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."

ROBERT H. LAMBORN.

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

doubled, the position of the chimney being in the centre of the future station. Adjoining the power-station a new car-house has been erected, with capacity for twenty-six cars. The cars, when in this house, rest on skeleton tracks, under which the inspectors can walk, and, by aid of incandescent lamps with flexible connections, can examine and inspect the machinery of each car. After the party had fully examined the workings of the power-station, and listened to the explanations of its operation from the engineer in charge, they reboarded the electric cars, and were carried quickly out Beacon Street and Harvard Avenue to the terminus of the road at Oak Square, Brighton. To a great many in the party this trip was the first ever made on an electric railway, and the exclamations of surprise and delight were universal. On the return trip the cars were speeded to ten or twelve miles an hour in places, and much praise was bestowed upon the easy starting, which was prompt though without jar, the complete control over the car, and the ease of the car in rounding curves and in speeding. Each of the cars was brilliantly lighted by five incandescent lights of 16 candle-power each, — three inside the car, and one on each platform. These lamps had the municipal cut-out; and, when one breaks, the increase of candle-power in the remainder calls the attention of the conductor, who inserts a new lamp. The visitors left Boston for their respective homes full of enthusiasm over the application of electricity to street-railways, and with a better knowledge of the advantages which electric power has for this purpose over any other power.

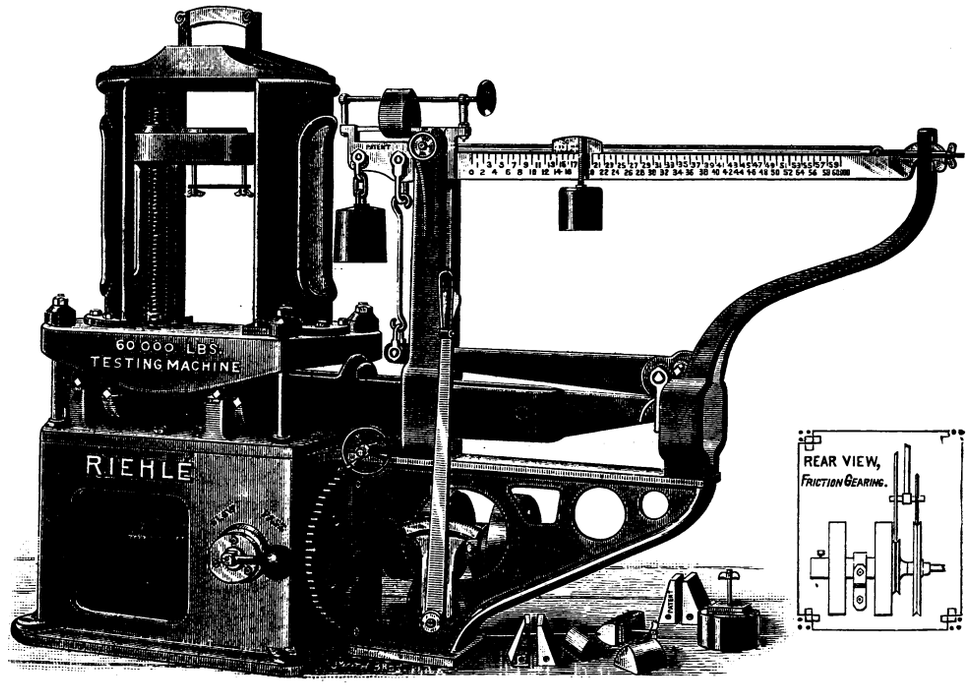
THE RIEHLÉ TESTING-MACHINE.

TESTING-MACHINES have become a necessary part of the equipment of all manufacturing establishments and constructive works, government and private, where the strength of materials must be accurately determined. Among the testing-machines now in use, those made by the firm of Riehlé Brothers of Philadelphia stand prominent as examples of good workmanship, strength, accuracy, and convenience in use. The accompanying illustration shows one of these machines. It is a vertical screw-power machine for testing materials by tensile, transverse, and compression strains, and has a capacity of 60,000 pounds. Other machines made by the same firm range in capacity from 10,000 to 200,000 pounds. The levers on the machines of all capacities are adjusted to the United States Government standard.

The machine shown in the engraving is adapted for those whose requirements do not call for one of greater capacity. It weighs about 3,500 pounds, is 6 feet in height, and occupies a space 8 feet long by $2\frac{1}{2}$ feet wide.

For tensile strength, the machine will test specimens up to 18 inches in length, $1\frac{1}{4}$ inches square, $1\frac{3}{8}$ inches in diameter if round, and $2\frac{3}{8}$ by 1 inch if flat, allowing for a 25-per-cent elongation in the longest specimens, and more for those of shorter length. For transverse strains, it will test specimens from 6 to 20 inches in length; and for compression, specimens up to 8 inches long and surfaces up to 6 inches in diameter. The pulling head has a movement of 23 inches. The machine has four different speeds for tensile and transverse tests, and two for compression, as follows: transverse and tensile, 4 inches per minute, 1 inch per minute, 1 inch in $3\frac{1}{2}$ minutes, and 1 inch in 10 minutes; compression or reversing, 4 inches per minute, and 1 inch in $3\frac{1}{8}$ minutes.

Power is applied by levers and friction-pulleys for starting, stopping, and reversing; and for changing the speeds, a hand-wheel and tumbling ball are used. In compression tests, and in tests of material not ductile, when the pressure is run up rapidly, there is an arrangement of friction-gears, similar to those of a hoisting-engine, which gives an extremely slow and steady motion to the screw, thus enabling the operator to make the test with ease and accuracy. The bearings are of hardened steel balls, which do away with much of the friction incident to this class of testing-machines.



RIEHLÉ SCREW-POWER TESTING-MACHINE.

THE FLEISCHMANN SYSTEM OF GARBAGE-DISPOSAL.

ONE of the systems of garbage-disposal which seems to be one of the best is that known as the Fleischmann, and is now in practical operation in Buffalo. In speaking of this system, the *Sanitary Inspector* says: —

"The Fleischmann system of garbage-extraction consists principally of two processes. The garbage, as it is hauled in, is shovelled through man-holes into driers below. There are two of these driers, each receiving at one charge 5,000 pounds of garbage. Each drier consists of a double-walled metallic cylinder, between the walls of which steam at a pressure of about eighty pounds is admitted. In the interior of each drier, a rake revolves, constantly stirring up the garbage. These rakes are composed of steam-pipes into which steam of the same pressure is admitted, but the steam is not admitted into the chamber which contains the garbage. The steam which arises by the drying of the garbage is drawn out of