

Correspondence.

The Great Pyramid.

To the Editor of the SCIENTIFIC AMERICAN :

In your appendix to the letter of W. F. Quinby, in the SCIENTIFIC AMERICAN of December 18, you say, referring to the Great Pyramid : " As the upper tiers of stones are gone and the exact angle of the slope not determinable, the precise height of the pyramid is a matter of conjecture." This is, I think, a mistake. Prof. C. Piazzi Smyth succeeded in getting at least one of the corner sockets uncovered from the pile of debris under which it had been hidden for ages, and found *in situ* fragments of the casing stones, from which he was enabled to place the exact height of the structure beyond the shadow of a doubt. JOHN NICOL.

Tioga Center, N. Y., December 17, 1897.

[Our esteemed correspondent confuses work done in 1837 by Captain Howard-Vyse with that of Prof. Smyth a good many years later. Captain Vyse uncovered two of the corners of the Great Pyramid and found the seats of the corner stones in the natural rock. He also found two of the casing stones in position, and measured them. It is on these that Prof. Smyth depends for his data in his book, " Our Inheritance in the Great Pyramid ;" see pages 22-26, 8vo edition, 1874. The angle of slope was 51° 50', from very careful measurements of the angle directly, but computed from the sides of the block the angle was 51° 52' 15" 5'; and from this Prof. Smyth concludes that the exact angle must have been 51° 51' and some seconds. He thinks the seconds should be 14.3. Why is not very apparent.

At a later date Mr. W. Dixon found another casing stone (see the book referred to above, p. 490), which Prof. Smyth calls a " unique stone," and from which the angle of slope was measured as 51° 53' 15" and 51° 49' 55". This Prof. Smyth considers confirms his assumption, but he says, " The top and bottom surfaces are not quite parallel;" and also, " The original worked surface forming the back is entirely gone, and only fragments of the five other surfaces remain."

On these stones all inferences concerning the original height of the Great Pyramid are based. We are of the opinion that the determination of that height to a fraction of an inch is not possible from such data.—ED.]

Arctic Enterprises.

Mr. Peary has returned home from Great Britain and expressed himself as much gratified with the result of his trip. He spoke of Mr. Harnsworth's offer of the " Windward" in the warmest terms. Mr. Peary said : " The proffer was made unconditionally, with the exception that he expressly insisted that she should be used as a free will offering." The " Windward" is a vessel of 250 tons, brigantine rigged and furnished with engines for auxiliary power. She was built for a whaler and was formerly owned by the Hudson Bay Company. The " Windward" is a little smaller than the " Hope." Mr. Harnsworth will have her thoroughly overhauled and fitted with new engines and boilers and will send her over in the spring. Mr. Peary was well received when he addressed the Royal Geographical Society in London and the Royal Scottish Geographical Society. The leading scientific men of London examined the fragments of meteorite which he brought from Greenland last winter and pronounced it of undoubted meteoric origin. Prof. Ramsay, the discoverer of argon and helium, will examine drillings of the meteorite to ascertain if those elements are present.

As soon as Jackson, the explorer, has completed the work connected with the Franz Josef Land expedition he will start for the North Pole. He informed a reporter that his original plans were identical with those of Lieut. Peary, except that he intended to take the east coast of the island instead of the western, mapping out undiscovered land on the route, but since he heard Lieut. Peary's lecture he changed his plan, considering that the American had prior claims. Jackson now proposes to proceed by way of Davis Straits and Baffin's Bay, up the west coast of Elsmere Land and Grinnell Land and thence across to the furthest point reached by Aldrich in 1876; he will then push northward in the direction of any land visible from the coast. The date of his departure is uncertain, and Jackson will only take one companion outside of his crew. He expects to be absent about two years.

The preparations for the Swedish Arctic expedition of 1898 are now completed. It will be under the leadership of Dr. A. G. Nothorst, who accompanied Nordenskjöld in the Greenland expedition of 1883. His main object is to examine the eastern side of Spitzbergen and the region between Spitzbergen and Franz Josef Land. As this area will not probably be accessible in the beginning of the summer, Dr. Nothorst intends to make investigations in western Spitzbergen, Northeast Land and Bear Island. He has bought the steamer " Antarctic," which in 1895 carried a whaling expedition to the South Polar seas. It is now being overhauled and equipped for the trip. The expedition will be well equipped for zoological, hydrographical and cartographical work.

Recent Archæological News.

The Nemi estate, near Rome, including the beautiful Lake Nemi and the woods which were famous for the worship of Diana, is to be sold at auction to pay the debts of Prince Orsini. Two famous pleasure triremes of Emperor Tiberius are submerged in the lake. We have published both a reconstruction of one of the vessels and also illustrations of the mooring rings and other parts of the boat. Lake Nemi is an extinct volcanic crater, and is of a perfect cup shape. It is one of the most beautiful spots in the world, and it is to be hoped that it will be bought by the government and kept intact.

The British Museum has just secured, through the generosity of the well known art collector George Salting, one of the most famous relics in existence. It is known by the name of the Santa Spina, and consists of a large amethyst of exquisite beauty and artistic interest, hollowed out to inclose a thorn from the crown of thorns of the founder of the Christian religion, while one side of the gem is covered by minute paintings on lovely translucent enamel. It was presented by Sultan Saladin to St. Louis of France, and was until a hundred years ago one of the most celebrated treasures of the French nation. Coming into the possession of the late Baron Pichon during one of the periodical revolutions which occasionally turn things upside down in France, it was put on the market at his death, and has now, after a good deal of negotiation, passed into the possession of the English government at a heavy price.

The Genizah or treasure house of an ancient synagogue in Cairo is described in The Times by Dr. S. Schechter, of Cambridge, England. It is a windowless and doorless room at the end of the gallery, with an entrance through a big shapeless hole reached by a ladder. Here, in obedience to the injunction upon the Jews not to destroy any of their sacred books, which finally came to include the preservation of all writings in the Hebrew characters, have been deposited, during the past two thousand years, worn out and defective copies of such books, sound copies of " disgraced " books (that is, such as have once pretended to the rank of Scriptures, but have been authoritatively condemned as uninspired), and various Hebrew documents. Some parts of the immense mass, which includes books printed during the last four hundred years, are in a fair state of preservation, others are squeezed into unshapely lumps, while still others are " literally ground to dust in the terrible struggle for space." Dr. Schechter was able to rescue about forty thousand fragments of manuscripts, which have been placed in the library of the University of Cambridge, and are now being carefully examined. They consist mainly of parts of the Old Testament, some going as far back as the tenth century, of Jewish liturgical works, of the two Talmuds, very many hymns, legal documents, letters, prescriptions, amulets and fragments of miscellaneous works.

The Visibility of Colors at Great Distances.

In view of the accuracy of the long range small caliber rifles, interesting experiments were recently conducted by the Society of Civil Engineers in Paris, in order to determine the visibility of different colors. To designate the visibility of colors at great distances numbers from one to eight were taken, eight signifying invisibility. It was regarded as a matter of importance to determine how these numbers compare in clear weather, in cloudy weather and at night. The result of observation at 600 meters (650 yards) is given as follows : In clear weather white is most distinctly visible (1), then comes hussar blue, light blue (2), scarlet (3), green (4); gray and the color of dry foliage are almost invisible and were marked 7. Dark blue was called 6. In cloudy weather nothing was altered in case of white, blue, green and brown. Hussar blue becomes less visible (3), so also scarlet (4); on the other hand, green becomes more visible (3). At night the results were the same as in cloudy weather, except that white becomes invisible and so passes from 1 to 8.

The colors of the German and Italian infantry (iron gray and dark blue) were classified as 6. In France, in consequence of the red képi, the dark blue coat and the scarlet trousers, the average number obtained was 4½. But it is believed that in reality the disadvantage of the French infantry will turn out to be less, because only that part of the red trousers between the lower edge of the coat and the top of the boot is visible, and even this will be so dusty after the first day's march that no actual color will be visible. The light reflected from cuirasses, helmets and sabers is not taken into account.—Schweizerische Militärische Blätter. Translated by The Journal of the United States Artillery.

Eighty-seven Warships Building in Britain.

The general disposition to increase naval armaments can be gaged by the fact that 87 warships are building in Great Britain alone. They aggregate a displacement of 318,612 tons. Of the 87 warships, 34 go to foreign governments.

Science Notes.

The draining of a pond at the State Hatchery, St. Joseph, Mo., a few days ago for the purpose of removing the bass to another pond furnished a surprise to Fish Commissioner Yenawine and Superintendent Carson. So few bass were found that they suspected some thief had captured the former inhabitants of the water, but a short time after the pond was drained one of the men stumbled onto a fish in walking over the partially dry bottom of the pond, and, upon picking it up, he found a bass, and investigation revealed a large number of the fishes ensconced in the mud, some of them twelve inches below the surface. Commissioner Yenawine thinks this experience should set at rest all doubts as to whether the black bass hibernates in the mud in the winter.

Some ten years ago Weber discovered, says Nature, that a heated body begins to emit visible radiations at a lower temperature than that at which it exhibits the well-known glow of red heat. This " gray glow," as it has been termed, has been investigated from a physiological standpoint by Herr O. Lummer (Annalen der Physik und Chemie, 62). According to the author's theory, the observed appearances are due to the different susceptibilities of the rods and cones of the retina to light of varying intensity, the gray glow being perceptible only to the rods, while the red glow stimulates the cones. It is proposed to make observations of the lowest temperature at which luminosity occurs. Herr Lummer expresses the view that this temperature depends in some degree on the area of retinal surface exposed to the radiations.

Scientists rarely agree in their estimate of the probable heat of the sun, though it appears that the same opinion on this point is shared by Prof. Langley and Lord Kelvin, whose calculations fix the temperature of that luminary at about 8,000° Centigrade. They arrived at this result from figures based on solar photometers. The eminent Italian astronomer and mathematician, Secchi, gave it as his opinion that the temperature could be but little, if any, short of 10,000,000° Centigrade; Sporer thought it might be 37,000°, while Pouillet brought it down to somewhere between 1,400° and 1,800° of the same scale. M. Becquerel's opinion was in substantial agreement with that of Prof. Langley. Again, M. St. Clair Deville declares that the heat of the solar surface does not give evidence of being in excess of 2,800°—this conclusion being in accordance, also, with the conclusions arrived at by Bunsen and Debray. But Sir Robert Ball, professor of astronomy at Cambridge, England, is quoted as rating the effective temperature of the sun as probably 18,000°.

Milton Whitney, Chief of the Division of Soils of the Department of Agriculture, in his annual report to the secretary, says : " The electrical method of moisture determination has been still further perfected. Sixteen stations have been equipped with electrical instruments in various parts of the country, and in several important types of soil. Records have been kept at these stations for periods varying from two to four months, and it has been found that the method can be used by anyone with ordinary care. As a result of these field records, I feel perfectly satisfied with the operations of the method, and equally satisfied that it will prove of great value in soil investigations, as well as of practical and commercial value. One great value of the method is that the electrodes are permanently buried in the field at any depth desired, and the field can be cultivated or cropped as usual. The electrical resistance between the electrodes is read from a scale, and this resistance varies according to the square of the water contents. By once thoroughly standardizing the electrodes and by the use of tables furnished by the division, the moisture contents of the soil can be determined at any time from the electrical resistance of the soil."

Preservation of Eggs.—Experiments have been made by Director Strauch, of the Agricultural School in Neisse (Germany), with various methods for keeping eggs fresh. At the beginning of July 20 fresh eggs were treated by each method and examined at the end of February. The results, says The Pharmaceutical Era, are given below.

Kept in brine : All unfit for use. Not decayed, but unpalatable from being saturated with salt.

	Per cent spoiled.
Wrapped in paper.....	80
Kept in a solution of salicylic acid and glycerine.....	80
Rubbed with salt.....	70
Packed in bran.....	70
Coated with paraffin.....	70
Painted with a solution of salicylic acid and glycerine.....	70
Immersed in boiling water 12-15 seconds.....	50
Treated with a solution of alum.....	50
Kept in a solution of salicylic acid.....	50
Coated with soluble glass.....	40
Coated with colloidal.....	40
Coated with varnish.....	40
Rubbed with bacon.....	30
Packed in wood ashes.....	20
Treated with boric acid and soluble glass.....	20
Treated with potassium permanganate.....	20
Coated with vaseline and kept in lime water.....	All good
Kept in soluble glass.....	All very good

—Südd. Ap. Zt.