logical laboratory at Fairport, Iowa, has resigned to become assistant professor of zoology at the University of Southern California.

PROFESSOR T. J. TALBERT, superintendent of farmer's institutes and extension schools and leader of subject matter specialists, Division of Extension, Kansas State Agricultural College, has been appointed professor of horticulture and chairman of the department of horticulture at the University of Missouri.

DISCUSSION AND CORRESPONDENCE

THE PALEOPATHOLOGY OF THE PARASUCHIANS

STUDENTS of vertebrate paleontology have long been aware of the presence of curious knob-like eminences on the snouts of the Triassic crocodile-like, elongate reptiles which Huxley regarded as the Parasuchia, but are now known as the Phytosauria with an organization quite remote from that of the Crocodilia. No adequate explanation of these eminences has ever been given although the writer referred to one of them as a callus following a fracture; an interpretation from which he was dissuaded by Huene. Recently Dr. Case has written me about a very curious example of these eminences and Professor O. Abel of Vienna has discussed[1] in a very interesting manner the nature of all the eminences, regarding them as lesions following injuries received in combat, and as occurring more frequently in the male. The ensuing complexities of a taxonomic nature are startling, and if correct pathological disturbances will reduce a lot of scientific names to the limbo of useless terms.

But I am not at all sure that Abel is correct. His argument is from analogy only. He has given not one positive anatomical or pathological evidence to prove that the eminences are "Bissverletzungen," or lesions of a traumatic nature with often huge necrotic sinuses, if they are at all pathological. The weakness of Abel's argument consists in the fact that the eminences are always in the median line and are always fairly symmetrical, at least in all the examples known to me. So before Abel's conclusions are accepted and the taxonomy of the Phytosauria revised we must have definite proof that these eminences really are pathological in nature and not something else. They *may* be pathological lesions, but we do not *know* they are, and there are methods of determining this point within reasonable limits of certainty, and that is by a histological comparison of the bone from one of the eminences, with normal bone elsewhere on the snout.

We have sufficient knowledge of the histology of fossil bone through the studies of Kölliker, Seitz and Schaffer, whose work is reviewed in my forthcoming volume on "Paleopathology," and to which I have made a number of additions. From the standpoint of histology the bone tissue of ancient forms, and of modern fishes, consists largely of an osteoid tissue which in normal fossil bone has few, widely-scattered lacunæ, scant lamellæ and little or no evidences of an Haversian arrangement. In fossil pathologic bone, however, the lacunæ become more numerous, the lamellæ more prominent, and numerous concentric arrangements, recalling Haversian systems, are apparent. I have found this to be true in callosites of the Permian reptiles, in the Comanchic dinosaurs, in the Pleistocene cats, in pre-Columbian man and in the modern bison, so we may say the phenomena are universal. Foote has recorded a similar fact for the modern bull-frog, in a case of a fracture of the femur.

Until positive evidence of this kind is forthcoming Abel's conclusions must await acceptance. The matter is far too important for hasty judgment. The numerous fossil pathological lesions I have studied are so different from the symmetrical, median eminences seen in the Phytosauria that I hesitate to accept them as callosities. We usually find a lack of symmetry in pathological lesions, especially in those of a traumatic character.

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[1] O. Abel: Die Schnauzenverletzungen der Parasuchier und ihre biologische Bedeutung (mit 10 Textfiguren). *Paleontologische Zeitschrift*, Bd. V, Heft 1, Juni 1922, pp. 26-57.