SCIENCE

FRIDAY, FEBRUARY 15, 1889.

SOME EXAMPLES OF MEXICAN PRE-COLUMBIAN ART.

DURING the winter of 1881 I collected on the site of the ancient city of Teotihuacan ("the place of those who adore the gods"), about forty kilometres north-eastward from the City of Mexico, and within the great valley enclosing the capital, several hundred objects of moulded and modelled terra-cotta. Some of these I gathered from the heaps of *débris* that mark the locality of this "former religious centre of the Nahuan nations;" but the greater number were secured, generally six or eight in a place, by visits to the houses of the simple agricultural people, who had found them while cultivating the neighboring gardens and fields. The soil in which these objects had reposed for a period of unknown duration, is spread around the two great *teocalli* of earth and broken stone that rise conspicuously above a broad fertile plain. The Pyramid of the Sun, the principal of these prehistoric structures, is probably the highest work of American aboriginal peoples. It overtops the celebrated mound of Cholula nearly fifty feet, and, with a base somewhat larger than that of the chief pyramid of Gizah, it rises 214 feet, nearly half the height of the Egyptian world-wonder.

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The rains of many summers have furrowed the sides of this ancient temple into irregular ravines, through the aid of which, and by exercising a little care in selecting a zigzag path, I was able to ride my tough pony to the platform upon the summit.

Among the numerous fragments of terra-cotta obtained as above described, a large proportion are one to two inches in either dimension, and represent the human head or face. Many are reliefs broken, by the action of time or otherwise, from vessels of clay, or from figures more or less complete. These faces or parts of figures are often accompanied by elaborate ornaments, such as necklaces of beads, high head-dresses of feathers, and large ear-rings, all carefully moulded or stamped in the clay. Many pieces consist simply of heads attached to a short neck, without any evidence of having formed part of a more complete figure. From all the evidence in my possession, I conclude these objects belong to a date anterior to the Spanish Conquest. By some students a portion of the types are referred to the Aztec period; another portion, to the Toltec, or even to the pre-Toltec Totonacs; but into this discussion I shall not here enter.[1]

The massive Mexican statues of basalt and trachytic lava that are displayed in the great museums in Europe and on this continent to modern apprehension are generally meaningless or grotesque. Often two round cavities stand for eyes; a crooked ridge laboriously furrowed out with stone tools is offered for an arm; or the action of the figure is so violent and crudely expressed, or the surface so overloaded with symbolic designs, that the original thought is lost to the observer of to-day, or seems the work of some unskilled and ignorant devotee. It is, however, not in the hard stone carvings that we can hope to find any adequate evidence of the mental capacity of the aboriginal sculptor. The plastic clay that abounds was all that he could desire for fixing and transmitting his conceptions. Indeed, it seems to me that no form of pristine thought should advance more rapidly and steadily toward excellence than that which may be expressed in clay. The artistic conceptions of the best minds, once formulated in this material, would be transmitted to following generations in the shape most readily comprehended, imitated, and improved, — a model and a stimulus for every succeeding artist.

Out from the dull uniformity of primitive thought from time to time glows the light of a genius whose inventions, transmitted by poetry or tradition or the plastic arts to succeeding enlightened peoples, command from them the warmest sympathy and recognition, — a genius who, like him of "the wooden statue of Sakâra," is hailed as a worthy compeer by cultivated men of the ripest civilization. The student wandering among the conventionalized art-products of the oldest dynasties at Boulaq, stands amazed before this wonderful production of a mind that wrought in the dim twilight of the history of the human race. Thereafter he feels that the possibility always exists of detecting among the works of any unenlightened people isolated examples of a high art insight. The tools of the Sakâra sculptor were of a primitive character, and he sought the soft native wood as a medium for his productions: with still ruder tools at his command, the Mexican artist found the proper medium in the potter's clay that lends itself, with all its perfections, alike to the hand of the mound-builder and to the modelling tools of Canova.

The accompanying engravings represent faces that were selected from those found at Teotihuacan to illustrate the capacity of pre-Columbian Mexican artists. They have been reproduced, without retouching, by the direct process, from my photographs of the originals in the Metropolitan Museum.

No. 1 represents a fragment of terra-cotta engraved about one-third greater than the actual size. It is a portion of a larger clay object, upon which the remarkable face has been impressed by means of a carefully prepared matrix or stamp. This matrix was

[1] For a learned and valuable contribution to our knowledge of the "terra-cotta heads of Teotihuacan," see Mrs. Zelia Nuttall's illustrated essays in the American Journal of Archæology,' 1886.

in all likelihood formed of burned clay, like hundreds that have come down from the primeval potters of Europe and America, and was itself made by an impression from an original carving of clay or other substance. The face shows slight evidences of retouching: perhaps the expressive wrinkles over the right eye were added after the figure was impressed by the matrix.

The surface of many ancient Mexican vases is loaded with ornament, such as stamped or modelled faces and heads of men and animals. This fragment may have formed such an ornament; and if the vase was designed to contain the ordinary intoxicating beverage of the Aztec peoples, — the fermented sap of the century-plant (the *Agave Americana*),— the expression of this face would be singularly appropriate, and the association recall the bacchanalian figures moulded by ancient Roman artisans upon their drinking-cups of Samian ware. Enormous quantities of this national drink — the modern pulque, the ancient *octli* — are still consumed, and special trains upon the railway convey it in hogsheads and goat-skins to the capital city from the district where this clay object was discovered.

The story the ancient artist has sought to tell by every lineament of the face is evidently one of habitual and excessive drunkenness. The swollen eyeballs, covered by thick lids; the inane unsymmetric forehead, with a curious forked wrinkle on its weak side; the hanging full and flabby cheeks; the lips, tumid and uncontrolled, enclosing a meaningless mouth, — in all these we have a consistent story of continued vinous excess. This consistency is worthy of especial attention: not a feature or line in all the face fails to give forth the same mute evidence of complete abandonment to the poison. Finally, the artist, with a stroke of genius worthy of Hogarth, has caught the very spirit of besotted helplessness by sinking the entire right side of the face out of symmetry, thus proving, that, while possessing no knowledge of our modern notions of nervous centres and facial paralysis, the pre-Columbian sculptor had developed the capacity to place upon the human face the physiological evidences of a mind and body lost in the last stages of alcoholism.

No. 2 is also a fragment of some larger object, perhaps a vase. It was moulded, as was the case in the former instance, upon a soft prepared surface of clay, by means of a matrix, but it shows no evidence of retouching. It is the face, in relief, of an individual less deeply sunk in bacchanalian indulgence; but the expression is that of a drunkard, and not that of a person in the repose of sleep or nerveless in the relaxation of death. The lips are slightly apart, and there is breath between them. The eyes are closed, but the face is under control, and its texture is firmer than in the preceding figure. It is a work of less merit than No. 1, but the artist has succeeded in delineating drunkenness in every feature, and has maintained throughout the typical stolid expression of the aboriginal American races.

No. 3 represents a face moulded upon the leg of a terra-cotta vase. This portion of the clay vessels of Southern and Central America has often been seized upon by the ancient potter as a basis for elaboration. Sometimes it is wrought to represent the head of an animal, as the crocodile or fish; while among prehistoric pottery from the Chiriqui cemeteries, northward from Panama, nearly every carefully made vase has hollow legs. A ball of clay rattles loosely in this open space, and, through a narrow aperture, may be seen moving when the vessel is shaken. The Mexican vase-legs are in some localities quite abundant, because, like the "crescent ears" of the pots of the prehistoric Italian *terramare*, their solidity preserves them where the less firm portions of the vessels have crumbled. The exigencies of the case have confined the artist of this *basso-relievo* to a triangular surface, narrowing downward nearly to a point, and he has admirably adapted his work to the predetermined shape. On the foot of what may have been an ancient pulque jar we see here represented still another and a far more cheerful phase of intoxication. The individual has reached a state of mental excitement where he is "o'er all the ills of life victorious." He "accepts the good the gods provide" with child-like joy and abandon. In the elation of the moment he half closes his eyes, but at the same time, unlike the preceding inebriates, he finds companionship in the outer world by shrewdly keeping it in view. There is no flabbiness in his cheeks and lips: the former are bunched in a jolly grimace; the latter, drawn thinly over his big teeth, broaden into a grin as successful as the narrowing margin of the vase-leg will permit. In short, we have before us the work of an aboriginal artist, who tells us successfully the story of a jolly reveller, who might be about to sing to his companions the chorus of "Willie brew'd a peck o' maut."

By turning this clay visage at various angles, it is found that the most advantageous view of the features is that from above. A large vase containing a liquid would in simple aboriginal habitations naturally be placed where it would rest below the level of the eye. Can it be possible the ancient artist wrought the model from which this vase-leg was moulded, conscious he was addressing eyes that would look from above upon his completed work?

With evidence before us such as that here detailed of the comparatively advanced culture in one direction of the old Mexican peoples, and of the capacity of some of their artists to deal successfully with complex questions in designing and modelling figures expressing conditions of the human mind, does it not seem probable that upon our southern border a rich field and many surprises await the patient scientific investigator? — a field that is all the more important to the anthropologist, because embedded in it is the history of a culture that may be autochthonous; and that is of all the more moment to us, because this culture grew through many centuries, subject to the developing forces of an environment in some important elements similar to that which is to-day modifying us and converting us into "Americans."

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STREET-RAILWAY MEN VISIT AN ELECTRIC RAILWAY.

ON Tuesday, Feb. 5, there was a gathering at Boston, Mass., of street-railway men of New England, who had come from all quarters of the six New England States. The object of the gathering was to inspect the electric branch of the West End Road at Boston, installed by the Sprague Electric Railway and Motor Company of New York. The party was met by Messrs. Blake & Sawyer, and the start was soon made from the Park Square end of the line in a number of electric cars which President Whitney of the West End Road had provided for the purpose. The cars were quickly filled by the street-railway men, and the departure made from Park Square in short order out to Boylston Street. The first stop was made at the power-station of the road, situated at Allston, where the visitors disembarked, and were shown the generating-station for the electricity used in operating the cars. On entering the main room, and passing by the two high-speed Armington & Sims engines of 200 horse-power each, — one, though running, being so noiseless in its action that its motion passed almost unnoticed, — the four dynamos, of 80,000 watts capacity each, engaged the attention of the party. From each dynamo there are three leads passing under the floor to the switch-board, where connection is made by separate conductors to the underground conduit and overhead system. This switch-board and each regulator have for their bases an insulating compound to which they are fastened, and each regulator-shaft carries a gear; so that, by means of a rack which meshes into all four gears, the four dynamos may be regulated by one operation. Still higher on the wall are the safety fusible strips mounted on slate. At the top of the switch-board are placed four improved lightning-arresters resting on insulated brackets. These arresters consist of a large electro-magnet, which may be short-circuited in fine weather by a switch. From the terminal connected with the outside line there is a circuit with an alternative path to the ground, with the use of the usual break, an electro-magnet. To a lightning-current passing over the line, the large electro-magnet acts like a choking coil, and offers a large resistance; and the current, taking the alternative path, jumps over the air-space, when the electro-magnet, operating, breaks the circuit, thus extinguishing the arc. The power-station is lighted by a large number of electroliers, under control in groups of five, at a switch-board at one end of the building. The boiler-house has three 150-horse-power steel tubular boilers, with Jarvis setting, feed-water heater, injector, steam-pump, etc. The back wall of the power-house is built with a view to its extension in the rear, so that the capacity at the station can be