

nearly those of the Dead Lodge Canyon on the Red Deer River. Two things have especially impressed me: First, the close resemblance between the Judith River Beds and the Belly River series in the Dead Lodge Canyon where the Fort Pierre on top and Belly River series below are nearly 500 feet thick. Towards its lower end a sandstone like the Eagle is exposed. The second is the finding of a footed ischium of a trachodont in the same bed from which the type of *Trachodon mirabilis*, of Leidy, was discovered, the same teeth to which he gave the name lying around the ischium. That evidently belongs to Lambe's *Stephanosaurus marginatus*: a crested trachodont. My party has already discovered three trachodonts in the Belly River series, two with footed ischia and one Lambe's *Gryposaurus notabilis*, has an uncrested head. We have only found among our forty tons of fossil dinosaurs collected there a single species of *Trachodon*. The one we mounted from the Edmonton is certainly one. Is it possible, then, that Leidy's *Trachodon mirabilis* was a crested duck-bill? This is a question impossible of solution, as the type tooth might have come from one of three or four of the Trachodonts of the Belly River series. Then the use by Marsh of two horn cores to found the genus *Ceratops* on and the family *Ceratopsia* rests on a shaky foundation along with Cope's *Monoclonius*. These horns of Marsh might have come from any of the horned dinosaurs of that time except *Centrosaurus*, and in spite of the splendid and complete skulls of horned dinosaurs we have secured from the Belly River series we know nothing of *Monoclonius* except what little, if anything, can be learned from the types.

Then the richness of the fauna in genera and species both of duck-billed, plated, horned and carnivorous dinosaurs, was at high tide during Belly River time. The formation, therefore, must have covered a wide area, and it is not surprising to know that Brown got a *Gryposaurus* skull in New Mexico. A thorough exploration of the beds in Montana will doubtless yield rich returns. It is also interesting to note that I got a plated dinosaur

some years ago in the Niobrara Chalk of Kansas, described by Weiland, doubtless a near relative of Lambe's *Europlocephalus* from the Red Deer River. Evidently then the Cretaceous dinosaurs continued to live and thrive through Cretaceous time in the west, but few bones found lodgment in the ocean sediment of thousands of feet of Dakota, Fort Benton, Niobrara, Fort Pierre and Fox Hills groups. It appears evident, too, that the life of the Pierre ocean was continuous with the Belly River, whose shores were only raised a few feet above tide water. Many Plesiosaurs found entrance to the freshwater lakes and mingled their bones with the reptilian fauna. Hatcher himself once told me he believed all the beds of the Judith River region were Pierre from top to bottom, though I suppose land, fresh water and marine beds will always be known by different names.

CHARLES H. STERNBERG

THE TRAVERTINE RECORD OF BLAKE SEA

AN outlying mass of fragmental granite projects from a spur of the Santa Rosa Mountains into the Cahuilla basin in southeastern California, the crest of the rocks rising above the ancient shore line of Blake Sea, which filled the basin to a level, something above that of present high tide in the Gulf of California.¹

This cape is designated as "Travertine Point" in our publications, as the surface of the granite boulders is covered to a varying depth with dendritic and lithoid tufa.² Some marks and figures presumably carved by Indians in the travertine have long been known and were seen by us on our first visit to the place in 1906. In the continuation of our work on the Salton Sea it was realized that these figures might possibly yield some evidence as to the duration, and variations in level of the ancient Blake Sea, and of the smaller modern Salton Lake.

A visit to the formation was accordingly

¹ See Plate 1, "The Salton Sea," MacDougal, et al., Publ. Carnegie Institution of Washington, No. 193, 1914.

² See Jones, J. C., "The Geologic History of Lake Lahontan," SCIENCE, XL, p. 827, 1914.

made in March, 1915, and a careful inspection showed that the number of carvings on the rock was very large, and that some have been coated over to such depth that they may be made out only in the most favorable illumination or shading. Others show as deep furrows with weathered surfaces, visible at a hundred yards or more, while none of recent origin have yet been found.

A slice of the travertine extending across four lines of a complex pictograph and down to the granite base was cut out, and the surfaces of the sample are now being polished and prepared for critical examination. Some time may be required to determine the degree of uniformity, or of differentiation into layers which might indicate more than one period of deposition, and a series of such samples may be necessary for the reconstruction of the history of Blake Sea and of Salton Lake.

The carvings were apparently not made in the granite, but in the travertine, and extended study may be necessary to determine the depth at which the figures were made, and what deposition and weathering has since taken place. The facts favor the presumption that Blake Sea was a fluctuating body of water and not a continuously receding one. The final proof of the matter will rest chiefly upon biological evidence concerning the activities of organisms in connection with the deposition of tufas, to which the botanist may be expected to contribute.

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SOCIETIES AND ACADEMIES

THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON

At the 486th meeting of the society, held April 6, Dr. Gudmund Hatt, of the University of Copenhagen, read a paper entitled "At Home with Lapps and Reindeer," illustrated with lantern slides. About 6,000 of the 30,000 Lapps are nomads and retain much of their old culture, because old habits and thoughts are necessarily connected with their nomadic life. The Lappish world is full of supernatural powers that seem to be recruited from the ghosts of the dead. An underground people, generally invisible, called "saivo," are be-

lieved to be reindeer breeders. The shaman sometimes goes to the saivo world to secure the recovery of a sick person and until recently offerings were made to it to prolong life. Vagrant spirits, "muones," bring sickness. There are also local spirits, not spirits of the dead, who inhabit and own certain localities. Every part of the lodge is connected with supernatural powers. The place behind the fire is sacred. Lapps are considered great magicians, the main purposes of their art being to bring sickness and death and to cure sickness. The evil influences that bring sickness are driven away by terrifying the hostile power. Again, the sick part may be touched by the object from which the evil came, in order to cure it. The idea of reindeer luck is characteristic. Until lately, sacrifices were in vogue to insure it. No bone must be broken in the sacrifices of reindeer. The bones were formerly sometimes placed in a spring. Formerly the same deity presided over the birth of children and of reindeer calves. To take the life of a human being will buy reindeer luck.

At the 487th regular and 36th annual meeting of the society, held April 20, Dr. Henry R. Evans, of the Bureau of Education, read a paper on "The Old and New Magic." In addition to explanations given in his book under this title, the doctor explained that thought transference and even hypnotism might be the real explanation of the phenomena exhibited by so-called mediums and clairvoyants. Dr. Gudmund Hatt said that Lapps caused and cured sickness through hypnotism and practised second sight. Mr. Mooney gave instances of hypnotism as practised by medicine men among American Indians. Mr. J. N. B. Hewitt, Mr. Francis La Flesche, and Dr. E. L. Morgan related their observations upon sleight-of-hand and other tricks practised among the Iroquois, the Pawnees, and other tribes. For example, "arrows" made of pliable vines were swallowed; also other objects by means of a tube inserted in the throat. Iroquois jugglers forfeited their life unless each produced a new trick at the annual meeting of the jugglers and correctly told the dreams of others.

The following officers were elected for the ensuing year: Dr. John R. Swanton, President; Dr. I. M. Casanowicz, Vice-president; Dr. Daniel Folkmar, Secretary; Mr. J. N. B. Hewitt, Treasurer; and Messrs. William A. Babcock, Francis La Flesche, George C. Maynard and Felix Neumann, and Dr. Edwin L. Morgan were elected Councilors.

DANIEL FOLKMAR,
Secretary