Mackin, with the collaboration of Johnson and aided by Lucke and others, and Bogert, aided by Wiringa, have made extended studies of the behavior of streams entering the arid basin from the bordering ranges. The evidence indicates (a) that the heavily laden streams have swung widely over the basin floor, carving rock fans and pediments by the process of lateral planation; (b) that partially completed pediments constitute a series of smoothly planed rock terraces, each terrace being covered with a veneer of gravel laid down by the laterally shifting stream which carved it; (c) that remnants of pediments largely destroyed by subsequent erosion constitute high-level mesas or table-lands, each similarly capped by gravels; (d) that study of the gravels enables one to determine what stream was responsible for the carving of each terrace or mesa; and (e) to trace a former course of the Shoshone River across a mesa top and through a gap in Pryor Mountains long since abandoned by that stream; (f) that the terraces and mesas are not to be regarded as peneplanes or partial peneplanes, and that they do not necessarily indicate either successive changes in the relative position of general base level, or successive local uplifts of the adjacent mountain ranges; but may record variations in the graded condition of streams due to climatic or other causes; and (g) that long-range correlations of these erosion surface remnants are of doubtful validity. New topographic maps of some of the forms studied have been prepared and will be placed on exhibition, together with other products of the investigation.

Time measurements of an ice readvance at Littleton, N. H.: RICHARD J. LOUGEE (introduced by Charles P. Berkey). The lower dam at fifteen-mile Falls on the Connecticut River in Littleton, N. H., lies within the belt of the Littleton-Bethlehem moraine. Near the site of the dam in 1921 Antevs measured two varved clay sections a mile apart. The bottom varves of each rested on till, but the lowest varve of the section nearest the dam was about 280 years younger than the bottom varve of the other exposure. Antevs concluded that the ice had readvanced over the dam site and finally retreated some 280 years after the first uncovering. During construction on the dam site in 1930 Mr. I. B. Crosby noted two till sheets, each 30 to 80 feet thick, separated by a 30-foot bed of lacustrine sand. No varved clay was exposed between the sheets, but several hundred varves overlaid the upper sheet. In the summer of 1933 excavations were made near the diversion channel of the dam, and the writer observed 119 slightly contorted varves resting on 15 feet of till, which in turn lay on bed rock. Since the bottom varve is some 270 years older than the lowest varve on the upper till sheet, this clay must lie beneath the upper till. These observations confirm Antevs' conclusions and show that: (1) lake waters covered the dam site for 119 or more years after the first withdrawal of the ice; (2) readvancing ice overlay the site of the dam for 151 years and deposited the upper till sheet; and (3) some 270 years after the first retreat the ice finally withdrew and lacustrine conditions ensued for several hundred years.

The fauna of the White River Oligocene: W. B. SCOTT. Work on the great assemblage of mammals and reptiles which have been found in the Bad Lands of South Dakota, Nebraska and the adjoining states, must begin with Dr. Joseph Leidy's great monograph of 1869. Dr. Leidy was not himself a collector, but was dependent for his material upon the fossils sent him by others, especially by Dr. Hayden, who enjoyed the fortunate reputation among the Indians of being mad and therefore inviolable. Leidy's warning to paleontologists not to expect "novelties" for half a century to come has been rendered nugatory by the great advance in the art of collecting, an art which was developed by the men who worked for Professor Cope and Professor Marsh, above all by the late Messrs. Hatcher and Wortman, not to mention living men. In Leidy's time collecting consisted of picking up such fossils as had weathered out of the matrix and were lying on the surface, and erosion in those arid regions is very slow. Twenty or more museums have undertaken the work of collecting in the White River area, for in none of the American Tertiary formations is there such a wealth of beautifully preserved material; and in the list prepared for me by my colleague, Professor W. J. Sinclair, there are 94 genera and 339 species of mammals already named, to say nothing of the many tortoises and lizards. No doubt, the number of species must be largely reduced, but the genera will probably remain as numerous as at present.

The seeds of Supaia, a Permian Pteridosperm: DAVID WHITE. Several seeds apparently attached at the bases of as many pinnules of a fern-like plant, from the Permian Hermit shale in the Grand Canyon, Arizona, described by the author as a new genus, *Supaia,* could not be proved beyond question to be in organic union with the fronds on account of the gritty nature of the matrix and the complete absence of the plant substance, due to oxidation in the arid climate of the region and time. A fragment similarly oxidized, of *Supaia,* recently found in the Supai formation of the Apache Indian Reservation, Arizona, reveals the impressons of small cordiform platyspermic, winged seeds, completely agreeing with those from the Grand Canyon, each attached by a pedicel, about 4 millimeters long, to the rachis at the base of a pinnule. Not only is *Supaia* thus conclusively proved to belong to the Pteridosperms, of which it is the seventh form-genus in the Permo-Carboniferous to yield definitely correlated seeds, but it becomes most probable that the *Cyclocarpon*-like seed described as apparently attached pedicellately to a frond from the Grand Canyon tentatively referred to *Brongniartites,* a genus very close to *Supaia* and regarded as Pteridospermic, is in place of growth and a Pteridosperm.

(To be concluded)

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