

THE ZAPOTECAN TOMBS UNEARTHED.

BY WALTER L. BEASLEY.

Professor Marshall H. Saville, of the American Museum of Natural History, has just returned from Mexico, where he has brought to a close the four years of exploration in Southern Mexico planned by the Museum. Two of these years were spent in investigating the famous ruins of Mitla, while the last two seasons' work has been devoted to excavating a number of huge burial mounds in the State of Oaxaca. The funds for the expedition were furnished through the liberality of the Duke of Loubat. At Oaxaca a series of spacious and elaborate tombs were uncovered, wherein were found a number of noteworthy and surprising objects of great archaeological interest and value. These afford for the first time a vivid glimpse of the civilization of the little-known race, the ancient Zapotecs, a powerful Indian tribe who had developed a peculiar culture, differing in many respects from the Aztecs of Mexico, and the Maya of Yucatan. The relation of their culture to that of the other Mexican tribes, an important archaeological problem, can now be more narrowly studied than ever before.

Professor Saville's brilliant discoveries, when fully reported on, will unquestionably be one of the most important contributions to American archaeology made in recent years. The excavations of the past and preceding winter were carried on in two places near the city of Oaxaca, Xoxocotlan and Cuilapa, all in the area of Zapotecan culture. Not far distant from these points is a range of hills on which are situated the remains of a great fortified city, known as Monte Alban, which is thought was probably the capital of the old Zapotecan empire. This entire section is dotted with mounds indicating a thickly populated province in former times. The mounds vary in height from 6 to 75 feet. A number are in the form of a pyramid, others rectangular in shape, and a few circular. Many had been plowed over, and thus their original outlines were destroyed. The excavations of the mounds revealed much that was new and surprising. The doors of the tombs were sealed by a large stone. A peculiar feature of the ruins were cement floors, sometimes one above the other and about a foot apart, indicating a structure on top. A flight of stone steps led upward in several instances to the platform or floor above. The tombs were built of slabs of stone, neatly dressed, covered with stucco and were painted red. The lintel over the entrances consisted of a long block of stone, the outer part painted in red. Above this were stucco decorations, sculptures, hieroglyphics, and in some instances funeral urns of terra cotta.

In the principal excavation made at Xoxo a trench was carried through the entire mound. Here were found the cement floors and adobe construction characteristic of other mounds. The door was sealed with a large stone. The façade of the front wall was in the form of a frame, in which were placed five terra cotta funeral urns. On either side of the one in the center was a death's head of stucco. These funeral urns, which had been fastened to the wall with cement, were the covers of boxes of terra cotta resting on four feet, the corner of each box being decorated with symbolic faces. The inside of the tomb was found literally covered with food vessels, incense burners and the remains of a number of skeletons. The niches on either side of the walls also contained human remains. All of the bones and skulls were painted red. There were several decapitated heads on the floor. The walls of the chamber were formerly entirely covered with plaster, but during the lapse of centuries, probably on account of the action of earthquakes, the greater part had fallen off. They had, originally, been entirely decorated with paintings in various bright colors,

traces of which were distinctly visible. Over these bright colored paintings a thin coat of stucco had been laid upon which in black outlines was painted a series of human figures in the costume of ancient Mexico. The most important feature in this and many of the tombs was the hieroglyphic inscriptions, found on the stone door lintel and wall chambers in a form of writ-

excavations is the fact that they fully confirm the writings of the old Spanish historians of that age as to the strange and elaborate burial customs employed by the Zapotecs. Also that the great underground tombs are properly ossuaries or places where the bones only of the dead were deposited. After a certain lapse of time, when the flesh had decayed, with elaborate ceremony the bones and decapitated heads were painted red and placed in the tomb with food and incense. Funeral urns were found to have been placed in series of five in front of the tombs. One problem was definitely settled as to the exact character of the mounds; those of rectangular shape were found to be burial places and contained the most important tombs, while the pyramidal ones were temple structures. The first detailed account of these explorations herein outlined are now given by Mr. Saville before the International Congress of Americanists at the Museum, where new archaeological and ethnological problems and the early history of the two Americas are being discussed. This will be followed by the publication of two illustrated memoirs, one on the ruins of Mitla and the other on the excavations of the Zapotecan tombs; these will be the latest and most exhaustive works on the culture of the ancient civilizations of Mexico in existence.



ZAPOTECAN TOMB AT CUILAPA.

ing entirely different from any heretofore known in Mexico, and the first ever found in Zapotecan territory. When deciphered these inscriptions will doubtless shed valuable new light upon this ancient race.

At Cuilapa, seven miles southwest of the town of Oaxaca, seven large chambers and a like number of small stone graves were uncovered. The excavations of the mounds at Cuilapa were especially noted for the



TERRA COTTA FUNERAL URNS AND BURIAL FIGURES.

great numbers of magnificent jadeite ornaments and other votive offerings found. These embraced beautifully carved breast ornaments, necklaces, beads, earrings, miniature idols and various symbolic figures. Also fragments of mosaic work were found, the most interesting of which are two small circular mirrors made of bits of highly polished hematite cemented to thin disks of pottery. A significant point brought out by the

A New Type of Electric Locomotive.

Some interesting tests have been carried out with a novel and interesting type of high-speed electric locomotive designed by Mr. Walter Reichel, the chief engineer to Messrs. Siemens & Halske, the eminent firm of electrical engineers, which in conjunction with the Allgemeine Elektrizitäts-Gesellschaft has been carrying out the elaborate experiments in connection with high-speed electric traction. The body of this new locomotive is carried on two four-wheeled bogies, and to each axle a motor is fitted, making four motors in all. The special feature of this engine is that the motors receive the current direct from the supply trolley at 10,000 volts potential, and the fitting of a motor to each axle dispenses with transformers and enables the weight to be considerably reduced, with a corresponding reduction of energy consumption. The reason for building a locomotive instead of another automobile car, for these high-speed trials, was simply the lower cost. Owing to the imperfections of the permanent way, the maximum

speed attained in the trials was only 105 kilometers (66 miles) an hour, but they afforded ample proof of the feasibility of using motors taking current at very much higher pressures than have hitherto been attempted. Pressures extending up to 11,000 volts were used in the trials without giving rise to difficulties of any kind. According to the engineer, the substitution of these motors in the Siemens & Halske high-speed car employed in last year's trials for the 1150-volt motors and transformers then used, would reduce the weight from 96 to 76 metric tons. This car attained a speed of 160 kilometers in the former trials, and if, when carrying 50 passengers, it were coupled to a 42-ton car without motor equipment, the total weight, taking 7 tons as the weight of 100 passengers, would amount to 125 tons, or 1.25 ton per passenger.

Power Exerted by Water.

The tremendous power exerted by water in violent motion is well shown by some experiments carried out by English engineers to determine the stress exerted upon the foundations of a lighthouse. Thomas Stevenson discovered that at Skerryvore and Bell Rock pressures of 6,083 pounds per square foot, and 3,013 pounds, respectively, were to be encountered in ordinary weather. This is only about 42 pounds per square inch, and is doubtless much exceeded in severe storms.



TEROPLE MOUND.