both interesting and informing in an unusual degree.

Francis H. Herrick

SOCIETIES AND ACADEMIES

ORGANIZATION MEETING OF ILLINOIS STATE ACADEMY OF SCIENCE

More than one hundred persons gathered in the senate chamber at Springfield at ten o'clock Saturday morning, December 7, for the purpose of organizing a state academy. The meeting was called to order by A. R. Crook, curator of the State Museum, and U. S. Grant, Northwestern University, was elected chairman.

The opening address by Professor Chamberlin, on "The Advantages of a State Academy of Science" was given in the extemporaneous form and the following outline very imperfectly represents what was said.

Professor Chamberlin introduced his address by conveying the felicitations of the Chicago Academy of Sciences, and sketched some of the salient features of its history of a little more than fifty years, as a means of giving concrete illustration to some of the problems which the new academy must face. Special attention was directed to the radical change in the nature and relations of scientific activity since the oldest academies of the interior were established. In the pioneer days, an almost virgin field was open to naturalists, and enthusiasts in this field constituted the largest factor in the membership of its academies of science during their early stages of development. The results of these pioneer workers were much more fully within the appreciation of all their colleagues and of the intelligent public than are the products of the more highly specialized investigations of to-day. So widely has research deployed in the last fifty years, and so far has it reached into the more recondite phases of each field, that there is now far less community of interest and of intelligent appreciation, even among scientific workers themselves. This fundamental change brings new problems of organization and of adjustment. In like manner, the function of an academy as an avenue of publication has assumed a new aspect. Fifty years ago, an appropriate means of publication was one of the greatest needs which the academies supplied to the pioneer workers, for, aside from these academies, the available opportunities of giving publicity and permanence to scientific results were few and unsatisfactory. As the regional element was dominant in the results of the early naturalists, it was fitting that there should be a local means of publication. To-day, however, the results of research are, in general, more serviceable to scientific workers if they are gathered into the special journals devoted to the several departments of science. While the function of publishing the results of regional investigations still remains and may well continue to be subserved by the regional academies of science, and while certain adaptations of other results may serve an important regional purpose, the question whether an academy should endeavor to be the avenue of miscellaneous publication to the same extent as in the early days is one of the problems that invite the serious consideration of a new academy.

Attention was also directed to the problems presented by the geographic distribution of the centers of scientific activity within the state and by the not altogether felicitous relations of these centers to the capitol of Illinois.

The advantages of a state academy to those who are just entering upon scientific careers, to amateurs dissociated from institutions of research, to trained workers in relative isolation, and to workers in scientific centers, were specifically set forth. The values to be derived from opportunities of reading papers before fellow workers, of submitting results to discussion, of participating in the discussion of others' results, of extending scientific acquaintance, of cooperation, of mutual stimulus to endeavor, of personal education by contact with other workers, were dwelt upon in detail. The value of the academy as a means of disseminating the spirit, the method, and the love of science among the people of the state was especially emphasized. The func-

tion of advising relative to legislation on scientific matters was urged as highly important.

The address was closed by an earnest advocacy of the value of the spirit and method of science to the state and nation as an essential element in the solution of its great social, political, and ethical problems. The habit of conscientious search for the precise truth and the systematic control and guidance of opinion and action in accordance with the canons of scientific procedure were urged as means of supreme value in the elevation and purification of the common thought and feeling of our people. More than perhaps anything else, are the intellectual and moral methods of science a protection against current evils and a guarantee of safety in the future.

S. A. Forbes, University of Illinois, gave a history of the formation and existence of former state natural history societies. He called attention to the small number of scientific men in the state at the time when such organizations had their existence; pointed out the difference in present conditions; and showed the promise which there is of an important present and glowing future for the state organization. His address has been printed in SCIENCE.

The chair appointed as committee on organization: S. W. Williston, University of Chicago, Wm. A. Noyes, University of Illinois, and C. B. Atwell, Northwestern University. And these three selected to complete the committee of nine called for: T. C. Chamberlin, University of Chicago, S. A. Forbes, University of Illinois, A. R. Crook, State Museum, Fred L. Charles, State Normal School, H. V. Neal, Knox College, and B. B. James, James Millikin University.

At 2 P.M. the committee on organization reported with a constitution. The report was considered item by item and the constitution was adopted. The following officers were elected:

President—Professor T. C. Chamberlin, LL.D., University of Chicago.

Vice-President—Professor Henry Crew, Ph.D., Northwestern University.

Secretary—A. R. Crook, Ph.D., curator State Museum.

Treasurer—Professor J. C. Hessler, Ph.D., James Millikin University.

Dr. H. Foster Bain, state geologist, was appointed a member of publication committee.

The committee on membership consists of: Professor S. A. Forbes, LL.D., University of Illinois, Professor T. W. Galloway, James Millikin University, Professor J. P. Magnusson, Ph.D., Augustana College, Dr. C. H. Smith, Hyde Park High School, Chicago, and Professor B. B. James, James Millikin University.

After the organization was completed ten-minute addresses were given in a symposium on the outlook for young men in science. All of the speakers took an optimistic view of the situation.

W J McGee, as a guest of the occasion, represented the outlook in anthropology. The recognition and financial rewards to the worker in this branch are probably less than in many other branches of science, but the amount of work which remains to build the science into goodly proportions is great.

Dr. Coulter called attention to the many fields which are open to the worker in botany. Rewards are promised to the original worker, to the teacher and to men who would be satisfied with the less attractive, but none the less useful, work of cataloguing the flora of various regions.

Dr. Noyes finds the outlook for workers in chemistry not only attractive scientifically, but financially as well.

Dr. Bain considers the work of investigation and of practical application of geology to be in the main very alluring.

Dr. Crew pointed out the vast amount of investigational work which lies before the physicist, although any one who enters the door of pure physics will find written before the entrance "Leave behind the hope of wealth! All ye who enter here."

Dr. Neal read letters from various leaders in the teaching of zoology in many institutions, showing that the call for workers and investigators in zoology is great, and concluded that zoology offers a most attractive field for

men whose ambition is not wealth but a competence.

An informal dinner was enjoyed at six o'clock by about seventy-five persons.

In the evening to an audience of about six hundred, Dr. W J McGee gave his lecture on "Greater Steps in Human Progress."

His address combined in a rare degree such facts as would attract men of the highest scientific attainments and at the same time the more popular audience also. It might be expected that such a title, "Greater Steps in Human Progress," would imply consideration of the remarkable manufacturing and commercial advances which have characterized the last century.

His plan, however, was to note various habits and discoveries of men which indicate evolution from a low physical and mental equipment to the full expansion of man's faculties. Primitive men were unable to open the palm of the hand so as to bring the thumb in the same plane with the fingers. This was shown by the aboriginal Philippine tribes which Dr. McGee assembled at the St. Louis Exposition.

Primitive man is characterized by movements of the hand and arm *toward* the body, whereas his more highly developed descendant directs these movements *from* the body. It is the Anglo-Saxon who has shown this development in the highest degree, and while in other respects prize fighting is indicative of the lower traits, in this one fact, namely, that the motions of the arm in a well-directed blow are from the body of the fighter, the prize fighter's profession indicates high physical development—a real step in progress.

The savage grasps a knife with the blade held towards the body. Civilized man holds the blade from the body. The mistress wishing to judge the mental alertness of a prospective maid servant should hand her a plate and towel noting the motion of the hand as the maid wipes the plate. If the motion of the right hand is clock wise the maid should be considered a promising subject.

At some length Dr. McGee illustrated the fact that the development of "knife sense" is one of the greatest steps in human progress. Primitive men used a rounded stone and had no conception of the value of a sharp edge.

Another one of the great steps, and indeed the chief one, is in the use of fire. Man alone of all created things employs fire. It required long ages for men to learn the use of fire, and this discovery has made possible the great development of the human race, socially, commercially and intellectually.

Finally the faculty of invention is one which has contributed most forcibly and characterized most materially the development of the human race.

The interest which was displayed throughout the meeting, argues well for a successful and useful career for the society.

A. R. Crook,
Secretary

The Geological Society of Washington

The 195th meeting of the society was held on November 20, 1907, Vice-president Campbell in the chair and thirty-one members present.

Regular Program

The following papers were presented:

Report on the Geological Work of the Third Petroleum Congress: David T. Day.

The congress was called for September 8, in the city of Bucharest, Roumania, but the preceding days were also occupied in a geological excursion through the principal oil field—that of the Prahova Valley.

By means of a preparatory lecture by Professor L. Mrazek, director of the Geological Survey of Roumania, and by his continued guidance on the trip, a particularly good view was obtained of the complicated folding characteristic of the south flank of the Transylvanian Alps, where many well-marked anticlinals are evident, and along the axes of which the oil is chiefly sought (and found). The principal accumulations are closely associated with overthrust faults.

The congress visited principally the Bushtenari field, and had a good view of the geologic structure in passing from Bushtenari to Campina and to Moreni. In the latter field,

drilling is made particularly uncertain by a large body of rock salt which takes part in an over-thrust fault, the oil being found close to the under side of the salt. The oil is usually found under great pressure, and gushers are quite common. The oil is usually black, rather ethereal in its odor, and contains both paraffine and asphalt. In many cases, by natural diffusion the asphalt has been lost. The oil is then light in color, and in specific gravity. The oil carries a considerable proportion of members of the benzol series, which, of course, adds to the difficulty of refining.

The scientific work of the congress was divided into three sections—the first section being devoted to geology and oil exploration. Thirty-nine papers were presented in this section, of which twelve were descriptions of petroleum deposits, ten on theories of origin, ten on methods of drilling, and the remainder relating to oil-well management. H. Foster Bain, Ralph Arnold and A. F. Lucas contributed papers in regard to the Illinois, Santa Maria, California and Texas fields, respectively. Much attention was given to the discussion of structural details in the Roumanian fields.

A most important result was pointing out the evident importance of water in filling up the pores of the rock which form covers to the oil pools, and thus prevent the oil from escaping.

Mrazek's insistence on the function of water in driving by capillary action the oils from a diffused condition in shales, and compressing them in relatively small sands, was also of much importance for oil geology.

In regard to theories of origin, Professor Carl Engler replied to the criticisms which have been made against his theory on the animal origin of oil on account of the difference in optical activity between his oil prepared from fish, and natural oils, by showing that destructive distillation of cholesterine gives products similarly optically active to crude petroleum.

The Association of Alunite with Gold at Goldfield, Nevada: F. L. RANSOME.

The alternation of the andesitic and rhyolitic rocks of Goldfield which stands in closest relation to ore deposition has resulted in the removal of nearly all of their lime and magnesia, three fourths of their soda and two thirds of their potash. On the other hand water and sulphuric acid have been added and the iron of the original silicates has been converted to pyrite. The introduction of sulphuric acid is shown in the extensive development of alunite and some kaolinite and diaspore at the expense of the original feldspars.

The solutions which deposited the ores were acid and probably hot. They carried gold, copper, bismuth, antimony, a little arsenic, selenium and tellurium, hydrogen, sulphide, and probably sulphurous and sulphuric acids. Their solvent action on quartz was feeble.

The recognition of alunite as a characteristic constituent of the Goldfield ores and the demonstration of its genetic relation to them establishes a new type—that of alunitic and kaolinitic gold-quartz veins, in the classification of epigenetic deposits based upon the kind of metasomatism effected in the wall rock by the ore-depositing solutions. It is not believed that the Goldfield District is unique in the possession of this type. Other examples are likely to be found among the great number of ore deposits associated with Tertiary volcanism. The constituents removed from the Goldfield rocks are those which are deposited extensively in the production of gold-quartz veins of the sericitic and calcitic type. Consequently conditions are conceivable under which the acid solutions of Goldfield might have ascended through a much thicker series of rocks and given rise to sericitic and calcitic veins.

Finally, the relation of the alunite and kaolinite at Goldfield suggests the possibility of the future discovery of metasomatic veins of the pure alunitic type, without kaolinite.

The Place of the Great Raised Beaches in Geology: H. W. PEARSON.

Mr. Pearson gave the results he had reached in a study of the great raised beaches of Europe and America. Attention was called to the fact that up to the present time too little consideration had been given by geologists to

these terraces, which Mr. Pearson believed to be of marine origin. It was shown that if the elevations of beaches, as recorded by various writers who have studied these terraces, were plotted upon one diagram, and consideration given to the apparent difference in relative ages of their ordinates, we should find that,

1. These terraces resolve themselves into several distinct systems.

2. All these terraces are found with rising inclination to the *true north*—the most recent terraces, the upper member of which would have elevation if extended to the pole of about 1,467 feet, disappear, at the equator, into the present sea level. The older and more elevated terraces pass the equator at some considerable distance above the present sea level.

3. The upper terrace of the more recent series, corresponds with the upper surfaces of the so-called glacial lakes, Agassiz, Ohio, Warren, Algonquin, Iroquois, St. Lawrence, Gulf of Winnipeg, etc. It also corresponds with the upper surface of the Lafayette flood, and with the waters of the Champlain and Matanzas submergences. By this correspondence or absolute confluence in beach lines, it was held that complete demonstration was offered as to a similar confluence in all above-named water bodies.

4. The law of inclination found in these terraces is that the rising gradient especially of the younger terraces, increases to the north approximately as the sine of the latitude.

Mention was here made of some of the inferences that would properly follow in case the peculiarities in structure of beach lines as above noted, should be confirmed. For instance, a most logical decision would be that the extraordinary symmetry in these curves offered assurance that no motion of the earth's crust had taken place since the epoch of this elevated sea.

Another assumption might be made, as the mathematicians have shown its competency, that this northern flood may have been caused by a slight shifting of the earth's center of gravity under the effects of a polar ice cap.

Still another inference might be that the great ice dams urged in explanation of the raised beaches were no longer necessary.

The effect of the earth's rotation upon ocean currents was discussed and the matter of deformation of sea level by ocean currents mentioned and attention called to some of the perplexing differences in levels of confluent water bodies thus arising.

Ralph Arnold,
Secretary

THE BIOLOGICAL SOCIETY OF WASHINGTON

The 435th meeting was held December 14, 1907, President Stejneger in the chair.

Dr. M. X. Sullivan read a paper on "Toxic Bodies arising during Plant Metabolism," illustrating it with many photographs.

Many of the products of the life activity of plants have been tested as regards their toxicity to wheat and a number of these substances have been found toxic.

Wheat was grown successively in the same soil until the growth was poor. Investigation of the soil showed that toxic substances had been deposited therein during the growth of the plant. The absolute identity of the substances in plant and soil is yet to be ascertained.

Cowpea was grown in soil until the yield was slight. From this soil was obtained a crystalline body toxic to cowpea. To wheat in the same concentration the substance was beneficial.

The conclusion to be drawn from the paper is that the decrease in yield of plants grown successively on the same soil is due predominantly to substances arising in the metabolism of the plants and exuded from the seedling and roots.

Mr. A. H. Howell read some "Notes on the Migration of Bats," which will be published in the *Proceedings* of the society.

The 436th meeting was the 28th annual meeting for the election of officers. The following were elected for the ensuing year:

President—Leonard Stejneger.

Vice-presidents—T. S. Palmer, W. P. Hay, E. L. Greene, E. W. Nelson.

Recording Secretary—M. C. Marsh.

Corresponding Secretary—W. H. Osgood.

Treasurer—J. W. Gidley.

Councilors—A. D. Hopkins, J. N. Rose, A. K. Fisher, A. B. Baker, David White.

President Stejneger was nominated as a vice-president of the Washington Academy of Sciences.

M. C. MARSH,
Recording Secretary

THE AMERICAN CHEMICAL SOCIETY. NEW YORK SECTION

THE fourth regular meeting of the session of 1907–8 was held at the Chemists' Club, 108 West 55th Street, on January 10.

Dr. McMurtrie read a short obituary of the late Peter Townsend Austen who was closely identified with the section since its foundation. Dr. Austen served twice as chairman and contributed much to the society from his vast fund of information and experience in the field of chemistry.

Mr. T. J. Parker described the winter meeting in Chicago, speaking of the elaborate preparations made and the cordial reception extended to visiting chemists, of whom there was a good representation. Mr. Parker also spoke of the business transacted by the council, especially that relating to the publication of a journal of industrial chemistry. This journal together with those now issued would place the American Chemical Society ahead of any society of its kind in the extent of chemical knowledge recorded in its publications.

The following papers were read:

"Drop Weights and the Law of Tate. The Determination of the Molecular Weight in the Liquid State by the Aid of Drop Weights," by J. L. R. Morgan and Reston Stevenson.

"Note on the Precipitation of Zinc as Sulphide," by W. Geo. Waring.

C. M. JOYCE,
Secretary

DISCUSSION AND CORRESPONDENCE

BAPTANODON NOT A "TOOTHLESS" ICHTHYOSAUR

WHILE it may appear to be ungracious to point out the errors of others, especially of those who are valued scientific friends, nevertheless scientific accuracy and the truth of nature sometimes make it necessary to do so.

In the year 1880 Professor O. C. Marsh coined the word *Baptanodon* as the generic name of an ichthyosaurian which in the previous year he had designated as *Sauranodon*, which was preoccupied. Both names indicated the toothless character of the creature for which they stood, and Professor Marsh in his writings maintained the toothless character of *Baptanodon*.

In January, 1905, Dr. Henry Fairfield Osborn published an article in the *Century Magazine* upon ichthyosaurs, in which he speaks of the Jurassic ichthyosaurs included in the genus *Baptanodon* as "belonging to a race which, like certain of the whale tribe, lost their teeth because they had selected for food the softer marine organisms, such as the squids." Elsewhere he speaks of them as "toothless sea-robbers."

In hastily glancing over the pages of the second revised edition of Professor W. B. Scott's "Introduction to Geology," I discover on page 692 the following statement: "*Baptanodon*, found in Wyoming, is an ichthyosaur without teeth, and must have fed upon small and soft marine invertebrates, as do the toothless whales."

As both Professor Osborn and Professor Scott address themselves in their writings to large audiences, and their repetition of the error into which Professor Marsh fell, if backed by their great names, is likely to become very widely accepted, it seems proper for me to call the attention of men of science to the fact that in December, 1902, Mr. C. W. Gilmore in the columns of SCIENCE, N. S., Vol. XVI., pp. 913–914, called attention to the fact that *Baptanodon* was *not* a toothless reptile. Early in the spring of 1904 the Carnegie Museum published a Memoir by Mr. Gilmore entitled "The Osteology of *Baptanodon* Marsh," in which, at page 98, he shows that *Baptanodon*, like the English *Ophthalmosaurus*, is provided with teeth, and figured the teeth, and on page 121 he alludes to the fact that a tooth exists in the jaw of the type of the genus, No. 1,952, preserved in the collections of the Yale Museum, a fact which Professor Marsh had entirely overlooked.

Baptanodon is a misnomer, which, neverthe-