mollusks, thirty species of brachiopods are enumerated, the richest recent brachiopod fauna known, and it may be added that Mr. J. E. Ives has given an account of the Echinoderms, Crustacea and Pycnogonida collected by Mr. Stearns, in the Proceedings of the Academy of Natural Sciences, Philadelphia, for 1891.

W. H. Dall.

ACADEMIES AND SOCIETIES.

THE NEW YORK SECTION OF THE AMERICAN CHEMICAL SOCIETY.

The members of the New York Section of the American Chemical Society dined at Morrello's, on 29th street, on the evening of the 6th inst., and from there adjourned to the College of the City of New York, 23d street and Lexington avenue, for the regular monthly meeting. This meeting was held in the lecture room of Dr. Doremus, to which the Society had been invited by that well-known chemist, and Dr. Webb, the president of the institution.

The meeting was called to order by Prof. P. T. Austen, and after the reading of the minutes of the last meeting, Dr. C. A. Doremus welcomed the Section to its new quarters, and recounted a brief history of the room and the adjoining laboratories, which are now the oldest rooms in the city devoted to chemical research and instruction. Dr. Wolcott Gibbs, now of Newport, and formerly of Harvard College, was one of the earlier instructors and investigators working in this place.

On motion, the thanks of the Section were extended to Dr. Webb and Dr. R. Ogden Doremus for the courtesy and assistance extended in these comfortable and commodious quarters for the Section's work.

The first paper on the program was that of Dr. P. R. Moale, chemist to the New York and Boston Dyewood Company, entitled, 'A Brief History of Naphthalene.' This brief history proved to be an exhaustive statement of the progress of the development of naphthalene from its first separation by Garden in 1820 from the scale of the condensing vessels used in the distillation of coal tar, believing it to be camphor or something similar thereto, through the work of Faraday, begun in 1826, Reichenbach, in 1831, to the later work of Dumas, Liebig, Wohler, Stas, Mitscherlich and Laurent, De Saussure and others.

Passing from the history of the formation and occurrence of this body, the reader took up the composition of the compound, presenting results of analyses by the several noted authorities.

Opperman's result	$C^{20}H^{3}C^{2}H^{2}$
Liebig and Wöhler	$C^{20}H^{3}C^{3}H^{3}$
Berzelius	$C^{10}H^{4}$
Laurent	$C^{10}H^{4}$ or $C^{46}H^{16}$
Faraday	$C^{20}H^{3}$
Dumas	$C^{40}H^{16}$
Dumas and Stas	$C^{30}H^{16}$

The reader then took up the constitution of the compound. Beginning with the investigations of Kolbe and Marignac in this regard he discussed the results obtained by Berthelot, Ballo, Graebe, Liebermann, Arnheim, Wreden, Claus, Baeyer and Perkin, Fittig and Erdmann, Bamberger; and from which it has been shown that the formula established by Graebe is that which must at present be accepted as nearest the truth.

In the discussion which followed, of the theoretical constitution of naphthalene, Mr. H. S. Neiman was called upon, and gave his experience in attempting the synthetic preparation of naphthalene for the purpose of throwing light on its constitution. He stated that the decomposition of certain amido-naphthal-sulpho-acids having a tendency to show that the position of the double bonds in the naphthalene ring are not symmetrical, attempts were made to disprove this by the synthetic production from ortho-xylene-tetra-bromide and ethane. By passing ethane over a heated mixture of granulated pumice stone and ortho-xylene-tetra-bromide, a portion of naphthalene was formed, but circumstances prevented further investigation. This formation would seem to show that the central bond is a double one, and the formula a symmetrical one as far as the bonds are concerned.

The second paper on the programme, that of Dr. T. B. Osborne, of the Agricultural Experiment Station at New Haven, Conn., on 'Vegetable Proteids,' is an exhaustive resumé of the classic work of the author upon these interesting and really little known bodies. He reviewed first the earlier investigations of these compounds, particularly those of Einhof, Berzelius, Dumas and Cahours, Ritthausen, Weyl

and Liebig, setting forth the state of our knowledge of the subject at the time of taking up his own study of it, and showing the tendency of professional opinion to the effect that a very close relation exists between the proteids of seeds and those of the animal system. The results of Dr. Osborne's work show the fallacy, except in a general way, of this opinion, and set forth the reasons why it cannot be accepted.

He takes up the proteids of the seeds in systematic order, beginning with the most soluble, and discusses the pertones, proteoses, albumins, globulins, glutinoids, alkali-soluble proteids, and neucleo-albumin and nuclein. He separates these substances by means of solvents such as alcohol, strong and dilute, salt solutions, weak alkali solutions, and precipitating them from the solutions by various reagents, obtains them in forms in which they may be studied. The results he has secured in this way are of the highest interest and value to the history of this class of bodies.

The third and last paper on the program was that of Dr. J. H. Wainwright, of the United States Laboratory, in this city, on 'The Determination of Solid Fats in Artificial Mixtures of Vegetable and Animal Fats.' His method consists in subjecting the mixture to pressure at the ordinary temperature of the laboratory, about 70° F. Much lower or much higher temperatures he finds detrimental to accuracy, as at 60° considerable of the higher melting point constituents are retained, while at 80° F. and above much of the low melting point constituent is removed. The method was devised particularly for the separation of compound lards containing cotton-seed oil, lard and stearine, with the special object of determining the percentage of oleo-stearine, which, in the presence of lard, could not be satisfactorily done by the ordinary methods where the information was obtained from the iodine number and other constants. Results were obtainable by this method within 1 per cent., but at present, until further investigated, the author allowed 1½ per cent. either way, or a total error limit of 3 per cent. in reporting results.

The General Secretary called attention to the time and place of the next and twelfth general meeting of the Society, which will take place on the 30th and 31st of this month at Cleveland, Ohio, and at which an unusually interesting and valuable program will be presented.

The next meeting of the New York section will be on the 10th of January.

DURAND WOODMAN,
Secretary.

THE ANTHROPOLOGICAL SOCIETY OF WASHINGTON.

THE regular meeting of the Society was held on Tuesday evening, December 3d.

Dr. Otis T. Mason read a paper on the 'Influence of Iron Upon Native American Arts,' of which the following is an abstract:

Aboriginally the manufacture of iron was unknown upon the American continent. The native races, after receiving it, treated it as stone and worked it cold; they have nowhere become skillful in the use of it.

The term 'native American arts,' in common parlance, is ambiguous, now signifying all that the aboriginal tribes do and all that is collected from them; at another time it is made to mean only that part of their activities which they had in pre-Columbian times; at still another time the term is restricted to what the peoples of the Western Hemisphere themselves originated.

To get at the last two, there must be carefully eliminated everything added and suggested by the intrusion of the Iron Age, and everything must be restored that was crowded out, and supplanted by iron and its productions.

This elimination can be intelligently made only by knowing intimately what each intruding people had to bring, and really did bring. The history of America demands a study of the Eastern Hemisphere, especially the folk element and the folk arts in it. One must just as thoroughly know the stocks from which the intruders came. By studying those who came, what they brought, those to whom they came, the knowledge of the added result will be gained. A fact usually entirely overlooked in this connection is this, that as early as 1505 Ovando solicited that no negro slaves be sent to Hispaniola, because they fled among the Indians, taught them bad customs and never could be captured. In 1517 the slave trade was authorized by Charles V, and during three hundred

years, down to the time when scientific studies of the aborigines began to be made, five or six millions of slaves had been imported, a number equal to the entire native population of both Americas.

In the first half century middle America and South America were Latinized. The Dutch, French and English had monopolized North America in its northern and eastern portions two centuries ago. The Russians for more than a hundred years have contaminated the native arts of the northwest. Nine hundred years ago the Scandinavians invaded Greenland and six hundred years ago they were absorbed or killed by the natives.

The earth, even, does not divide the old from the new. The insidious iron is in shell heaps, in mounds, in cemeteries, in huacas and in ancient works of art.

Since these things are indisputably so, it behooves the true ethnographer, the true archæologist, the true linguist, the true historian, to enter into a friendly coöperation to reconstruct the native activity.

There are some things in favor of the true science, in spite of fraud, insufficient data and false labeling. There is, no doubt, a home flavor, a harmonious agreement among all the works of a people and the environment. The iron arrow-head is always coupled with a shaft covered with color and cuttings of an older age. The very shape and application of the new will conform to the methods of the old, though that be not the easiest.

In these transitions the old will sometimes excel, sometimes fall far below the new. Wherein the use of iron was adopted native art improved, wherein it was not useful native arts declined. It is not true that all good things are old or that all old things are good.

The modern contaminated native art is not to be despised, but when correctly understood it not only reveals to us the old that was concealed in it, but it suggests to the thoughtful man many of the roads and methods by which accultivation may proceed.

Major J. W. Powell, President of the Society, read a paper on *cognition*.

George R. Stetson,
Recording Secretary.

GEOLOGICAL CONFERENCE OF HARVARD UNIVERSITY, NOVEMBER 26, 1895.

Some Causes of the Imperfection of the Geologic Record. By N. S. Shaler.

Our treatises on geology have as yet not given quite enough attention to the array of causes which have tended to bring out imperfections in the geological record. The ordinary accidents of erosion, metamorphism, and the deep covering of beds by subsequently deposited strata have been taken into account, but there are a number of considerations which do not as yet appear to have been fully discussed, without essaying anything like a full presentation of these neglected influences certain of them will here be presented.

First it is to be noted that the record which we seek to interpret is to a great extent made either by the mechanical history of strata or by the organic events which are recorded in them. Certain influences tend in general to bring these divisions of the record into marked contrast with each other. When the process of deposition goes on with great rapidity the result is naturally a section of great thickness, but one which is likely to be barren or of limited fossil contents. Such a set of deposits on account of its great depth is likely to withstand erosion in an effective way and may remain for ages as the record of a time that has left no other monuments; on the other hand, the deposits of the period in question which are of an organic character are likely to be relatively thin, and if they be composed of ordinary limestone are very much more exposed to the assaults of decay.

Wherever we have extensive deposits of calcitic limestones the beds are exposed not only to superficial erosion and the like work of cavern streams, but also to a solutional process which with considerable rapidity may remove the materials composing the beds for all the depths to which the surface waters penetrate. In central Kentucky the spring waters are annually removing from the rocks in the dissolved state nearly as much rock matter as is eroded by the superficial streams. The result of this processs will be in time to leave the numerous arenaceous layers which are generally unfossiliferous and to remove the limestone beds which contain the most important part of the record. In this way we may perhaps account for the

relative absence of limestones in the rocks of the pre-Cambrian deposits without trying to assume that those sections were formed under substantially azoic conditions.

The more important records of geological successions have been made on the sea floor which is near the shore. At the present time by far the richest field for the development of marine life is in this narrow belt. It is likely that in early times the proportion of deep-sea species was less than at present and that in the paleozoic horizons the deeper sea may have been comparatively lifeless. But this zone of the richest marine life is precisely the part of the sea floor which is most likely to be subjected to destructive actions. We now recognize that the continents are subjected to successive oscillations which bring this littoral district again and again through the mill of the surf in the alternating movements of elevation and subsidence. Thus the portion of the earth's surface which contains the most valuable part of the geological record is the most exposed to the influences which tend towards destruction.

T. A. JAGGAR, JR.,
Recording Secretary.

ALABAMA INDUSTRIAL AND SCIENTIFIC SOCIETY.

AT the meeting on November 22d, President Thomas Seddon in the chair, the following papers were read and discussed:

Mobile Point as the Deep Water Harbor of the Gulf of Mexico. By G. D. FITZHUGH, of Birmingham.

Alabama Barite, or Heavy Spar. By HENRY MCCALLEY, assistant State geologist, of Tuskaloosa.

Atabama's Resources for the Manufacture of Portland Cement. By DR. EUGENE A. SMITH, State Geologist, University.

The Value of the Raw Materials in Iron Making. By DR. WILLIAM B. PHILLIPS, of Birmingham.

The Pig Iron Market, Its Extent and How to Improve It. By JAMES BOWRON, of Birmingham.

Mr. T. H. Aldrich gave a short talk on his recent efforts in prospecting for gold in eastern Alabama, in the counties of Cleburne, Randolph and Tallapoosa.

On motion of T. H. Aldrich the following committee was appointed to arrange for the compiling of statistics on the mineral and iron industries in the State for the purpose of circulating the same monthly to the technical journals, commencing in 1896: Mr. Thomas Seddon, Dr. William B. Phillips and the Secretary.

Dr. William B. Phillips gave a short account of the progress in his experiments in concentration of Red Mountain iron ores.

EUGENE A. SMITH,
Secretary.

ACADEMY OF SCIENCE. ST. LOUIS, DECEMBER 2, 1895.

THE Academy held its regular meeting at the Academy rooms, with President Green in the chair and twenty-three members and visitors present.

Dr. H. C. Frankenfield presented a communication on 'Hot and cold Waves' and 'The Deficit in Rainfall During the Past Three Years.' He spoke of the hot waves being caused by low areas, appearing in the northwest and moving east and south, thus bringing about warm winds from the south, and disappearing on the development of high areas in the northwest.

One of the accompanying phenomena of hot waves was hot winds coming from the southwest, their cause being somewhat obscure. Dr. Frankenfield stated that as a rule they move in narrow belts, ranging from 100 feet to half a mile in width. No good cause can be assigned for this, save, probably, local topography. One of their characteristic phenomena is a tremulous motion of the atmosphere, similar to that caused by heated air from a furnace. Also sudden abnormal rises in temperature, one instance being cited of a rise of 7 degrees in ten minutes.

The origin of cold waves is likewise very much mooted. As a rule a low area is followed by a high one, bringing a cold wave with it, but this is not invariable, as the cold wave occasionally comes without the low area, and sometimes without the high.

One theory as to where the cold air comes from is that of the descent of this cooler air from the extreme upper regions; the other theory, that it is simply the cold air of the surface, made so by radiation. In general it may be stated

that a high area acts as a carrier to a cold wave. The most severe cold waves are those in which the low area extends in a long and narrow, trough-shaped depression from the northeast to the southwest.

Dr. Frankenfield regarded the question of drought purely as one of distribution. The rainfall might be normal during a year, yet there would be a severe drought at a certain season of the year, simply because the rainfall was unevenly distributed, being excessive in some months and deficient in others.

Its effect upon the corn crop was illustrated in the case of the present year, where there was a general deficiency of rainfall and yet sufficient precipitation in the late spring and early summer to insure the safety of the crop. Commencing in August, there was an abnormal deficiency, but this was too late to affect the crop.

Mr. Allerton S. Cushman gave an informal talk on the present state of our knowledge regarding Helium, showing that it has been definitely proved that Helium is not a simple elementary gas, but in all probability a composition of two or more elementary gases.

A. W. Douglas,
Recording Secretary.

SCIENTIFIC JOURNALS.

THE AMERICAN GEOLOGIST, DECEMBER.

The first article is by Prof. N. H. Winchell, and is devoted to the comparative taxonomy of the rocks of the Lake Superior region. This is the last in a series of ten papers under the heading 'Crucial Points in the Geology of the Lake Superior Region,' the object of which has been to review and criticise the Correlation Papers on 'Cambrian' and on 'Archean and Algonkian,' by Messrs. Walcott and Van Hise respectively. Aside from questions of nomenclature, in which, as noted in these columns before, Prof. Winchell differs from those authors, he emphasizes two fundamental differences between his classification and that proposed in the Correlation Papers. First, he maintains the *absence* of a great erosion interval between the upper sandstones of the Keweenawan and the horizontal sandstones (Upper Cambrian) of this region; and secondly, he separates from the Keweenawan certain igneous rocks, especially the gabbros, which have usually been included in that formation. The paper is accompanied by a table giving a comparison between the classification adopted by the author and that used by the United States Geological Survey.

Mr. Oscar H. Hershey discusses the history of the river valleys of the Ozark Plateau from Jurassic time to the present day. He recognizes several periods of depression and deposition and of elevation and erosion, and summarizes these periods as follows: 1, Jura-Cretaceous peneplain; 2, Teritary valleys; 3, Lafayette formation; 4, Quaternary valleys; 5, Columbia formation; 6, the present valleys.

Prof. F. W. Cragin, in a paper of nearly thirty pages, gives a careful account of the Belvidere (Comanche Cretaceous) beds of southern Kansas. The typical section noted is called the Elk-Otter section, and this is described in detail, and the fossils characterizing the different beds are listed. The paper includes a statement of the classification of the Comanche divisions and terranes as adopted by the author.

Under 'Correspondence' Prof. G. Frederick Wright presents the views of Dr. N. O. Holst on the continuity of the Glacial period as expressed in a recent paper by that author entitled 'Has there been more than one Ice age in Sweden?' The usual reviews of current geological literature, list of recent publications, and personal and scientific news are given; under the latter is a statement concerning the operations of the Geological Survey of New York during the year.

NEW BOOKS.

Lehrbuch der Botanik. Drs. Strasburger, Noll, Schenck and Schimper. Second edition revised. Jena, Gustav Fischer. 1895. Pp. vi + 556. M. 6.50.

Lehrbuch der Entwicklungsgeschichte des Menschen und der Wirbelthiere. Oscar Hertwig. Fifth edition revised. Jena, Gustav Fischer. 1895. xvi + 612. M. 11.50.

Geological Survey of New Jersey: Annual Report of the State Geologist for 1894. Trenton, The John L. Murphy Publishing Company, Printers. 1895. Pp. ix + 303.