypt but they not only carried it thence, but 800 years before the exodus the then almost universal knowledge of the true God, and the revelatory comprehension of the present pinnacle of philosophy—the doctrine of the absolute—was triumphant over Egyptian theocracy through the Joktanites, and remained so for 700 years."

The significance of these discoveries lies in the fact that the greatest religious hieroglyph borne upon the monuments of Egypt is the symbol of Apis; that this emblem of some mighty landmark of history is the great architectural seal over the entrance to the pyramid; that it is now capable of indisputable proof that this is the name of the deluge, the emblem of the Taurian Myth, or bull worship, and pleiadic veneration in every system of mythology, in every heathen worship, in the mystic rites of every island savage and prehistoric race, from the Feejee to the ancient Peruvian. That it is contemporaneous with the Nirvana of India, and a forgotten past among the blacks of Australia, and thus establishes the literal truth of the Bible record. It is a singular fact that this structural hieroglyph is directly over the flood mark in the passage.

This is a lecture which should crowd the largest churches in our cities with intelligent Christians, for it brings antique science and modern materialism into instant conflict, overthrowing the most profound basis of modern skepticism if thoroughly and convincingly demonstrated.

Dr. Fish is a geologist and a botanist, and the author of a work on analytical chemistry, so that in the field of science he knows something whereof he speaks; nor is he afraid of the future revelations in the field of nature as affecting the credibility of God's word, or the fact of his intelligent survey of the destiny of man.

MEETING OF THE OHIO AUXILIARY.

The following is an abstract of the account of the June 20th meeting of the Cleveland branch of the Society for perfecting weights and measures, published in the Cleveland *Plain Dealer* of June 21st:

"A distinguished trio of pyramid students was present: J. Ralston Skinner, of Cincinnati; Rev. H. G. Wood, of Sharon; and Samuel Beswick, C. E. of Strathroy, Canada. After the election of the following members—Rev. R. M. Luther, Philadelphia; Philip Golay, C. E., Golconda, Ill.; S. A. Chaplin, Plymouth, Indiana; Samuel Beswick, C. E., Strathroy, Canada, and Lewis Biden, Portsea, England— a letter from Rev. James French, Philadelphia, was read. Rev. H.G. Wood, of Sharon, Pa., then presented a ver able paper which he illustrated with printed diagrams, showing that the meridional curvature of the earth very closely approximates a curve parallel to a cycloid formed by a generating circle having a radius of as many feet as there are inches in one mile.

"The distribution of the diagrams and figures to the audience enabled all to take in the scope of his paper, one of the purposes of which is to prove that the mile of the English, 5,280 feet, is the measure of an arc of one minute of longitude in latitude of 29° 58″ 50′ at the Great Pyramid.

"After a discussion Mr. Samuel Beswick gave an extemporaneous lecture, with illustrative charts, showing that the passage and the chambers in the pyramid give a map of the heavens. The downward passage to ascending passage—taking inches to represent minutes of arc—gave the exact length of the constellation of Cancer; the upper passage to the Grand Gallery represented the measures of Gemini; the Grand Gallery and the level to entrance of the King's Chamber that of Taurus, and the King's Chamber in the circuit corresponded in its measures with the constellation of Aries. In carrying out the theory of Mr. Beswick, it is necessary to have three more chambers in the pyramid, which he claims are situated near and under the entrance of the downward passage. The speaker brought out some most wonderful astronomical analogies, connecting the pyramid with astronomy, astrology, and chronology, entirely new to the members of the society, and excited the most intense interest. His paper is to be followed hereafter with another upon the chronology of the pyramid. Both papers produced extraordinary interest.

"Mr. Wood, the chairman of the committee on standard time and prime meridian, stated that he had received the reports of Sandford Fleming, Jacob M. Clark, Professor C. Piazzi Smyth, and M. Abbé Moigno, and that when all had reported he would summarize them and report.

"Mr. J. R. Skinner was called out and expressed his surprise and gratification at the presentation of the papers of Messrs. Wood and Beswick, and showed that the British mile is shown in the pyramid by the fact that the square root of the inches in one mile is the exact distance from the intersection of downward passage with upward passage to the axial line of the pyramid."

IN REPLY TO A CRITIC.

For the information of many new members and inquirers, we reproduce the paper upon the British inch, formerly issued by the society:

Take the number of seconds in 360°, that is, 1,296,000, and call that the circumference, and find the diameter of the circle by dividing by π, and we have 412529 +. Now point off four figures, you have 4125.+, and look for Howard Vyse's measure of the downward passage, 4126 British inches; again point off three figures, and you have 412.5 +, this is the measured length of the King's chamber in British inches by all measurers; again point off two figures, and you 41.2 +, and this is the outside measured height of the Coffer. Now take the half of the King's chamber length, and you have width of the King's chamber, 206.26 British inches. Again take the half of this width, and you have the measured length of the granite of the ante-chamber floor, 103.1324 +. Can any one doubt that these measures of the circle refer especially to British inches?

Again note that the number of seconds in the analytical unit, or 206265—one thousand times the width of the King's chamber—is the constant used by astronomers to calculate the sun's distance. Note that the granite of the ante-chamber, or 103.13 +, mutliplied by 100 is equal to the surface of a sphere whose diameter is the analytical unit "*A*," or 57.295 +, and that this is a mean proportional between the height and twice the base of the pyramid—the latter discovered by Mr. Dow; also note that the height of the Coffer being one-tenth of the King's chamber length, the depth is one-twelfth of the King's chamber length, and the one-sixth of the depth is 5.729 + one-tenth of the analytical unit, and doubtless represents the density of the earth in comparison to distilled water. Prof. Smyth gives 5.7 to 1.

Now again notice that the base of the pyramid is given by the formula $\frac{180^2}{2\pi}$

and this divided by 100 times the granite of the ante-chambeer, or $\frac{32400}{\pi} = .886226925+$ which I discovered is the constant for obtaining equality of circles and squares. Thus, if 81 be given as the side of a square, by dividing it by .886226925, we obtain the diameter of a circle of equal area, and this happens to be exactly the one-hundredth part of the base of pyramid, or 91.3987125814+. Since the measuring rod, as we call it, or granite of the floor of the ante-chamber $\frac{324}{\pi} = 103.1314+$ multiplied by 100 is equal to the surface of a sphere whose diameter is the analytical unit, or 57.2957 +, and also as Mr. Dow has discovered that the same is a mean proportional between the height and twice the base of the pyramid, and as the above constant, .886226925, is obtained by dividing the base, 9139.871258, by the said measuring rod mutliplied by 100, or 10313.1+ it suggests the thought that the pyramid inch may be obtained by dividing the British inches by ten times the measuring rod and subtracting the quotient from the British inches—thus 9139.87125814 divided by 10 times the measuring rod gives 8.86216925 + now subtract this from the base, and we have 9131.008988 for base in pyramid inches ; divide this by 25. The only question now is, could the tropical year ever have been 365.240359555+. Prof. Stockwell says that the greatest possible variation is 108.4 seconds.

It is plain that if the formulæ as given in this paper, which seem to me are correct beyond a doubt as corrected by Mr. Dow, the pyramid inch cannot be one-thousandth greater than the British, for it will not agree with the days and fractions of days in cubits of base length—but by dividing by 1031.32 + which seems to be the natural divisor—we get the above. A correction is suggested by the raised part of the granite of the ante-chamber.

INQUIRERS' CLUB.

1.—Probably all persons who have had business correspondence with foreign countries have felt the inconvenience arising from the diverse postal currencies. In cases where stamps must be sent for return postage, delay is often occasioned by the lack of a foreign stamp. Authors especially feel the disadvantages of this. An international postal currency would obviate the difficulty, and probably all will concur in its practical utility.

Does this subject come within the province of The International Institute? J. S.

2.—In The International Standard, for March, I observe the following paragraph :

"The same stars which looked upon the last moments of George Washington, the patriarch of liberty, shone upon the moment of the birth of James A. Garfield; and the constellation whose type he was, with sword uplifted, was the one claimed by Nimrod and Napoleon Bonapart. Orion, the constellation of the measuring rod, and of just weights and measures, which shone in meridian splendor, in the place of honor, at his advent, appeared in the east at his birth into the heavenly mansions."

Does The International Institute, as a corporate body, profess a belief in astrology; or is this an individual expression of opinion? ASTER.

3.—From a pamphlet by Sandford Fleming, Civil Engineer, Ottawa, Canada, on the subject of "Standard Time," we select the following from a list of questions:

Question 1.—Are you in favor of a comprehensive system of standard time for North America?

Question 2.—Do you favor the idea of bringing the standards of time of all countries into agreement?

Question 3.—In order to obtain the object set forth in question No. 2, do you consider it advisable to secure a time system for this country which would commend itself to other nations and be adopted by them ultimately?

Question 10.—In order to secure perfect uniformity and accuracy, do you favor the proposal to have standard time disseminated throughout the country by central authority controlled by Government?

We would like to have opinions from readers of The International Standard upon these questions. TIME REFORM.