SOCIETIES AND ACADEMIES

NEW YORK ACADEMY OF SCIENCES. SECTION OF GEOLOGY AND MINERALOGY

THE section was called to order by the chairman, Professor J. Edmund Woodman, immediately on adjournment of the business meeting of the academy, at 8:20 P.M., March 3, 1913, at the usual meeting-place in the American Museum of Natural History. Some thirty-five members and visitors were present.

After calling President McMillan to the chair, Professor Woodman presented the subject of "The Interbedded Iron Ores of Nova Scotia." The field evidences were elaborately illustrated by lantern views and hand specimens—some half a hundred of each. The net results seemed to warrant a modified form of the replacement theory for the explanation of these deposits.

Professor Kemp commented on the interesting new evidence in the light of the older body of data which seems to argue somewhat in opposition to the findings of Professor Woodman, as presented by workers in other regions. He concluded with an invitation for remarks by Professor Van Ingen, of Princeton University, a former officer in the New York Academy of Sciences. Professor Van Ingen stated that the results of his investigations into the iron ore deposits of Newfoundland were as yet inhibitive, but that he had found extremely probable evidence of Paleozoic faunal connection between Newfoundland and certain European localities.

ON adjournment of the usual business meeting of the academy at 8:25 P.M., April 7, 1913, Chairman J. Edmund Woodman called to order the joint meeting of the Section of Geology and Mineralogy and the New York Microscopical Society in the regular meeting-place in the American Museum of Natural History. Sixty-six persons were present.

On a reading by Dr. E. O. Hovey, recording secretary of the New York Academy of Sciences, of the invitation extended the academy by the Twelfth International Geological Congress, which meets in August, 1913, at Toronto, Canada, the following delegates were nominated by the section: Professors J. J. Stevenson, J. Edmund Woodman, James F. Kemp and Charles P. Berkey.

The paper of the evening, on "The Genesis of Certain Paleozoic Interbedded Iron Ores," was presented by Mr. R. B. Earle. Some 50 lantern slides showing both microscopic and gross structures and textures were presented, several being projected by the splendid apparatus of the New York Microscopical Society. About 125 hand specimens were also exhibited. Mimeographic copies of a summary of the paper were available for all present.

Mr. Earle's work has been furthered by a grant made by the New York Academy of Sciences some months ago. He has visited many exposures along the Paleozoic bedded ore region of the Appalachians, and compared notes with many students of that problem, finding that ninety per cent. of them agree with Smyth's theory, as modified after James Hall, giving the ores a contemporaneous sedimentary origin.

Certain evidences underground seemed to Mr. Earle to discredit the theory of residual origin; inadequate source for the iron seemed to argue against that of replacement according to processes formerly suggested. While certain cavernous consolidations containing non-ferruginous sand and some granules coated with calcite argue for replacement, he finds evidence in the relatively impervious strata above and below the somewhat permeable iron formation for a different form of circulation of the iron-bearing solutions than previously appealed to, namely, artesian. He pointed out that not merely the Clinton horizon, but various other geologic epochs in the Appalachians carry iron formations of similar origin.

Professor Kemp congratulated the speaker on his excellent presentation, and suggested rather reasonable sources of iron from bicarbonates carried into estuaries, there deposited as hydrous oxides, later to be dehydrated. He inquired as to oxidation at such great depths by artesian waters, as to the sources of iron, and thought that stagnation rather than circulation would be probable under the conditions as presented.

Dr. George F. Kunz suggested that present conditions along saline shores, inland seas, and even in fresh-water bogs might be analogous to those during deposition of the Paleozoic ores, and cited the association of the Syracuse salts and Clinton ores, as well as the Swedish bog ores.

Professor J. J. Stevenson called attention to certain fragments of the ores in the superjacent sediments, and to certain points bearing on leaching from sediments above. He thinks the whole truth is not told by the new theory.

The lateness of the hour precluded further discussion at this meeting, so that on motion of Professor Berkey additional time for consideration of the paper was granted place on the program of the next monthly meeting.

Dr. Hovey read by title a paper by Mr. Warren

M. Foote on "Factors in the Exchange Value of Meteorites."

THE section was called to order at the usual meeting-place in the American Museum of Natural History by the chairman, Professor J. Edmund Woodman, at 8:25 P.M., May 5, 1913. Thirty-five persons were present.

Following the acceptance of the resignation of Charles T. Kirk, secretary of the section, Dr. A. B. Picini was recommended to the council of the academy for election to that office.

The following papers were read by title:

"A Contribution to the Geology of the Wasatch Mountains, Utah," by Mr. Ferdinand F. Hintze, Jr.

"Physiographic Studies in the Allegheny Plateau, Particularly along its Western Margin in Ohio and Kentucky," by Dr. Jesse E. Hyde.

"A Limestone Dike in Southern Ohio," by Dr. Jesse E. Hyde.

Then was continued the discussion of Mr. R. B. Earle's paper on "The Genesis of Certain Paleozoic Interbedded Iron Ores," presented at the April meeting.

Professor Kemp was invited to open the discussion, and inquired: (1) If there are not other oolites than the Clinton horizon which have been replaced by iron? (2) Would there not be stagnation of the water below the vadose region?

Mr. Earle referred number (1) to his colleagues, and replied to number (2) by saying that the "impervious" beds are not wholly so, but only more so than their contained loosely aggregated beds—the iron formations. He believes, moreover, that there have been fluctuations of the ground water level. He observed also, in reply to Professor Stevenson's inquiry at the last meeting, that the fragments in the superjacent beds are not directly in contact with the iron formation, and cited replacement of pebbles and not of their matrix, a feature also described in U. S. Geol. Survey Bull. 430.

Professor Woodman, in comparing with the iron ores of Nova Scotia, showed that various materials are replaced, and that there are isolated granules of iron ore contained in a matrix of mud, an observation similar to those of Mr. Earle. Professor Woodman maintains that the cavernous consolidations are unexplained by any syngenetic theory; also that there is either partial replacement or partial leaching in various regions. He finds, incidentally, that the materials typically replaced are siliceous rather than calcareous.

Professor Grabau discussed the iron ore deposits of Tennessee, stating that they are replaced fossils which have not been rolled. He observed that the deposits in Wisconsin have pebbles with surfaces resembling desert varnish, and that the pebbles lie at all attitudes. There are no fossils; the beds are lens-shaped—apparently cross-bedded by wind action. There is little cementing silica. He believes that the original sediments in these instances have been replaced by iron.

Dr. A. B. Picini followed with observations on the chemistry of iron ore deposition, showing that there is yet too little known of such processes in nature to prophesy certainly as to oxidizing or deoxidizing conditions underground. He referred to Van Bemmelen's results, which show that the yellow oxides of iron deposited chemically are non-colloidal, while the red are colloidal.

Mr. A. P. Picini gave account of experiments still under way in which he has already secured some replacement in a few hours by passing iron in carbon dioxide solution through porous calcite and silica at about 10 atmospheres.

Professor A. W. Grabau's paper on "Irrational Stratigraphy: The Right and Wrong Way of Reconstructing Ancient Continents and Seas" was of the nature of a critique. It was illustrated with paleographic maps by Schuchert, Ulrich, Willis, and Chamberlin and Salisbury. The thesis indicated that these maps are too often based on paleontology alone to the neglect of the sediments themselves—especially their origin. There are sometimes arms of the sea across areas where the origin of a bed of conglomerate would be expected. Erosion was here left out of the question, and a "stratigraphic hash" was the result. Further, basins where crinoids, corals, brachiopods, etc., are found are mapped too small.

Questions followed by Professor Woodman on the probable width of Appalachia, by Dr. C. A. Reeds on the connection between the Atlantic and Pacific in Silurian time, on the origin of the Silurian salts, and on the position of the present Atlantic deep where once Appalachia, a considerable continent, is supposed to have lain.

Professor Grabau thinks Appalachia may partly have lain where the Atlantic coastal plain now is, and did not extend over to the present Atlantic deep; that is, was perhaps less than 500 miles wide. The Silurian salts he thinks have originated while the Taconic land mass lay to the eastward in such a position as to cut off moisture-bearing winds.

CHARLES T. KIRK,
Secretary of Section