power of the waterfall, have worn the river bed to a maximum depth of nearly 200 feet beneath the water surface.

The narrowness of the gorge along the Whirlpool rapids is therefore attributed to the conditions of the river erosion here indicated, rather than to decrease of the volume of the river by diversion of the water of the upper lakes to flow from Lake Huron eastward. Studies of the glacial Lake Agassiz convince the author that the progress of the epeirogenic uplift of the northern United States and Canada from the Champlain depression was too rapid to accord with the hypothesis of any outflow from Lake Huron toward the east during the long time that would be required for the Niagara River, while thus diminished, to erode the gorge along the Whirlpool rapids. The explanation here given accords mainly with Dr. Julius Pohlman's discussion of the Niagara history, but differs concerning the age of the river and of postglacial time, which is estimated, as from Professor N. H. Winchell's discussion of the Falls of St. Anthony, to have been between 5,000 and 10,000 years.

The Princeton Expedition to Patagonia. W. B. SCOTT.

Professor Scott gave an outline of the remarkably rich finds made by the Princeton expedition, whose gatherings already amount to 20 tons and include 1,000 skulls. Mr. Hatcher is again on the ground and will remain three years. The results at present reached show that much revision is necessary of the Argentine stratigraphy as at present published. The lowest beds examined, constituting the Patagonian a marine formation, are Oligocene or lowest Miocene and are equivalent to the Miocene of New Zealand. The overlying Santa Cruz beds of volcanic ash, possibly lacustrine, are not older than the middle Miocene. The upper series or Cape Fairweather beds are Pliocene. All the fossils are in great contrast with those of North America, and the investigator finds himself in a new world. They show foreshadowings of the present South American types. Notwithstanding the incomplete stage of the investigation, many details were given by the speaker which were of the greatest interest to the Society.

The following papers were read by title:

Location and Form of a Drumlin at Barre Falls, Mass. WILLIAM H. NILES.

Drift Phenomena of the Puget Sound Basin. BAILEY WILLIS.

Notes on the Geology of the Rocky Mountains of Montana. WALTER H. WEED.

Weathering of Alnoite in Manheim, N. Y. C. H. SMYTH, JR.

On the Occurrence of Corundum in North Hastings, Ont. A. E. BARLOW.

The regular business of the meeting being concluded, the Society passed resolutions of thanks for the extremely hospitable reception that it had received from the resident Fellows, especially Professors Adams and Porter, and from the authorities of McGill, and then adjourned. In the evening the usual banquet was held in the Windsor Hotel and proved a very enjoyable conclusion of the exercises of the week.

All the visitors were greatly impressed by the new buildings and fine laboratories of McGill, and repeatedly expressed their appreciation and admiration for the gifts of Mr. McDonald, who has been largely responsible for the recent expansion. The advance of one university is a stimulus and an encouragement for all.

J. F. KEMP.

COLUMBIA UNIVERSITY.

IOWA ACADEMY OF SCIENCES.

THE twelfth annual session of the Iowa Academy of Sciences was held on December 27 and 28, 1897, with Professor T. H.

Macbride, of the State University, presiding. A goodly number of scientific workers of Iowa and adjoining States were present, among them Professor J. E. Todd, State Geologist of South Dakota; Mr. Frank Leverett, of the United States Geological Survey; Charles R. Keyes, former Assistant State Geologist of Iowa and later State Geologist of Missouri; Professor F. W. Sardeson, of the State University of Minnesota; Professors Calvin and Shimek, of the State University; Professors Weems, Osborn and Ball, of the State College at Ames; Professors Page, Arey, Newton and Mortland, of the State Normal School, Cedar Falls; Mr. R. I. Cratty, of Armstrong; Professor T. M. Blakeslee, of Des Moines College; J. L. Tilton, Indianola; L. S. Ross, Des Moines; W. S. Hendrixson, Grinnell, and others.

'Some Geometrical Generalizations,' by T. M. Blakeslee, was a discussion of a method whereby a number of geometrical theories could be put under one, itself a special case of a more general proposition, and hence more easily proven.

In the absence of Professors Combs and Pammel, papers on 'Comparative Histology of Corn Leaves' and 'Comparative Anatomy of the Fruit of Corn' were presented in summary by Professor C. R. Ball. The study was undertaken to determine, if possible, variations of structure that could be used in selection of varieties specially adapted to Iowa climate.

'Occurrence of *Termes flavipes* in Iowa,' by Herbert Osborn, noted the observation of the white ant, so common in Southern States, at LeClaire.

In a paper by Professor C. C. Nutting, 'Do the Lower Animals Reason?' the ground was taken that this faculty exists among lower members of the animal kingdom. In the discussion following the reading a number of instances supporting the views advanced in the paper were cited by different members.

Professor Herbert Osborn, in a paper, 'Additions to the List of Iowa Hemiptera,' enumerated ninety-seven species that had been hitherto unrecorded. Some of them were new to science, and two species that present striking mimicry and dimorphism were described in detail.

The same author, in 'Coccidæ Occuring in Iowa,' discussed the species of scale insects observed in the State, giving characteristics by which they might be recognized and calling special attention to the probability of introduction of the San José Scale, the means by which it is distributed, and the necessity for prompt recognition should it appear.

'The Hemipterous Fauna of Northwestern Iowa,' by the same author, presented results of a collecting trip in the northwestern counties and showing the occurrence in this area of species which belong properly to the plains of Nebraska and the Dakotas; also, some forms that occur normally in more southern localities, but seem to follow up the Missouri river; still others that are boreal in distribution, but that occur in the northwestern corner, and, so far as known, only in that part of Iowa.

The President's address, by Professor T. H. Macbride, of the State University, began with an interesting review of scientific work of the year past. Especial mention was made of the contributions by Iowa scientific workers, members of the Academy. This was followed by a prophetic outlook on the work that lies before Iowa scientific workers, the speaker giving unqualified commendation to those researches which result in practical value to mankind.

Professor B. Shimek read a paper on the 'Flora of the Sioux Quartzite in Iowa.' The researches presented, which form a continuation of those prosecuted in former years, resulted in the addition of a number of species. A comparison was drawn between conditions existing in June and

August, and the meeting of Eastern and Western flora in this region were discussed.

Professor T. H. Macbride read a paper on 'The Myxomycetes of the Black Hills.' These minute and interesting organisms which thrive in moist climates exist here under conditions that would seem very unfavorable. They are, however, much dwarfed as compared with those occurring in most localities in eastern Iowa, and, while affording an abundant variety, are such as would be recognized anywhere as very peculiar and poor.

'Idiocerus and Pediopsis,' by Herbert Osborn and E. D. Ball, included a discussion of generic affinities and species occurring in North America. Some of the species are abundant on various trees and of economic importance.

Papers by Professor Fitzpatrick on 'The Flora of Northeastern Iowa' and 'The Flora of Southern Iowa' were read by title.

What proved to be a very spirited discussion on the formation of the loess of the western part of the State and other portions of Iowa was opened by the paper of Professor B. Shimek on 'Is the Loess of Aqueous Origin?' followed by one on 'The Degradation of the Loess,' by Professor J. E. Todd, State Geologist of South Dakota. Professor Shimek presented a vast array of evidence, mainly from the occurrence and distribution of the mollusca, to support his view that parts at least of this formation could not have been deposited in water. The facts presented had been gathered with the greatest care, and the evidence most thoroughly sifted so that the conclusions must command wide attention.

Professor Todd presented numerous cases where the loess material gave evidence of creeping and ravining, and the formation of secondary deposits in which the determination of fossils became difficult.

Dr. C. R. Keyes presented a paper on 'The Carboniferous Formation of the Ozark Region,' embracing results of recent work and a statement of equivalent formations for different parts of the area.

Professor Calvin, in a paper on 'Some Anomalous Valleys and Paradoxical Divides in Delaware County, Iowa,' called attention to the peculiar habit, noted in the eastern part of the State, of streams turning aside from low plains to follow chasms cut in highlands that rise from forty to fifty feet above the plains from which the stream turned aside.

One of the most interesting features was a symposium on interglacial formations in Iowa, and participated in by Messrs. Calvin, Leverett, Bain, Udden and Fitzpatrick.

Professor Calvin opened with a discussion of the 'Interglacial Deposits of Northeastern Iowa,' describing the forest beds and gravel formations and discussing the significance of the gravels and the availability of the term Buchanan as a name for an interglacial stage.

In papers on 'The Weathered Zone (Sangamon) between the Iowan Loess and the Illinoisan Till Sheet' and 'The Weathered Zone (Yarmouth) between the Illinoisan and Kansan Till Sheets,' Mr. Leverett discussed the characteristics of the deposits and proposed names for each soil horizon. Mr. Bain considered 'The Aftonian Deposits of Southwestern Iowa,' locating typical exposures and presenting evidence to show that in southwestern Iowa there are cases of a drift sheet of unknown extent earlier than the Kansan and separated from it by an interval of unknown but considerable length. It is believed to represent one of the theoretical earlier and minor advances of the ice.

The paper by J. A. Udden, on 'Preglacial Peat Beds,' was a consideration of the peat beds and soils under all the drift and upon the rock surface.

Professor T. J. Fitzpatrick discussed 'The

Drift Section and Glacial Striæ in the Vicinity of Lamoni.'

The facts brought together in this symposium serve to clear up a number of debated questions relating to the glacial and interglacial deposits in Iowa, and must serve as a most substantial basis for any further studies of this interesting and important subject.

The following papers read by title were referred to the Secretary for publication in the Proceedings:

L. H. Pammel, J. R. Bumip and Hanna Thomas, 'Comparative Study of Berberidaceæ.'

L. H. Pammel, 'Notes on Fungi in Iowa for 1896–7.'

G. W. Carver, 'Notes on Fungi in Iowa for 1895–6.'

This meeting of the Academy was one of the best attended and most interesting in its history.

Its next annual meeting will be held in December, 1898.

The following officers were elected for the ensuing year: President, Professor T. H. Macbride, Iowa City; First Vice-President, Professor B. Fink, Fayette; Second Vice-President, Professor M. F. Arey, Cedar Falls; Secretary-Treasurer, Herbert Osborn, Ames; elective members of Executive Committee, Professors S. W. Beyer, Ames; A. C. Page, Cedar Falls; and W. H. Norton, Mt. Vernon.

HERBERT OSBORN.
Secretary.

CURRENT NOTES ON ANTHROPOLOGY.

THE PRE-MYCENÆAN CULTURE.

A SCORE of years ago the early history of Greece was bounded by a Homeric fog, a thousand years or so B. C. Then came the brilliant researches of Schliemann at Hissarlik, Tiryns and Mycenæ, and the fog lifted to reveal the vivid and potent Mycenæan culture at its acme, about 1500 B. C. Now, once more, the clouds have rolled away, and investigations on the islands of the Archipelago and the mainland of Greece have disclosed to us, with abundant clearness, the 'pre-Mycenæan' culture, extending from about 2000 to 3000 B. C.

It is simple and rude, that of the Grecian folk before they had been touched by the Promethean fire which transformed them to the noblest artists of all time. The statues of stone are misshapen and incomplete; the pottery is generally coarse, and it is doubtful if its moulders knew the potter's wheel; its decoration is in lines and spirals only, animal figures being unknown; neither the sword nor gold had yet been discovered; tattooing was common; and the general condition was that of barbarism.

A full, well illustrated and instructive article on this culture is that of C. Blinkenberg, in the Memoires de la Société Royale des Antiquaires du Nord, 1896.

CONTRIBUTIONS TO THE STUDY OF THE STONE AGE.

PROFESSOR ENRICO H. GIGLIOLI, of Florence, has recently published a number of interesting papers bearing on the industries of the stone age in various parts of the world.

In one he describes, from an unpublished MS., the stone age in New Caledonia as it now exists. It is in the neolithic stage, but the period is not far distant when it emerged from paleolithic types. Another article describes various stone implements still in use among the tribes of the Rio Napo, in South America. They are principally axes of various sizes and forms. Again, from Melaneria, he figures and describes the formidable maces of the natives of New Britain, made of hard wood, the end armed with a perforated stone, spheroidal in shape. Finally, in a note with several illustrations, he explains the use of the stone-armed threshing machine still a common implement in Tunisia. These and