SCIENTIFIC BOOKS

PROBOSCIDEA

A Monograph of the Discovery, Evolution, Migration and Extinction of the Mastodonts and Elephants of the World. By HENRY FAIRFIELD OSBORN. American Museum Press.

THIS is the first of two volumes to cover all the Proboscidea. The survey was begun in 1909 and completed in 1935 just before the death of Professor Osborn. During this quarter of a century the knowledge of the elephant family grew with such astonishing rapidity that what appeared at the beginning a relatively simple undertaking became a maze of phylogenetic lines. From this maze of incompletely distinguished material Osborn has sorted out 41 genera and hundreds of species, grouping them in their phylogenetic relationships to make a genetic tree of the elephants almost, if not entirely, as complete as that of the horses.

Osborn was impressed by the early and repeated tendency for the elephants to adapt themselves in varied directions, so that his genetic tree is highly polyphyletic. He divides the Proboscidea into four primary phyla, coming from an unknown, pre-Eocene, African ancestor. The first of these are the small amphibious Moeritheroidea, first appearing in the Eocene of Africa, and surviving only until the early Oligocene in Asia. The second group is that of the Deinotheroidea with no upper tusks and the lower tusks curved downward. They too appear first in the Eocene in Africa, but continue to live as large animals in Europe and Asia until the Pleistocene. The Mastodontoidae is the greatest group, with no less than 27 genera. These are lowland (swamp and savanna) animals, with tusks in the upper jaw and with all sorts of modifications of the lower jaw, living from the Eocene to after the ice age, though all extinct to-day. The fourth group is that of the Elephantoidea, grazing animals, which first appeared in the Pliocene and, though represented by a few living forms, reached their supremacy in the Pleistocene. It is to this last group that the second volume is to be devoted.

The greater part of this first volume is devoted to the Mastodontoidea, which are further subdivided into several phyla. The mastodonts begin with the African Palaeomastodon in the Eocene, migrate to Eurasia, where they diverge into Miomastodon and Pliomastodon, in Europe to Turicius especially, finally reaching North America, where they prospered and lived until after the retreat of the great ice sheet.

The long-jawed mastodonts (Longirostrinae) start in Africa with Phiomia in the Eocene at or near the base of the line. In Europe and Asia the group flourished, dividing into Trilophodon with three ridges on molars 1 and 2, and Tetralophodon with four ridges on these teeth. In the Miocene the group made its way to North America and has many representatives until rather late in the Pliocene. One side line in America is Amebelodon, which developed the "shovel-toothed" character, and which Osborn feels is directly connected to Phiomia.

The Serridentinae, with medium length lower jaws and blunt ridges on the molars, have no representatives until in the Miocene in Europe. From there it spread rapidly across Asia and into North America. Beside the typical genus Serridentinus, there are several specialized subphyla, first the "shovel tuskers" of the types of Serbelodon and Trobelodon in America; second, the extremely modified "shovel tuskers" with the "rod cones," Platybelodon; and third the Pliocene mastodonts of Florida, termed Ocalientinus.

The Rhynchorostrines, with their "beaked" lower jaws turned somewhat downward, have their first representatives in the Miocene of Egypt, followed by one in the Pliocene; then they blossomed out in America as typical Rhynchotherium. In Honduras two specialized genera are given the rank of genera, Blickotherium and Aybelodon.

The Brevirostrinae, or short-jawed mastodonts, began their history in the Miocene in Europe as Anacus, then migrated to Asia, where the genera Pentalophodon and Synconolophus are separated off on account of especially long and curved upper tusks. A group which separated off from Anacus reached North America relatively early as the Stegomastodon. Here they abounded through the Pliocene and well into the Pleistocene. One genus, Eubelodon, is separated off on account of the retention of the enamel on the tusks and this, as it migrated into South America, gave rise to Cuvierenius.

The group Notorostrinae are the other South American short-jawed mastodonts of the late Pliocene. Osborn postulates that they represent two separate lines, separate back to the Oligocene, though no earlier representatives have been found. One line is represented by Notiomastodon, the other by Cordillerion.

From the foregoing it is clear that Osborn demonstrated that the elephant family is highly polyphyletic, but to the writer it seems doubtful if there were ten separate phyla as early as the Eocene or nineteen in the Oligocene. However, the monograph represents one of the greatest forward steps of recent times, and could only be done by one with unusual facilities, and

especially unusual knowledge and patience. In this volume, and the one to come, every original description and figure has been reproduced; and the tangles, into which the various species were tied by fragmentary material and inadequate comparison, have been straightened out. This will be the starting point for all future students of the elephant family.

F. B. LOOMIS

ACADEMIES AND MEETINGS

THE TENNESSEE ACADEMY OF SCIENCE

THE 1936 fall meeting of the Tennessee Academy of Science was held at Vanderbilt University on November 27 and 28. Dr. C. R. Fountain, president, presided at the general session in Furman Hall; L. R. Hesler, chairman, at the botanical session in Buttrick Hall on Friday afternoon.

Schools represented on the program were: University of Tennessee, King College, Carson-Newman College, Teachers College, in East Tennessee; Vanderbilt University, University of the South, Teachers College, George Peabody College, in Middle Tennessee; the Southwestern, Teachers College, Freed-Hardeman, in West Tennessee. Botany and biology claimed more than half of the subjects, but physics, mathematics, archeology, geography, bacteriology, engineering, were also included.

Three members of the academy, in turn, discussed the rainbow trout, the wild trilliums of the Great Smoky National Park and the availability of the park as a field for biological research.

Dr. Clinton L. Baker made a report of investigations at the Reelfoot Lake Biological Station last summer by eleven selected workers under his direction as associate director and resident biologist for the Tennessee Academy of Science. The researches are soon to be published by the academy.

The procedure and results of a research of considerable importance made by E. W. Goodpasture and Katherine Anderson were given by Dr. E. W. Goodpasture, professor of pathology in the Vanderbilt Medical School, in a paper with illustrations entitled "The Problem of Infection as Presented by Bacterial Invasion of the Chorio-allantoic Membrane of Chick Embryos."

The American Association for the Advancement of Science research scholarship for 1936 was awarded by the executive committee to Dr. Horace B. Huddle, professor of chemistry in the State Teachers College, Johnson City, Tenn.

On Friday evening there was a dinner at the Andrew Jackson Hotel, which was followed by an address, "Radio Gives the Doctor a New Weapon—ultrasonic Waves," by Dr. C. R. Fountain, president of the academy and professor of physics at George Peabody College for Teachers.

Officers were elected for the ensuing year as follows:

President, Louis J. Bircher, Nashville.
Vice-President, Peyton N. Rhodes, Memphis.
Editor, Jesse M. Shaver, Nashville.
Secretary-Treasurer, John T. McGill, Nashville.
Director of Reelfoot Lake Biological Station, Clinton L. Baker, Memphis.
Librarian, Eleanor Eggleston, Nashville.

JOHN T. MCGILL,
Secretary

THE TEXAS ACADEMY OF SCIENCE

THE annual meeting of the Texas Academy was held in the Plaza Hotel, San Antonio, Texas, on November 12, 13 and 14. The annual dinner of officers and committees was held on Thursday night, during which time an informal discussion of the business of the academy was held. This was followed by the standing committee meetings.

The general program was divided into four sections, meeting in the various assembly rooms within the hotel. The Biology Section, with E. J. Lund as chairman, listened to a number of papers ranging in subject from the experimental work done with cotton to a synopsis of the monumental paper, "The Amphibia of Texas," by A. H. and A. M. Wright, Cornell University, N. Y.

The Geology Section had a full program, with subjects ranging from the "Pleistocene Man in Texas," by M. L. Crimmins, to the first of the papers on the geomorphology of the Rio Grande Delta, by W. Armstrong Price, A. E. Anderson and John Doering.

During the noon hour the sections held independent luncheons. Outstanding among these was the geology luncheon upon the invitation of the Petroleum Club, followed by a paper on "Heaving Shales and Evidences for Their Associations with High Rock Pressures in Oil Fields," by Paul Weaver.

In the afternoon the Chemistry, Mathematics, and Physics Section had a full program with two papers on mathematics and two on physics.

The Biology Section had a program that crowded the time. The outstanding papers were those by E. P. Cheatam, Southern Methodist University, relative to his studies on mollusca; the distribution of Texas Acridians, by E. B. Isely, Trinity University; and notes concerning the vegetation of the Woodbine Sands, Denton County, Texas, by H. L. Graham, Gainesville Junior College.