subjects can not be summarily dismissed. Many observations would certainly warrant a negative answer to the last two questions, while some would not. Not only do we need more pertinent and reliable observations, but a more exact analysis, as well as more certain criteria.

A chipping sparrow will pluck a horse hair from the mouth of a nestling, while another bird like an oriole will stand by and see its mate hung until dead without attempting to release it. A robin will tug at a string which has caught on a limb, but is never seen to fully meet the situation by releasing the string. It will make several turns of a cord about a limb and leave the other end to hang free without any relation to the nest, so that its effort is useless. It ties no knots. The gull, according to abundant and competent testimony, will carry shellfish to a considerable height, drop them on the rocks or hard ground, and repeat the experiment until it gets the soft meat. This suggests adaptive intelligence or even analogical reasoning, but probably does not rise above the level of associative memory. The habit is probably casually formed, and is certainly rare.

Francis H. Herrick
Biological Laboratory,
Western Reserve University

## SCIENTIFIC BOOKS

*Early Devonic History of Northeastern North America.* Memoir 9, New York State Museum, New York State Education Department, 366 pp., 48 plates, sections, diagrams, maps, etc. Albany, 1908. By J. M. Clarke, State Geologist, and Director of the New York State Museum.

In this magnificent memoir, with its princely plates and exquisite illustrations, the state of New York has once more shown the world how far science and art had reached towards a realization of satisfactory results in describing and illustrating the hard facts of geology in an orderly and delightful manner.

To the student of paleontology and stratigraphical geology this handsome contribution to the history of early Devonian times will be most welcome. It fills a long-felt want, and serves to tie together a number of faunas and formations with others in the State of New York as well as beyond. Science, and geology especially, knows no political boundaries. As Dr. Clarke very aptly puts it, "The New York series of formations spreads away from its typical region to all points of the compass, and in all these directions, however far it extends, light is to be sought for the explication of past geologic conditions in New York." "The state, . . . does not and never can in itself afford the solution of its own problems." Professor James Hall for the sixty-three years that he was in office at Albany had shown that the New York series extended beyond the limits of New York State. The standards laid down by the fathers of geology in northeastern America, like Hall, Logan, Dana, Billings, Emmons and many others, were to be kept high and to the fore.

The subject-matter dealt with by the distinguished successor to James Hall in the memoir before me was obtained by Dr. Clarke in the Peninsula of Gaspé, in southeastern Quebec. After describing the general distribution of the "Early Devonic of New York" and pointing out their extension north and east, he then sets to the task of giving the geology of the region covered by the memoir. The geology of the Forillon, of Percé (a brief sketch of which had appeared in 1903 in advance sheets from the report of the paleontologist, 1904, and in Bulletin 107, Geological Papers, Albany, 1907) the Gaspé sandstones, etc., is followed by descriptions of the various faunas.

*Three* distinct faunas are noticed, and their rich harvest of forms new to science, or recorded afresh, constitute the bulk of the material on which the memoir is based. They are as follows:

I. Fauna of the St. Alban beds. Forty-eight species.

II. Fauna of the Cape Bon Ami beds. Of this fauna eleven species are recorded.

III. Fauna of the Grande Grève limestones. One hundred and sixty species.

Observations on the Dalmanites of the early Devonian are introduced in the text which throw light upon race characteristics, debility as exemplified in ornamentation of different parts of the organism. *Gaspelichas forillonia,* a new species, is indeed "the most extravagant instance of the development of spines among the trilobites."

This monumental work by Dr. Clarke only serves to enhance his deserved fame as a distinguished paleozoic paleontologist. The plates are all that can be desired, the text likewise is satisfactory, as to both quality and precision. References are made to the good work done in the peninsula by Logan, Billings, Ells, Low and others whom the author does not forget in bestowing names on the new forms met with. Nor does he forget those intrepid missionaries and early French explorers like Lejeune, Jumeau, Lescarbot, Leclercq and de Thune, and the Jerseymen and other settlers of the district who have in any measure contributed to the history and development of Gaspé.

The geology of the "Forillon" with map, is given in which the Gaspé sandstones, the Grande Grève limestones, the Cape Bon Ami beds and the St. Alban beds are separated on paleontological and stratigraphical grounds. This remarkable point juts out into the Gulf of St. Lawrence "like an index finger," from the broad fist of Rosier Cape and Cove, and two of the four geological formations constitute the narrower portion of the slender point, with Cape Gaspé to the north and Shiphead to the south. The vertical distribution of species and the faunas of the different formations and their mode of occurrence are given, together with a special chapter on the "Geology of Percé" in which a geological map in detail is presented giving the succession of the strata, including formations from the Carboniferous down to the Lower Silurian. They comprise the Bonaventure conglomerate (Carboniferous and Devonian in age), the "Percé massive" (Lower Devonian), the Cap Barré massive (Lowest Devonian), Mt. Joli massive, north flank (Upper Silurian), Mt. Joli massive, south flank (Lower Silurian), Cape Canon massive, including limekiln beds (Lower Silurian). The faults noted by Dr. Clarke appear to be of the same character as those of the "Quebec Group" and "Appalachian" folded region, a series of thrust faults, very much like those movements so characteristically described by Lugeon of Switzerland, where strata seem to play leap-frog one over the other. The reproduction of a number of old historic maps and early illustrations of this most interesting and picturesque as well as easily reached region forms no inconspicuous portion of the volume, nor can the delightful water-color reproduction of Percé rock forming the frontispiece go unnoticed. The excellent drawings by Barkentin illustrating the extinct faunas are exquisitely reproduced.

H. M. AMI

GEOLOGICAL SURVEY OF CANADA,
OTTAWA, ONT.

## SOCIETIES AND ACADEMIES

### THE MICHIGAN ACADEMY OF SCIENCE

THE academy held its fourteenth annual meeting at Ann Arbor, Mich., April 2, 3 and 4.

The following officers were elected for the coming year:

*President*—Charles E. Marshall, East Lansing, Mich.

*Vice-Presidents:*

*Section of Agriculture*—A. C. Anderson, East Lansing, Mich.

*Section of Botany*—Wm. E. Praeger, Kalamazoo, Mich.

*Section of Geography and Geology*—Wm. H. Hobbs, Ann Arbor, Mich.

*Section of Sanitary Science*—E. C. L. Miller, Detroit, Mich.

*Section of Science Teaching*—S. D. Magers, Ypsilanti, Mich.

*Section of Zoology*—D. B. Casteel, Ann Arbor, Mich.

*Secretary-Treasurer*—Walter G. Sackett, East Lansing, Mich.

*Librarian*—G. P. Burns, Ann Arbor, Mich.

On the evening of April 3 the members of the academy were very pleasantly entertained at a smoker given by the Research Club of the University of Michigan.