

quartzites, and a variety of volcanic rocks, comprising andesites, rhyolites, dacites and basalts. There were two periods of andesitic eruption. The arkoses and the older andesites which are among the most ancient rocks, are cut by large dikes of tonalite, which have altered the intruded rocks near the contact to quartz, biotite, garnet and staurolite schists. Strong, steeply dipping, jointing or sheeting is one of the latest geologic structures, and accepting the principal uplift of the range as late Pliocene, the jointing is probably not older. Along these joints most of the ore deposits have formed. The ores consist chiefly of arsenopyrite, chalcopyrite, pyrrhotite, pyrite, blende, galena and some less important sulphides. The deposits occur mainly in the tonalite and to a less extent in the older andesites, occasionally in the other rocks.

'The Mother Lode, folio, California,' by Mr. F. L. Ransome.

This special mining folio No. 63 of the Geologic Atlas of the United States was shown and its scope briefly outlined. It deals with an area six and a half miles wide and seventy miles long, embracing the greater portion of the so-called 'Mother Lode' system of gold-quartz veins.

'Paleobotanical Aspects of Some Upper Paleozoic Formations of Nova Scotia,' by Mr. David White.

A brief *résumé* of the correlations by stratigraphy on the one hand with the correlations by paleontology on the other hand. The Horton and the Riversdale plant beds, which are referred by the Nova Scotia geologists to the Hamilton, are, on the evidence of the fossil plants, referable to two stages; the Horton being Pocono and in the basal portion of the lawn Carboniferous, while the Riversdale plants indicate a stage for these at or near that of the Pottsville.

F. L. RANSOME,
DAVID WHITE,
Secretaries.

NEW YORK ACADEMY OF SCIENCES.

SECTION OF BIOLOGY.

THE regular monthly meeting November was held on the evening of November 12th, Professor C. L. Bristol, presiding.

The following program was offered:

F. C. Waite, 'The Bermuda Toad' (to be published in full in SCIENCE).

H. F. Osborn, 'The Phylogeny of the Rhinoceroses of Europe.'

H. L. Clark, 'Further Notes on Bermuda Echinoderms.'

Professor Osborn reported a continuation of his investigations upon the 'Phylogeny of the Rhinoceroses of Europe.' These animals appear to fall under the law of early divergence, and to constitute at least six separate series or phyla, which, so far as known at present, are not genetically related to each other, but undergo a more or less parallel development, as follows: Diceratheriinae, Aceratheriinae, Brachypodinae, Ceratorhinae, Atelodinae, Rhinocerotinae. The chief criteria in distinguishing rhinoceroses are the proportions of the skull, whether dolichocephalic or brachycephalic, the proportions of the limbs in reference to cursorial or aquatic habits, and the position of the horns; subsidiary to these features are the types of tooth structure. The origin of the Rhinoceroses is still obscure, although it appears to be possible to derive the Diceratheriinae from certain Eocene Hydracodontidae.

This study will be published in full in the *Bulletin* of the American Museum of Natural History, and it constitutes a part of the continuation of the author's memoir on the extinct Rhinoceroses.

Mr. H. L. Clark's paper was read by Professor C. L. Bristol. In this paper Mr. Clark gave an account of the Echinoderms collected by the party of zoologists from the New York University in the summer of 1899, together with a summary of his own observations during April of that year. It is to be concluded from an abundance of observations that the distinctions hitherto thought to exist between *Stichopus diabolii* and *acanthomela* are not to be regarded as valid, and the forms described under these names must be referred to *S. Möbii*. Twenty-nine species are listed.

Mr. Waite called attention to the fact that the madreporic body in *Asterias tenuispina* branches, forming 1-4 bodies in each animal, thereby making orientation difficult.

F. E. LLOYD, *Secretary.*