

CURIOSITIES OF THE CENTENNIAL.

The Mineral Annex to the Main Building was probably less visited by the general multitude than any other part of the great display. It was off the line of travel, obscured by its huge neighbor and (owing to its containing, "nothing but old stones," as we heard a rural visitor contemptuously remark as he turned on his heel on the threshold) people, when limited on time, invariably omitted it from their sight-seeing programme. Mineralists and antiquarians selfishly viewed this state of affairs with vast satisfaction, because, even when the crowds elsewhere rendered aisles impassible, the passages of this annex were free, and one might study the collection leisurely and undisturbed. A great many thoughtful people, who belonged to neither of the above professions, however, found the "old stones" one of the most interesting exhibits in the whole Exposition, and for the reason that those rudely fashioned fragments tell us all that we know concerning that mysterious race that owned our land, long before the Indians became possessed of it.

MOUND BUILDERS' RELICS.

Here were arrow heads of flint, broad axes of stone, mortars and pestles the same as Mexican tribes use today, copper pots and kettles, rude needles of bone, spears, and personal ornaments. There were skulls dry and black with age, belonging to that race which came whence we know not, and which disappeared as mysteriously as it arose, leav-

ing us nothing but the mounds which dot the Mississippi and Ohio valleys, and these crude relics, to tell of their existence. All that the strictest research has determined regarding this strange people may be told in a paragraph. Their works, in magnitude, dispersion, and uniformity, indicate a numerous population essentially homogeneous in customs, habits, religion, and government. They belonged to a family of men, says one learned antiquarian, "moving in the same general direction, acting under common impulses, and influenced by similar causes." No tribe of Indians ever known has attained the social state which would enable them to compel the unproductive labor of the people to be applied to the works that we now find. Geological formations and the condition of the human remains obtained prove that the monuments of the Mississippi valley are at least 2,000 years old. And this is all. Who built the mounds, whether their authors migrated to remote lands, or whether they were swept away by a conquering people or by a terrible epidemic or famine, are questions probably beyond the power of human investigation to answer.

It is curious that, while the cuneiform characters of the ancient people of the East and the hieroglyphics of the Egyptians can now be translated into modern tongues with ease and certainty, American inscriptions still defy the efforts of the antiquarians. Yet we have monuments of the Aztecs with engraving upon them which we are reasonably certain

is written speech, and in this respect we have a foothold for further efforts, which, as regards the mound builders, we do not possess. We have inscribed stones, it is true. Some are merely covered with representations of animals and no writing, as are the Arizona Painted Rocks, illustrated in this issue. In our collection of Centennial curiosities, we give sketches of two examples, having inscriptions similar to writing, but there is no certainty that such is the fact. The Michigan tablet has scratches on it resembling Runic characters; some of the marks correspond to the A, K, S, D, I, and O of the old Norse tongue, as a comparison with the alphabet shows; others are destitute of any like resemblance. The Cincinnati tablet is an elaborately engraved stone, found with some human remains in a mound in Cincinnati, Ohio. The engraving may be merely ornamental, a view to which its symmetry would lead; but, on the other hand, it bears a not remote resemblance to known Central American hieroglyphics. Again, so many such tablets have been found and declared spurious, or as belonging to a later race, that, even admitting these that presented were, as they doubtless are, genuine mound relics, there is no proof that the race which built the mounds originally deposited them there. And thus even these slender aids to lifting the veil, which covers the past history of the land we live in, are of no real use.

BARTHOLDI'S STATUE OF LIBERTY.

The hand of the great statue which it is proposed to erect



THE CINCINNATI TABLET.



HAND AND TORCH OF BARTHOLDI'S STATUE OF LIBERTY



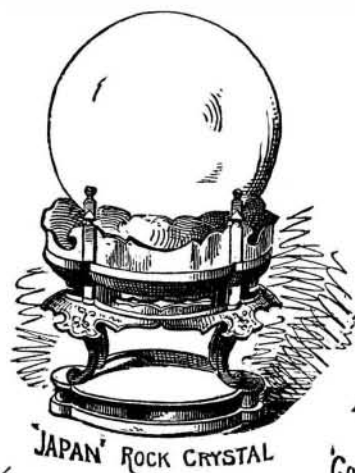
'RUSSIA' SILVER NAPKIN & GOLD VESSEL



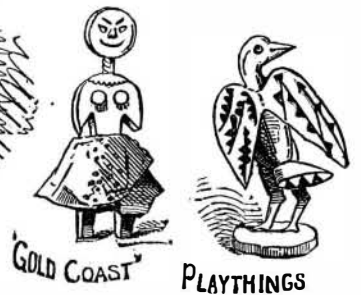
JAPANESE BRONZES SEA GOD.



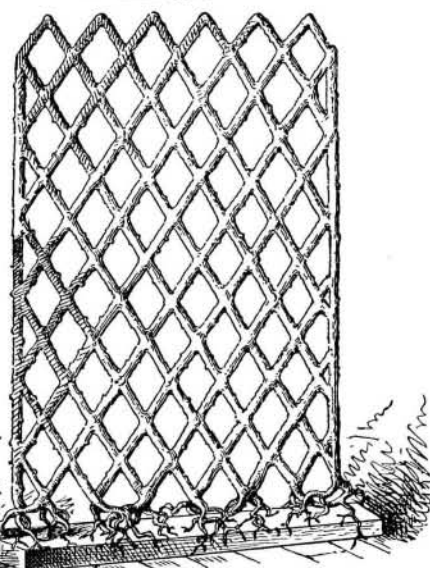
'JAPAN' ROCK CRYSTAL



'JAPAN' ROCK CRYSTAL



'GOLD COAST' PLAYTHINGS



'NORWAY' NATURAL GROWTH



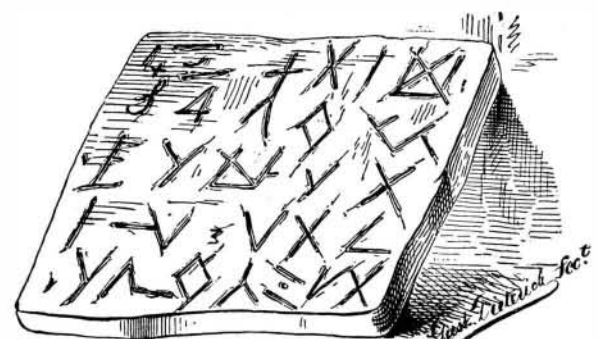
SOUTH AUSTRALIA. EMU EGG ORNAMENT.



'PORTUGAL' WATER MONKEYS.



SOUTH AUSTRALIA. EMU EGG ORNAMENT.



MICHIGAN TABLET.

Curiosities at THE CENTENNIAL EXHIBITION.

on Bedloe's Island, New York harbor, is set up in the Centennial grounds, in order to afford to the people an idea of the colossal size of the figure when it shall be completed. The weight of the member, with the torch which it holds, is about ten tons. It is not cast, but is made of thin copper plates hammered into shape and riveted together. The length of hand and wrist is about eleven feet, the second finger is six feet long, and the thumb nail is thirteen inches square. The circumference of the thickest part of the fore arm is sixteen feet six inches. The gallery around the torch accommodates about twelve persons. The total height of the statue will be one hundred and fifteen feet, or, including that of the pedestal, two hundred and twenty feet, about thirty feet less than the height of Trinity church steeple in this city.

JAPANESE ART OBJECTS.

In a large number of the famous Japanese bronzes, exhibited in the Main Building, the subjects were notably derived from Chinese or Japanese mythology. One of the most magnificent of these works of art is represented, though of course without its exquisite detail, in our sketch, and is an incense-burning vessel held in the hands of a sea god or devil, above whose head the legendary dragon rears itself. For bronzes of this description, the metal is cast in clay molds formed upon models made of a mixture of wax and resin, which is melted out from the finished mold previous to pouring the metal in. The melting furnaces are of exceedingly small dimensions, and generally are iron kettles lined with clay. After casting, the pattern is carefully corrected and worked out by chiseling; but the best bronze casters prepare the model, the mold, and the alloy in such a way as to produce casting which needs no further correcting or finishing. The garments of the divinity represented are elaborately covered with a damask pattern of exquisite inlaid work. The process by which this is done differs according to the nature of the material on which it is produced. Sometimes the design is hollowed out to a certain depth with a graver or chisel, and the ornamenting metal, silver, gold, etc., generally in the shape of threads, is laid into the hollow spaces and hammered over, should the alloy be soft enough. The edges of these grooves are first slightly driven up, so that, when the metal has been laid in, they can easily be hammered down again, thus confining the latter in place. Or else the surface is merely covered in the required places with a narrow network of lines by means of filing, and the thin gold or silver leaf fastened on to this rough surface by hammering. When astrology was a living and not a very dead science, as it now is, those who credited its teachings likewise believed that certain persons were possessed of wonderful powers, which enabled them, when they looked into a crystal globe, of seeing future events transpire. We doubt if the Japanese have any similar superstition; but unless they have, there is no obvious use to which their magnificent crystals (two of which we represent) can be devoted, outside of ornamental purposes. The smaller crystal is cut in pear or fig shape, and is surrounded by strangely twisted ivory leaves. The larger one is a perfect sphere, some seven inches in diameter. Both are mounted on superbly lacquered stands. The small crystal is valued at \$800, and the larger at \$1,000.

THE RUSSIAN GOLD AND SILVER WORK

we have already quite fully described in our notes on the Centennial during its progress. The sketch represents a salver and bowl of ornamented silver gilt, over which exquisite fringed or lace-bordered napkins, of some silver tissue, appear to be thrown. Close examination shows that the napkins are no fabric, but are solid metal, forming in one case a part of the salver, and in the other the cover for the bowl. Every thread of the texture, or of the lace border, even a colored edging pattern, is copied with minute accuracy; and the perfectly natural falling of the folds adds to a deception which can scarcely be discerned save by touch.

Two very curious

EMU EGG ORNAMENTS

are also depicted. The egg looks as if made of dark green morocco leather, and is about five inches in its long diameter. After removing the contents, the Australian jewelers mount them in silver in very tasteful designs. In one the egg is supported on the twisted trunks of palm trees, and ferns rise up on either side. On top, an Australian aboriginal native is standing. The other design introduces the emu and the kangaroo, while the egg is supported by a kneeling figure.

PORTUGUESE WATER MONKEYS

are universally used in all hot countries where ice is a luxury not to be obtained save at ruinous prices. They are vessels of unbaked clay, perfectly porous, and made in the form shown. The larger is intended to hang in a window or wherever a draft of air can be had, so that the evaporation which takes place on the exterior of the vessel may be hastened, and the water within thus more rapidly cooled. The other jar is of the kind which usually replaces the pitcher on the table. The ornamentation of the exteriors is quite tasteful, although the design is merely scratched in.

A curious growth of wood is also represented in the engraving. The material appears to be a species of vine which has been trained and its parts united so as to form a perfectly formed screen or trellis. Lastly, we give sketches of Young Africa's playthings, which show that the youthful denizen of the Gold Coast demands toys not a whit less realistic than his civilized brethren of the rest of the world. Besides, there is a good deal of crude talent exhibited in the carving. The leopard, for instance, with an unknown animal of iacognate species in his mouth, shows far greater

skill in carving and knowledge of anatomy withal than the frightful spotted horses or jointless-legged cats wherewith Young America amuses himself. The animal, it will be observed, stands at bay, lashing its sides with its tail and holding its prey in its mouth. His spots are burned on with a hot iron. The bird shows a similar imitative ability; the doll, we cannot say so much for; but here the baneful influence of the vices of civilization affect the untutored intellect, for a bit of English or American calico is added to form a very obvious crinoline.

Correspondence.

The Duration of Vulcan's Transit.

To the Editor of the Scientific American:

The distance from the sun of an intra-Mercurial planet, to be in proportion with the grade of solar distances of other planets, ought to be in the neighborhood of 20,000,000 miles, at which distance Kepler's third law would determine the periodic time of the planet to be about 35 days. Assuming these figures to be substantially correct, and the supposititious planet to have an orbit similar in shape to those of other planets, it would move through about 2° of its orbit while passing centrally across the solar disk, the duration of which transit could not much exceed five hours time.

These figures are roughly calculated, but they indicate the impossibility of Vulcan's remaining upon the sun's face as long as the periods suggested by some of your correspondents. To make the duration of transit fifteen hours would be to locate Vulcan's orbit outside that of Venus.

Rochester, N. Y.

E. B. WHITMORE.

The Scientific American Supplement.

We are in the frequent receipt of enquiries like the following:

"Publishers of Scientific American:

You advertise to furnish the SCIENTIFIC AMERICAN and SUPPLEMENT for one year, postage prepaid, for seven dollars. Having already sent my subscription for the SCIENTIFIC AMERICAN, \$3.20, I would like to know if, by now forwarding the balance of \$3.80, you will send the SUPPLEMENT along?"

J. H."

Answer: Yes. Any person now a subscriber to the SCIENTIFIC AMERICAN, by remitting to us the difference between seven dollars and the amount he has already paid to us, may receive the SUPPLEMENT for one year: dating from No. 1 of the SUPPLEMENT or from the present time, as he prefers. We can furnish all the back numbers. In addition to the large quantity of illustrated information pertaining to all the various branches of Science, the SUPPLEMENT for 1876 will be especially valuable for preservation as a general pictorial and scientific record of the great Centennial International Exhibition.

Intelligence the Key to Success.

"It may be laid down as a general rule that, in any business, whether it be in trade, in mechanics, or manufacturing, the intelligent educated man will be the most apt to succeed. Of course there are exceptions, but they only prove the truth of the general rule. And by this we do not mean the collegian or the man liberally educated in the schools, for as a general thing they are not the men we find in shops and factories. But we do mean those mechanics and proprietors or superintendents of manufacturing establishments who make it a point to improve upon their common school education by judicious reading and study, by which means they keep themselves posted upon all the improvements and advances made, not only in the industries generally, but especially in that particular industry in which they are personally interested.

"For several years past our business has brought us into frequent contact with manufacturers in almost every branch of industry, and we have observed closely the general intellectual status of this large and growing class of our population. There are two classes of manufacturers occupying opposite extremes—those devoting all the time they can spare, or even more, to the acquisition of mechanical information—in some instances, perhaps, to the neglect of the practical business details of their calling; the other class, which is much the larger, refusing or neglecting to avail themselves of the information furnished by those publications and journals devoted exclusively to mechanical, manufacturing, and scientific subjects. They claim that they have no time to spend in reading papers—no time to waste in the pursuit of knowledge. Indeed they rather boast that, although they have subscribed for some paper devoted to mechanical, scientific, and useful information, they have not even opened it for months, and not unfrequently they will point to a dust-covered pile of unopened papers, with a smile of self-satisfied pride, as an evidence of their independence of all editorial or extraneous assistance. Such men forget that this is an age of progress—that nearly all our manufacturing industries are in that transition state, as it were, between a hopeful opening and a full fruition of final success. Improvements in methods, improvements in machinery, and improvements in products are constantly being made; and the manufacturer who neglects to keep himself posted on all such matters not unfrequently deprives himself of the information and experience of others, that would contribute largely to his own success. Intelligence is one of the first essentials to the successful prosecution of profitable industries; and the proprietor or manager of extensive manufacturing establishments, who goes on the as-

sumption that he already knows all that is worth knowing in relation to the industry in which he is engaged, will be apt to find himself, in the long run, left far behind in the race by many who have started out later in the day and under far less favorable circumstances, apparently, who have availed themselves of all the aids offered to keep fully up with the march of improvement.

"The growth and progress of manufacturing industries in this country have been stimulated and urged on to their present development largely by the advocacy and encouragement of editors and writers who have given their whole time and talent to the study and investigation of the subject in all its bearings—who have accumulated a vast amount of valuable, practical as well as theoretical, information, that can only fail of its object to benefit and advance the cause to which they are devoted by want of application by those for whose advantage it was collated, digested, and prepared. The ancients had a saying which, literally translated, reads: 'Life is short but art is long.' The range of knowledge, information, or intelligence is so extensive that one man can hardly expect, or be expected, to cover the whole ground. Hence we have a variety of journals or publications devoted to a variety of subjects, covering a variety of fields of thought, study, and investigation. First of all comes the newspaper devoted to the current events of the day. This, of course, every intelligent citizen, whatever his calling or occupation, should read. After that come political, literary, scientific, religious, industrial news, etc. And this latter class is still further divided into agricultural, mechanical, manufacturing news, etc. These journals are, or should be, conducted by men of intelligence, of careful and thoughtful study—men who honestly and earnestly labor for the advancement of the special interest to which they are devoted. It would be a libel on human nature to suppose that such an editor would not collect, collate, and present many useful and practical facts and much valuable information that could not be otherwise obtained. The men, or class of men, for whose especial benefit or edification such information is prepared, who, through ignorance, prejudice, self-sufficiency, or any other cause, ignore and disregard it, neglect their own interests and punish themselves much worse than they do the editors whose labors they treat so cavalierly. In this age of the world, ignorance will not win in the race with intelligence, though circumstances may, for the time being, seem to be in its favor.

"There are undoubtedly many persons involved in the care and anxiety of the management of a manufacturing establishment who honestly think they have not the time to read and study a journal published in the interest of their special calling, no matter how able or valuable it may be. But that should not be the case, and if it is, that fact alone shows the necessity for the very information they refuse to accept. It shows that there is not a wise division and disposition of time. One of the most important factors in the problem of successful management of any business is system, method: a time for everything and everything in its time, as well as 'a place for everything and everything in its place.' It is only the man of intelligence who is capable of so systematizing his time and his business as to make both yield the most satisfactory results. The man who is always in a hurry, always just a little behindhand, so that he feels anxious and fearful lest some important matter will not be accomplished in its own time, may calculate that his system is at fault, and that it is not more time that he needs, but a better and wiser disposition of the time he already has.

"The earnest and honest manufacturer who sets out to build up a great, flourishing, and profitable industrial establishment will avail himself of all the information that can be gleaned from the journal, or journals even, devoted to the particular industry in which he is engaged. And in the term 'journals' we do not include that numerous brood of advertising sheets that, under high-sounding titles, are circulated gratuitously and at random, to whomsoever will take them from the post office. Though sometimes containing a few well selected or pilfered articles to give them the appearance of what they are not, reliable journals, they are not edited with that care and ability which alone gives the special journal any value, or any claim to the support of the class to whose interests it is devoted. We earnestly commend these facts and ideas to the great multitude of workers in the industrial fields of the West, in whose interests we have enlisted, and to whose complete success we look forward with hope and gratification."—*Western Manufacturer.*

The United States Skate Trade.

It was not many years ago when all the skates used in the United States came from abroad, chiefly from Germany, and the German skate importation was a lucrative branch of trade. Of late this has almost entirely ceased. The Americans make their own skates now, and, oddly enough, the announcement is made that one of their leading skate factories, the Northampton Skate Company, in Massachusetts is filling orders for nickel-plated skates to be sent to Germany.—*Ironmonger.*

A Fortune in Toothpicks.

It seems that it was not the invention of the wooden toothpick, *per se*, that netted the inventor \$50,000, but the idea of making the toothpicks out of soft, brittle wood. It is said that, when first brought out, the toothpicks were made of hard, fibrous wood; but the inventor soon found that this would not pay, as the picks lasted too long, and he went to pine. It now takes four sound picks to get the broken end of one out from between the teeth; and it is the latter discovery that is said to have realized the inventor his fortune.