

edge, served to keep it in place when tied under the chin, as shown by the bow-knot connecting the ends. There was also around the cap a thread with small feathers of different colors, and a single flint arrow-head attached to it as shown in Fig. 3.

Secured to the back by a hair cord, and also by stitches to the outer covering, was a quiver containing five arrows. The heads are of stone, and the shafts, which are in two parts, are about two feet long; one of these arrows is represented in Fig. 5.

Suspended by a flat belt, passed over the shoulder on one side, was a bag containing leaves of coca (*Erythroxylon coca*) and a thin silver medal. The belt, or band, by which the bag was secured, is woven and of fine yarn in handsome black, white, and brown figures, with a border of red on one side and brown on the other; it is two and a half feet long and over an inch wide. The bag, measuring seven by eight inches, is very handsomely and evenly woven of fine yarn, in black, white, and brown stripes, and the edges are very curiously and tastefully sewed together with red, yellow, blue, and white thread.

The silver medal, or ornament, Fig. 6, found in the bag, is three and a half inches in diameter. A space in the center, three-fourths of an inch in diameter, is countersunk on one side, and in the center of this there is a small, round hole; there are also indentations on one side, all around, near the edge. A triangular piece about three-eighths of an inch long is wanting to render the circle complete, but this may have been broken off accidentally. The medal is very thin and brittle from oxidation. A hair cord, about two feet long, is attached to it, by which it may have been suspended from the neck.

Upon removing the cap and hood there was found, beneath the chin, a small earthen vessel, Fig. 7, about two inches in diameter, the top of which had been closed by a membrane, part of which, with the string which fastened it around the neck, still remains attached. It is not improb-

of the head. The head resembles in form that of the body last mentioned. The hair upon it is fine, of a light brown color, and, when first exposed, was smooth and neatly arranged in braids passed across the upper part of the forehead, then carried backward and secured on each side of the head above the ears. It is somewhat coarser and much shorter than the hair on the head of the man. This body, like the

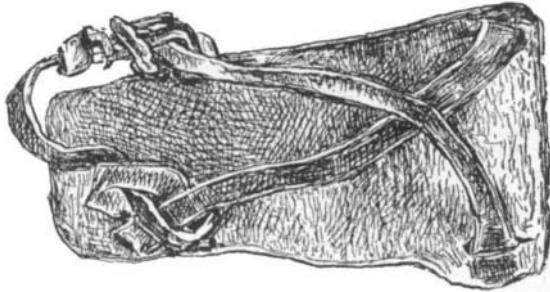


FIG. 9.—SANDAL FROM MUMMY OF AN INFANT. (Natural Size.)

one represented in Fig. 1, when first found, was closely wrapped in woollen garments. On the outside a cord was passed several times around it, and one also between the outer covering and that nearest within it.

Upon removing the outer covering there were found beneath it the following articles: A wooden comb, much worn, with hair adhering to the teeth; a pair of sandals, about 5½

with leaves of coca, two muscle shells, and several small shells of the kind before mentioned. The infant was dressed in a garment of brown cloth. The head was partly covered by a loose cap, lined with a wadding of cotton and hair covered with red paint. Within it was a large lock of soft human hair, on which the head rested; also, folded in a small piece of cloth, and tied with care, was a brown thread with seven knots in it, and on one end what appears like, and probably is, a part of the umbilical cord. Around the neck was a green cord with a small shell attached to it. Of this body, little more than the skeleton and the scalp, which is thickly covered with very fine dark brown hair, remain. The appearance of this and many similar bodies of infants found in this and other Peruvian cemeteries shows that no efforts were made for their preservation, at least no other than, perhaps, by desiccation.

A fetal body, in its wrapper, was also found in this tomb, and it is particularly deserving of notice that, in many others, fetuses were found preserved as carefully as the body of the infant just described.

(To be continued.)

ANCIENT POTTERY FOUND IN MISSOURI MOUNDS.

By A. J. CONANT, A.M., ST. LOUIS.

THE number of vessels of pottery which have been taken from the mounds in Missouri is prodigious, and almost endless in variety. In an instance which fell under my own observation, nearly, if not quite, one thousand pieces were obtained from a single burial mound; and these were of various sizes and great diversity of form and workmanship. Some of the most characteristic examples will be presented as we proceed. The skill displayed by the prehistoric Americans in everything they manufactured from common clay is vastly superior to that of the ancient civilizations of

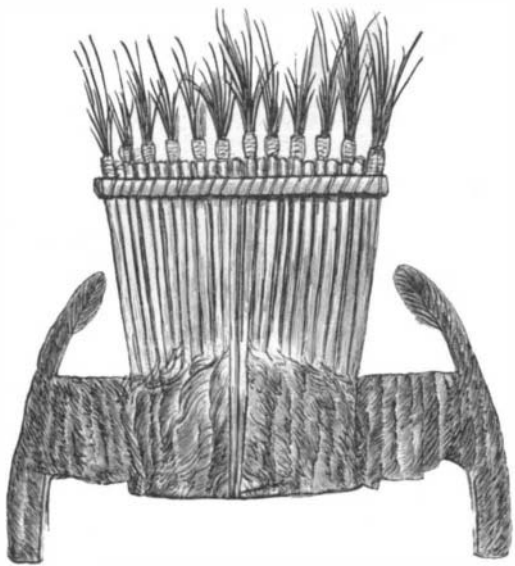


FIG. 4.—FEATHER ORNAMENT FROM CAP.



FIG. 5.—ARROW FOUND WITH MUMMY.

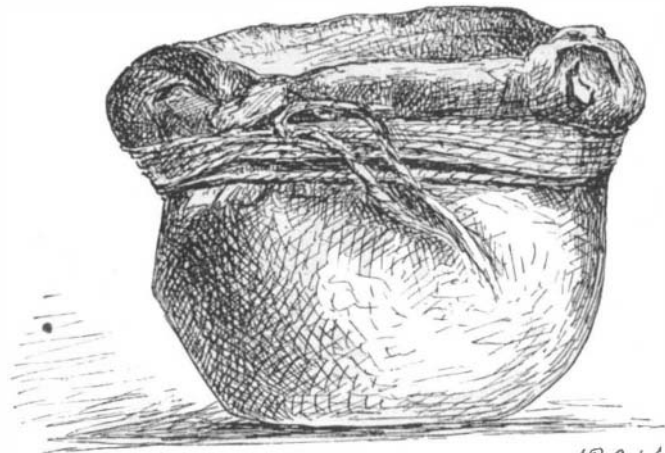


FIG. 7.—CLAY VESSEL FOUND WITH MUMMY.

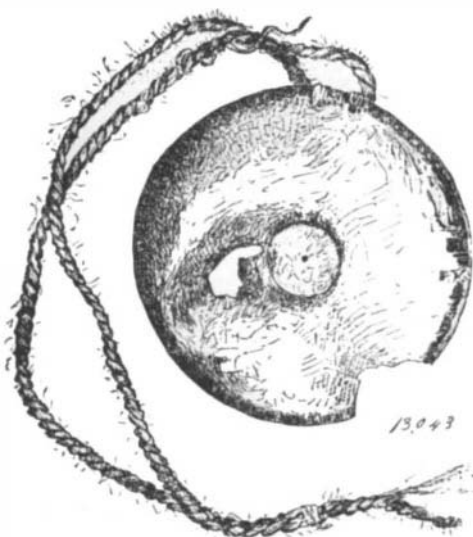


FIG. 6.—SILVER ORNAMENT FOUND WITH MUMMY.



FIG. 8.—MUMMY OF A WOMAN FROM PERU.

ble that this cup contained originally a liquid, and this may account for the condition in which part of the lower jaw, before mentioned, was found, and it may, perhaps, also account for the oxidation of the silver medal. Such a liquid would most likely be *Chicha*, an acid drink, prepared by fermenting roasted maize, which has been known from time immemorial in Peru.

Fig. 8 represents the body of a female, from which all the wrappings have been removed. The fleshy parts, of a dark brown color, are soft, and the joints slightly flexible. For its preservation the same means evidently were used as for the preservation of the body which has just been described. The following are measurements of parts of the skeleton:

Length of humerus, 9 inches; of ulna, 8 inches; of hand, 5.5 inches; of middle finger, 3.5 inches; of femur, 13 inches; of tibia, 12 inches; of foot, 7.7 inches.

The breadth of the hand in the widest part is only 2 inches, and that of the foot only two and a half inches.

From the ankles to the knees the legs are coated with red paint, and there are marks of the same pigment on the hair

inches long and 2 inches broad, painted red; three needles of thorn, about 3 inches long, tied together; two balls of yarn, one of them colored green and very tender, the other white and strong; a small package of shells, *Littorina Peruviana*; a bladder containing red pigment; a small package of *Rutile*; a bladder containing a gum resin, similar to that obtained by treating a part of the flesh of the body first described with water and afterward with alcohol; a pod from an *Algaroba* tree; two muscle shells, *Mytilus*; several locks of human hair, some of them rolled with leaves of coca.

On removal of the inner garment the body appeared, as shown in Fig. 8, with impressions of the cloth upon the flesh, particularly about the face.

In the same tomb there were the remains of an infant, carefully wrapped in a black woollen cloth, and inclosed in the skin of a penguin, with the feather side inward. Attached to the inner wrapper was a pair of sandals, Fig. 9, about 2½ inches in length. Between the wrappers were several small rolls of cotton, also rolls of hair of the vicuna

Europe, to which, in other respects, many striking similarities may be traced.

From the fact that few articles which are the products of human ingenuity and skill are more enduring than earthenware, this class of antiquities, to the archæologist, is very interesting and instructive. The skill and taste displayed in its various imitative forms, in outline and decoration, give us an insight into some phases of domestic life, social condition and æsthetic taste of ancient peoples, which can be derived from no other source. Fragments of pottery to the archæologist, therefore, are the imperishable leaves of a book, inscribed by the truthful hand of humanity, in legible characters, with the precious records of those feelings and tender sentiments which are recorded nowhere else and which need no translation. Their value is enhanced so much the more by the fact that we possess specimens of these records from every quarter of the globe and coeval with the remotest civilizations.

The successful attempts of the ancient Americans to imitate the forms of beasts and birds, which they saw every

day around them, evince a contemplation, observation, and affectionate communion with nature which fill us with surprise.

In reference to the superiority of the skill displayed by the Mound-builders in the ceramic arts, to the corresponding civilization of ancient Europe, I cannot do better than quote the words of Dr Foster:*

"In the plastic arts, the Mound-builders attained a perfection far in advance of any samples which had been found characteristic of the Stone and even the Bronze Age of Europe. We can readily conceive that, in the absence of metallic vessels, pottery would be employed as a substitute, and the potter's art would be held in the highest esteem. From making useful forms, it would be natural to advance to the ornamental. Sir John Lubbock remarks that 'few of the British sepulchral urns, belonging to the ante-Roman times, have upon them any curved lines. Representations of animals and plants are almost entirely wanting.' They are even absent from all the articles belonging to the Bronze Age in Switzerland, and I might almost say in Western Europe generally, while ornaments of curved and spiral lines are eminently characteristic of this period. The ornamental ideas of the Stone Age, on the other hand, are confined, so far as we know, to compositions of straight lines, and the idea of a curve scarcely seems to have occurred to them. The most elegant ornament on their vases are impressions made by the finger nails, or by a cord wound around the soft clay.

"The commonest forms of the Mound builders' pottery represents kettles, cups, water-jugs, pipes, vases, etc., etc. Not content with plain surfaces, they frequently ornamented their surfaces with curved lines and fret-work. They even went farther, and moulded images of birds, quadrupeds, and of the human form. The clay, except for their ordinary kettles, where coarse gravel is often intermixed, is finely tempered, so that it did not warp or crack in baking—the utensils, when completed, having a yellowish or grayish tint."

In the vessels, while the human faces and heads of birds are crudely expressed, we find much to admire in the tasteful forms of the objects themselves. The flow of their outline, so to speak, evinces a degree of refinement of feeling which could only result from a culture of the sense for beauty, which must have required a long time for its realization.

The mouths or openings were, on all, made at the back side of the head. This seems to have been the uniform practice, whether the head of the vessel was that of man, beast, or bird. Sometimes the vessels with vertical openings are fitted with covers of the same material, with projecting knobs on the top for handling them. Sometimes, again, the smaller jugs, or bottles as they should be called, have nicely-adjusted stoppers. These latter bottles are made of much finer material, and while they are generally quite thin, they are so well baked that they seem to be almost as tough and strong as our own ware. Two of the stoppers are "two articles carved from a hard clay slate and carefully smoothed. Their use is problematical, but they so closely resemble lip ornaments as to suggest that they were such." These are now in the "Swallow Collection" of the Peabody museum. In its transportation from Missouri to Massachusetts, the report informs us, many of the articles were so broken as to make their reconstruction impossible. When I had the pleasure of examining this collection, some years since, these stoppers were then attached to the bottles with which they were found. The smaller bottle of the two, Professor Swallow informed me, when taken from the mound, contained a red liquid.

Some of the representations of the human figure are executed with a good degree of fidelity to nature, through all the members; showing that the artist had studied carefully his model, and had evidently labored to tell the truth as he saw it.

Some of the human figures have an expression so striking and individual that we can hardly believe that they are not portraits. This becomes more probable when we examine the animal representations, or rather the heads of birds, with which the pottery is very often ornamented, particularly those of the different varieties of ducks, in which we observe in the shape of the head, line of neck, etc., the nicest distinctions in particular varieties, which are expressed with remarkable skill. This will be apparent when we come to the consideration of food vessels.

Their imitative faculties, as illustrated in their pottery, were certainly remarkable, and to give an adequate idea of the variety of their work in the subjects which might be chosen for illustration would require more space than is allotted to this essay. We proceed, therefore, to consider their cooking utensils.

While these vessels were doubtless for common, every-day use, some of them are really quite artistic and graceful. The forms and ornamentation of the others seem to be more experimental, and perhaps transitional, as though the maker varied a little from his usual manner just to see how they would look.

All have two or more handles, by which they were probably suspended over the fire by passing through them green twigs, which they covered with moist clay to prevent them from burning. Examples might be multiplied, *ad infinitum*, almost, of this class of vessels, but the above is sufficient to illustrate the inventive powers of their authors in this direction, as well as their constant striving to gratify their aesthetic feeling in the manufacture of those fragile articles which were designed for the commonest uses.

One example represents a pot very similar to one of the latter, but entirely unique in this, that it contained the upper portion of a human skull and one vertebra. It was taken from a mound near New Madrid, by Prof. Swallow, who tells us that the vessel must have been moulded around the skull, as it could not be removed without breaking the pot. It is now in the Peabody Museum. This is certainly a curiosity. Nothing like it has been found in any other burial mound here or anywhere else, as far as known. It may be remembered, however, in this connection, as before remarked, that small pots have frequently been found in the larger pans, and which contained a decayed shell or fragment of bone. These were, very likely, valued relics or charms which were buried with their possessor.

One of the most common of varieties of bowls are peculiar in this: the bodies of the vessels are entirely devoid of ornamentation. From the edge of the lip on one side projects a small handle; on the opposite side is moulded the head of some beast or bird, and quite often a human head is represented.

The thing specially to be noticed is the diversity of form in the heads of the ducks. So faithfully are the distinctive features of the different varieties delineated, that those at

all familiar with them must believe that the artist, according to the best of his skill, conscientiously copied nature. The beautiful curve of the neck, and its union with the outline of the vessel itself, could not possibly have been accidental.

The best which these ancient workmen could do is so far inferior to the art of our own times, that it is not easy for us to appreciate the difficulties they must have overcome, their many failures, the long time necessary for the acquisition of those habits of observation, and the development of the skill of hand sufficient to enable them to express themselves as creditably as they have done in all their imitative work. In the class of vessels under consideration, examples decorated with the human head and features are by no means rare. If the credit given them for conscientious observation of nature, and skill in expression of what they saw, is not an over-estimate, then we may believe that, in their delineation of the human face, they also copied nature with a sufficient degree of accuracy to warrant us in the idea that in their work we have at least characteristic likenesses of themselves.

The necessity for condensation demands that here our consideration of this part of our subject should end. The variety and beauty of many of the objects of their fictile skill are very suggestive, and furnish much material for extended generalization. But a remark or two must suffice in this connection. To suppose that all this taste and feeling—this close observation of nature and fidelity in delineation, displayed in the pottery of the Mound-builders, found no expression in any other direction, and was expended upon their domestic utensils alone, is simply incredible. Very different must have been the homes of a people furnished with such tasteful articles, from those miserable huts which the nomadic Indians constructed for their habitations; and it is quite likely that in their dress as well as their dwellings they evinced the same ideas of taste and convenience which we perceive in their domestic utensils. In some of their human effigies we do find the manner of arranging the hair distinctly delineated, and we may yet discover those which shall furnish us with correct representations of their mode of dress. Indeed, I have seen one vessel with figures of men rudely painted in outline upon its sides, who were clad in a flowing garment, gathered by a belt around the waist, and reaching to the knees. In this connection I may mention the engraved shells which have frequently been found with skeletons, both in Missouri and Illinois. One of the most interesting was furnished by the late Captain Whitley. When taken from the mound the shell was quite soft and brittle, and easily cut with the finger-nail. The outer edge was much broken or worn away. The design was inclosed by six circular lines, portions of which still remain. On one side were two perforations, designed, doubtless, for the string by which it was suspended from the neck. All similar shells that I have seen are so perforated. It seems quite evident from the picture that it memorializes the victory of the individual represented as standing over an enemy, who lies on his face at his feet. The victor, it will be observed, holds in his right hand a weapon or symbol of authority, with which he seems to be pressing the prostrate figure to the earth. Many of the accessories are unintelligible. While the whole work is very crude, and the figures out of all proportion, there is here and there an outline which shows earnest endeavor; as the leg of the standing figure, for example, in which also the action is so well expressed as to suggest that, by an impetuous onset, he has just felled his antagonist to the ground. The artist seems to have had most difficulty with the eye, or rather, has made no attempt at imitating that organ.

There is now in the museum of the St. Louis Academy of Science a similar shell, upon which is portrayed, in a creditable manner, the figure of a spider. I have also been shown another by Dr. Richardson, from a mound in Illinois, almost precisely like it, and differing only in a small symbolic device, which is carved upon the back of each. Engraved shells are generally found upon the breast of the skeleton, or in such a position as shows that they were originally placed there, and also where they were probably worn during life. According to Mr. Pidgeon, the spider emblem is perpetuated in the mounds far to the north. He describes one which he saw in Minnesota, about sixty miles above the junction of the St. Peter's river with the Mississippi, which covered nearly an acre of ground. Upon ascending its highest elevation, he tells us, it was very evident that the spider was intended to be represented by it. I bring these facts together for the benefit of future observers, without speculating as to their significance, further than to venture the remark that they point to a great diffusion of one people, or their migration from the north, southwardly along the Mississippi valley.—*Commonwealth of Missouri.*

THE BERLIN PAPER EXPOSITION OF 1878.

We have seen the ordinary uses of paper, and now this last notice will deal of the novel appliances of paper, and the uses to which paper and paper stuff can be put. At various stands we meet the following articles: Masks, animals (models), a full-rigged ship, Chinese lanterns, hats, bonnets, skirts, suits of clothes, pocket handkerchiefs, *serviettes*, baths, buckets, wash-hand basins, water cans, straps, floor cloth, carpet, urns, bronzes, flowers, window blinds, curtains, asphalt roofing, garden walk material, coral (imitation), jewelry, and, finally, a house. These exhibits are made of paper. The only thing I missed was the new material for preventing the fouling of ships' bottoms. I have read that the bottoms of several ships have been coated with about one inch of specially prepared paper. The paper is cemented on, and preserves the ship very efficiently. This will develop a new trade, if it be so successful as reported.

The masks and animals alluded to above are made of papier mâché, and the latter are intended for the use of schools as models. They are very carefully and artistically prepared. There are, of course, innumerable Chinese lanterns, an old use for paper. The hats of paper stuff are very good. They are really a very clever imitation, and a stranger to the trade, and who does not critically examine his wearing apparel, might very easily wear one of the paper hats, and not have the remotest idea that his head was in a mass of pulp. The bonnets and frill work, made of lace paper, were also very fair specimens of skill. But I have seen better goods. The skirts and shirts, etc., of paper were excellent, but supposing the cook went too near the fire! The handkerchiefs were pretty fair, and I carried away the paper *serviette* which was laid for me every day at dinner in the Exhibition restaurant. It is nothing very particular; I think I have seen better elsewhere.

Messrs. Crane Bros., of Westfield, Mass., have a lot of articles in the water-holding vessel line. Baths and buckets, looking exceedingly like metallic goods, are very fine specimens of skill. I should say they are about as perfect as it is

possible to make them. Some belting shown by this enterprising firm deserves attention. I do not know how this paper belting wears, perhaps some one from your side will inform me. Leather belting is very expensive, indeed, and if paper is cheaper and as strong, there ought to be some business.

There is an excellent show of floor cloth, mainly by Seymour Scott Bros., of Philadelphia, who have perfected the production of this special variety of paper. I saw several models of houses whose roofs were made of the asphalt roofing paper. From the appearance of this paper, I should think it most excellent roofing material. It is thick and water tight. Whether with repeated wetting and drying and heat of the sun it will not warp, I can't say, but to all intents and purposes I don't see why it should not be largely employed. This same substance was used, too, as a pavement. The question of wear and tear will come in here; but in a garden where the traffic is not heavy, I think something could be done with it.

I noticed another American firm, the Celluloid Novelty Company, of New York, exhibiting very pretty little red ornaments and personal jewelry in celluloid. These articles looked very much like coral, an imitation of which I expect they really profess to be. From the attention this stand received, especially from the fair portion of the visitors, I should say this firm did a fair business at Berlin.

The *pièce de résistance*, however, was the paper house. The house itself was built of American pine. Then next to the wood came some building paper, followed by wall paper. The roof was our old friend the asphalt roof paper, and the ceiling, highly ornamented, was also of paper. Likewise was the cornice, a very handsome piece of work. The table, chairs, and general furniture were paper, dyed, and properly stained. The Venetian blinds and window curtains, both lace and colored, were also paper, as was the gas chandelier. Upon the table stood paper vases filled with paper flowers, which matched well with the paper table cover. The floor was papered with floor cloth, and a real paper stove was warming the room and astonishing the visitors by its non-consumption of itself. It was made of asbestos paper. Several very handsome bronzes adorned the room, but, on closely inspecting and lifting them, they also turned out to be paper. The door, a superbly-wrought piece of work, was paper, and several cupboards also. The house, as it stood, was bought by a gentleman to adorn his garden. A great deal of attention, and even excitement, was created by this house, which was put up, I believe, by Seymour Scott Bros., Philadelphia.

I must not omit to remark the pyramid of paper representing the consumption of paper by all the principal countries of the world. It is needless to add that America forms the base. At 494 the *Journal* was laid by your special commissioner on the table, where it was, of course, greatly admired, etc., by the throngs of visitors.

Now what can be gathered from the Berlin Exhibition? I venture to say that, so far as the ordinary use of paper is concerned, only one point is worthy of notice, and that is the wood fiber industry. Secondly, we can learn many uses for paper which have not, so far, obtained general notice and the popular eye. But it struck me that all the novelty of this feature of the exhibition is chiefly due to American enterprise. The paper house, the paper baths, urns, floor cloth, carpet paper, belting, jewelry, etc.—all American goods—proved how true it is that you are ever to the front.—*Paper Trade Journal.*

THE RICE PAPER OF CHINA.

THE present rage for art objects of Chinese and Japanese origin has probably made the public generally more familiar than ever before with those exquisitely colored representations of birds, insects, and flowers painted on what has always been familiarly known as "rice paper." These paintings, as well as the delicate, translucent material on which they are executed, were brought from China at an early period of our commerce with that country; and the material was evidently called rice paper for want of a better name, since it is not a paper, properly so-called, nor does any rice enter into its composition. It is, in fact, made by slicing the pith of a plant and pressing it into thin sheets; and if called "paper" at all, should be styled pith paper rather than rice paper. The tree which produces the pith is allied to our American wild sarsaparilla (*Aralia*), and was formerly called *Aralia papyrifera*, but is now known botanically as *Fatsia papyrifera*, the specific name being given in allusion to the use made of the pith. The tree, which rarely attains a height of more than 20 feet, is a native of the Province of Yunnan and the Island of Formosa, where it is called by the Chinese name of *tung tao*. The flowers, which are small and greenish, are produced in numerous pendulous panicles, one to three feet long, at the end of the branches. The mature leaves, supported on long petioles, are round-heart-shaped, five to seven lobed, often a foot long, and soft and flaccid. The vigorous stems contain a snowy white pith, an inch and a half in diameter, for which the tree is sought after and cultivated. This pith forms an important item in the domestic trade of China, and is not only used in making the sheets which are familiar to us when decorated with paintings, but is also largely employed in the manufacture of toys and artificial flowers. The operation of making the pith paper is not unlike that of cutting corks; the pith, after being divested of its exterior covering of woody matter, is soaked in water, and pressed into a uniform cylinder by a machine; it is afterward placed on a frame, where it lies firmly, and the workman, by means of a long, thin, very sharp knife, pares the cylinder from the circumference toward the center, and along its entire length, into a sheet. The sheet thus produced is spread out and flattened under weights until dry, or pressed out by means of an iron; the little holes or other imperfections being neatly mended with bits of mica glued underneath. The greater part of the product is sent to be dyed of various colors for the use of manufacturers of artificial flowers. The largest and best sheets, about 10 inches wide by 15 long, are mostly selected for foreign markets, after being painted by artists in Canton or Hong Kong. The refuse is used for stuffing pillows, filling the soles of shoes, and for other purposes for which a light and dry material is needed. From the uncut cylinders of pith are made toys, insects, rude mosaic pictures, and various fancy articles. The pith is also exported to some extent in the stem for the use of artificial flower makers, who find in its tissue a material which more closely than any other imitates the petals of the most delicate flowers. Dr. S. W. Williams states that under foreign guidance the native workmen have greatly improved in their manufacture of artificial flowers, making them more natural, and producing large bouquets. Chinese women wear no bonnets or other head covering, but deck themselves with natural or artificial flowers to such a degree that a crowd on a gala day appears

* Prehistoric Races of the United States, p. 236.