

Being now satisfied with the trustworthy nature of his apparatus, Prof. Nipher determined to apply it to the determination of the distribution of pressure over a large pressure board. For this purpose the board, which was a wooden one, 4 feet long by 3 feet wide, was mounted on the roof of a railway carriage. It was bolted to a vertical iron pipe, and the couple required to keep it perpendicular to the direction of the wind was measured by a spring balance. On opposite sides of the board, and at the centre of one of the 108 4-inch squares into which the board was divided, two disc collectors were fixed and connected by rubber tubes with their respective gauges. The latter, together with a third, which was used as a level, were mounted on a board which was rigidly attached to a heavy pendulum within the carriage. The speed of the train varied generally between twenty and fifty miles an hour, and was checked by direct observations.

The total action on the board is the result of an increase of pressure in front and a decrease behind. Both the increase and the decrease are shown by this series of experiments to be proportional to the force necessary to hold the board to the wind as indicated by the spring balance. Further, the force measured in this way differs from that deduced from the data given by the collectors by no more than 1 per cent., and although this may be in a measure accidental, it affords a confirmation of the accuracy of Prof. Nipher's method. On both sides of the board the difference from the ordinary pressure becomes less as the periphery is approached, although there is some evidence of a minimum excess at the centre of the front face. Prof. Nipher gives a few notes on the application of the device to the study of pressure variation around a building. It is to be hoped that such developments as this will be realised. At present it is too early to estimate the full importance of these researches as a contribution to the study of anemometry; but the idea is full of promise, and the simplicity of the apparatus is certainly a great point in its favour.

AN ENCHANTED MESA.¹

THE pueblo of Acoma, in Western Central New Mexico, is the oldest settlement within the limits of the United States. Many of the walls that still stand on that beetling peñol were seen by Coronado during his marvellous journey in 1540, and even then they were centuries old.

The valley of Acoma has been described as "the Garden of the Gods multiplied by ten, and with ten equal but other wonders thrown in; plus a human interest, an archaeological value, an atmosphere of romance and mystery"; and the comparison has not been overdrawn. Stretching away for miles lies a beautiful level plain clothed in grama and bound on every side by mesas of variegated sandstone rising precipitously from 300 to 400 feet, and relieved by minarets and pinnacles and domes and many other features of nature's architecture.

None of these great rock-tables is so precipitous, so awe-inspiring, and seemingly so out of place as the majestic isolated Katzimo or Enchanted Mesa, which rises 430 feet from the middle of the plain as if too proud to keep company with its fellows; and this was one of the many wonderful homesites of the Acomas during their wanderings from the mystic Shipäpu in the far north to their present lofty dwelling-place.

Native tradition, as distinguished from myth, when uninfused by Caucasian contact, may usually be relied on even to the extent of disproving or verifying that which purports to be historical testimony. The Acoma Indians have handed down from shaman to novitiate, from father to son, in true prescriptive fashion for many generations, the story that Katzimo was once the home of their ancestors, but during a great convulsion of nature, at a time when most of the inhabitants were at work in their fields below, an immense rocky mass became freed from

the friable wall of the cliff, destroying the only trail to the summit and leaving a few old women to perish on the inaccessible height. What more, then, could be necessary to enwrap the place for ever after in the mystery of enchantment?

This tradition was recorded in its native purity some twelve years ago by Mr. Charles F. Lummis, and the same story was repeated by Acoma lips to the present writer while conducting a reconnaissance of the pueblos in the autumn of 1895. During this visit, desiring to test the verity of the tradition, a trip was made to the base of Katzimo, where a careful examination of the talus (especially where it is piled high about the foot of the great south-western cleft (Fig. 1) up which the ancient pathway was reputed to have wound its course) was rewarded by the discovery of numerous fragments of pottery of very ancient type, some of which were decorated in a vitreous glaze, an art now lost to Pueblo potters. The talus at this point rises to a height of 224 feet above the plain, and therefore slightly more than half-way up the mesa side. It is composed largely of earth, which could have been deposited there in no other way whatsoever than by washing from the summit during periods of storm through many centuries. An examination of the trail to a point within 60 feet of the top exhibited traces of what were evidently the hand and foot holes that had once aided in the ascent of the ancient trail, (Fig. 2) as at Acoma to-day. Even then the indi-

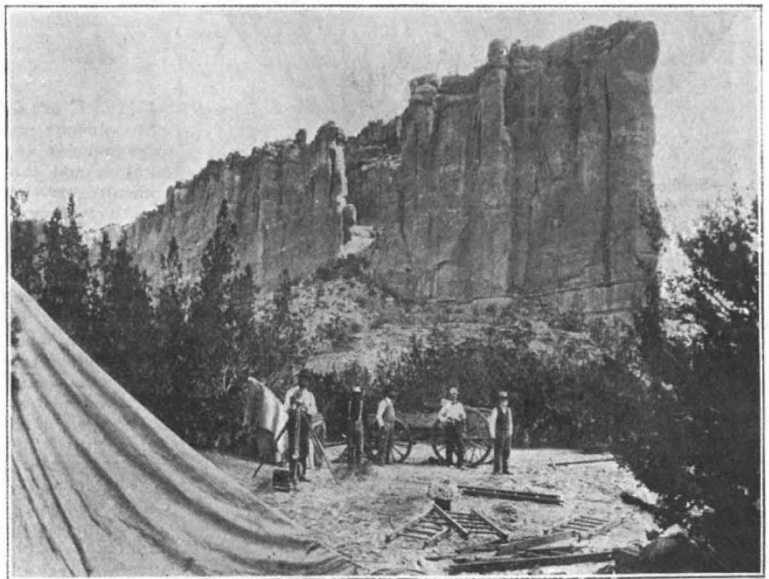


FIG. 1.—The Enchanted Mesa—the Great South-western Cleft and Talus Heap.

cations of the former occupancy of the Enchanted Mesa were regarded as sufficient, and that another one of many native traditions had been verified by archaeological proof.

More recently the author visited Katzimo a second time, on this occasion with Major George H. Pradt, Mr. A. C. Vroman, and Mr. H. C. Hayt, in order to determine what additional data of an archaeological nature might be gathered by an examination of the summit.

The ascent of the talus, in which the potsherd had been observed in such considerable quantities two years previously, was made in a few minutes, the ladders, ropes, and photographic and surveying instruments being carried with some effort, since climbing, heavily laden, at an altitude of 6000 feet, in a broiling sun, is no trifling labour; but the real work began when the beginning of the rocky slope of the cleft was reached. One member of the party, taking the lead, dragged the end of a rope to a convenient landing place, where a dwarf piñon finds sufficient nourishment from the storm-water and sand from above to eke out a precarious existence. Fastening the rope to the tree, the outfit was hauled up, and the other members of the party found a ready means of ascent. The next landing was several feet above, at the base of a rather steep pitch of about twelve feet. This wall, although somewhat difficult to scale,

¹ Abridged from a paper by Mr. F. W. Hodge, of the United States Bureau of American Ethnology, in the *National Geographic Magazine*.

may be climbed with greater or less safety by the aid of several small holes in its face. These holes were doubtless made artificially, but as the narrow pathway at this point is now a drainage course during periods of storm, the soft sandstone has become so much eroded that they have apparently lost their former shape.

The summit of Encantada was reached after some difficulty. It has been swept and carved and swept again by the winds and rains of centuries since the ancestors of the simple Acomas climbed the ladder-trail of which we found the traces. The pinnacled floor has not always appeared as it is to-day, for it was once thickly mantled by the sherd-strewn soil that now forms a goodly part of the great talus heaps below.

There is little wonder, then, that the party despaired of finding even a single relic when they had reached the top of the trail and looked about at the destruction wrought; and yet they had been on the summit only a few minutes when a sherd of pottery of very ancient type, much cracked by weathering, was found. This fragment is of plain grey ware, quite coarse in texture, with a dégraisant of white sand.



FIG. 2.—The Great Sandstone Cleft of the Mesa. Through this cleft the traditional trail passed, and distinct traces of it were found on each side of the vertical fissure to the right of the upper ladder.

During the twenty hours spent on the summit, every opportunity was taken of making a critical study of the general features of the top of Katziño throughout the 2500 feet of its length, special consideration being devoted to the topography of the site, the erosion, the earthy deposits, the drainage, and the great cedars that stand gaunt and bare or lie prone and decaying because their means of subsistence have been so long washed away, and the party was forced to the conclusion that had house-walls, whether of stone or adobe, ever existed on the summit at a reasonably remote period, there was no possibility that any trace of them could have remained to this day. Nevertheless, the abundance of ancient relics in the talus, the distinct remains of the ladder-trail, the specimens found on the summit coupled with the destruction wrought by nature, the tradition itself—all testify to the former habitation of the site.

To the Acomas Katziño is still enchanted, and as a subject in the study of mysticism the man of science must yet regard it. The law of a millennium is not undone by a few hours of iconoclasm.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—On March 15, Convocation will consider some alterations in the statute relating to the Aldrichian Demonstratorship in Comparative Anatomy, rendered vacant by the resignation of Dr. Blaxland Benham, who has been appointed Professor of Biology at Otago, New Zealand. Mr. Gilbert Bourne, of New College, has, in the meantime, been nominated as Lecturer in Comparative Anatomy, and his name will be submitted to Convocation on the same day.

Dr. Benham will be entertained at a farewell dinner by his colleagues on Friday.

The Junior Scientific Club met on Wednesday evening, March 9. Mr. A. W. S. Fisher read a paper on the salmon, and Mr. T. Annandale discussed the habits of British Amphibia. The officers for next term were elected. The Club proposes to hold its biennial conversazione next term, and arrangements are being pushed forward rapidly.

The cast of the skeleton of Iguanodon, which has been purchased by subscription, has now been set up in the court of the University Museum. Some valuable casts of other fossil reptiles have also been recently added to the collections.

CAMBRIDGE.—The honorary degree of Doctor of Science is to be conferred on Dr. Wilhelm Pfeffer, Professor of Botany in the University of Leipzig, and Croonian Lecturer at the Royal Society.

The Agricultural Examinations Syndicate report that ten candidates presented themselves for Part I., and nine for Part II. of the Examination for the diploma of the University. Six candidates were successful in both parts. The numbers show some increase on those of past years.

Regulations for the Gedge Prize in Physiology, taken in a broad sense, have been published. The prize will be given biennially for an original memoir or essay, and will consist of two years' interest on the capital sum of 1000*l.* Candidates must have worked in the University laboratories during six terms, and be of at least five, and at most seven, years' standing from matriculation.

The application for the recognition of St. Edmund's Hostel as a place of residence for students preparing for the secular priesthood of the Church of Rome, led to an animated discussion in the Senate on March 3. The weight of opinion was in favour of granting the application.

THE Senatus Academicus of the University of Edinburgh have resolved to offer the honorary degree of Doctor of Laws to Mr. Horace T. Brown, F.R.S.

PRESIDENT CHARLES DE GARMO, of Swarthmore College, Pa., has been elected to the professorship of the science and art of education at Cornell University, rendered vacant by the resignation of Prof. S. G. Williams; and Prof. Herbert Hibbard, of the University of Minnesota, has been elected assistant professor of mechanical engineering of railways and principal of the graduate school of railway, mechanical engineering.

NEARLY 55 per cent. of the net total of the Estimates for Civil Services, agreed to by the House of Commons on March 3, arises under the class of education, science and art, which shows a net increase of 457,094*l.* over the grants of last Session. To the total of the class—viz. 11,965,796*l.*—the three Public Education Estimates contribute 11,028,776*l.*, being a net increase of 425,903*l.* The chief remaining increase is 22,663*l.* under the Science and Art Department Estimate (mainly for additional payments to science schools for attendance and on results). An important change has been effected in transferring to the Education Departments, England and Scotland, the grants, &c., for drawing in elementary schools, hitherto borne on the Science and Art Department's Vote, and in transferring to the Scotch Education Department the other Science and Art grants in Scotland.

A NOTEWORTHY feature of the little volume of announcements of classes held in the Northampton Institute, Clerkenwell, is a table of special courses adapted to various classes of students. By referring to this table, any young artisan can see what courses he ought to take to educate himself in the scientific principles of his trade. Similar guides to study, now often inserted in the prospectuses of technical institutes, are of great value in inducing students to take up systematic courses of instruction,