suicidal, to establish facts in any other way than by observation. No vote of the most august scientific body can possibly establish a fact, and no vote can have any weight against a good observation." On these grounds, Mr. Gilbert said, "I am opposed to the classification by the congress of the sedimentary formations, and likewise to the classification of the volcanic rocks, and I also regard it as ill advised that the congress undertook the preparation of a map of Europe, for that — if more than a work of compilation — is a work of classification;" and "a classification, if it has any value whatever, is merely a generalized expression of the facts of observation, and is outside the domain of the voter."

The section was well prepared, after hearing this address, to listen on Friday to several abstracts of reports of semi-official character, by the various individual 'reporters' of the American committee, and submitted to it for approval at the recent meeting at Spring Lake. These were all read by Dr. Frazer, secretary of the committee, before discussion was opened, and their good judgment and conservatism excited general approval. The abstract presented by Dr. Frazer demands especial attention, both from the care in its preparation, and from its including at once a discussion of certain general principles, and of that most difficult of geological divisions, the Archæan; and it is to be hoped that these reports may be given to the association for publication, as expressing the matured opinions of many able workers on questions most frequently before American geologists. Among the paragraphs of Dr. Frazer's report, the following will doubtless be generally commended: "American geologists will acquiesce in the recommendations of the committee by sacrificing individual opinion to a reasonable degree, provided that these recommendations do not hamper the efforts of research by requiring more correlation of beds between the two continents than research can justify." "Until such time as the Archæan rocks can be correlated with each other in distant parts of the earth, it is best that geologists should distinguish them from each other petrographically, without attempting to ascribe more than local chronological value to such distinctions." On the other hand, the recommendation that all pre-Cambrian rocks should be called Archæan savors too much of pre-judgment, especially in view of the recent studies of Irving and Walcott. The possible metamorphism of eruptive rocks was properly emphasized; and, as they are thought to differ more as a result of such changes than by conditions characteristic of their eruption, their classification by composition as indicating age is not recommended.

The most animated discussion occurred over the recommendation that it should be "officially declared that neither the color-scheme for the proposed map of Europe, nor the classification of the eruptives of Professor Lossen, provisionally adopted by the map committee in order to bring out the map, are other than tentative schemes, subject to alteration when their application to the map shall have shown to what extent they are deficient." It was strongly objected by Major Powell that this implied the official adoption of the color-scheme alluded to, in case serious defects were not discovered in its test on the European map, and that it did not sufficiently dwell on the fact that the scheme of colors had been devised only by a committee of the congress, and not by the congress itself. A resolution approving the action of the committee, and hoping for its continuance, was adopted in the evening session; but it may be mentioned that it received only two or three affirmative votes, although the session was well attended at the time.

It is difficult to choose among the many papers read before the section, and we mention only the few that our space allows. Prof. H. S. Williams presented a model paper on the different types of Devonian in America; Mr. Hill gave the results of his recent studies in Texas; Professor Claypole described 'Lake Cuyahoga,' an extinct glacial lake in Ohio; Mr. Walcott contributed a paper on the so-called 'Taconic,' that promises, with his other studies, to bring about accord on this vexed problem; and Dr. G. H. Williams gave an excellent general account of petrographic methods and their application. These titles can only suggest others of like interest that are regrettably omitted from our report.

Section F.

THOSE who think that scientists are seriously divided on the question of evolution would have come to a different conclusion by attendance at the Biological Section during the meeting of the American Association, just closed. Reputable scientists no longer avoid the question as formerly, or mention it only in defence, but accept it as the basis for the discussion of questions of structure and classification. Dr. Farlow, vice-president of the section, following in harmony with the subject chosen by the president of the association, Professor Morse, chose for his subject 'Vegetable Parasites and Evolution.' Botanists have a smaller basis than zoölogists for the study of development, owing to the incompleteness of the paleontological record, especially with reference to the lower plants, to which most parasites belong. The study of different degrees of parasitism has, however, rendered it probable that parasites may have originated at a remote period from non-parasitic plants, first as saprophytes, then as true parasites. The parallelism which exists between algæ and fungi seems also to indicate that the different groups of fungi have arisen from corresponding groups of algæ at different periods in the process of evolution.

The paper of Professor Cope, on the mechanical origin of the suctorial teeth of the *Carnivora*, showed in a striking manner the value which mechanical force may in some cases have as a factor in development. His statement, also, that a given structure may or may not be the best which could be devised for performing its particular function, but that it must be such as could be developed from a pre-existing form, is one which, if earlier understood, would have saved much misdirected effort.

Among the other papers presented, that of Professor Cook on the antennæ-cleaners of *Hymenoptera*, the series of structural papers by Dr. Beal, that of Dr. Schrenk on *Brasenia peltata*, and the papers on morphology by Professor Baur, were excellent examples of the present methods of study. The paper of perhaps the most practical importance was that of Dr. Rusby, on the cultivated cinchonas of Bolivia.

In the treatment of the topics relating to classification, there was manifested a tendency to restrict the number of species and increase the number of varieties. In regard to terminology, there was exhibited on one or two occasions a decided opposition to the introduction of comparatively unimportant new terms.

The proportion of botanical to zoölogical papers presented before the section was less than last year, although the attendance of botanists was greater. There is still a general desire, on the part of the botanists, to confine the discussions and short papers chiefly to the botanical club, and the necessity is felt of providing more time for that purpose. Among the work of the club was the appointment of a committee, consisting of Drs. Vasey, Britton, Watson, Morong, and Halstead, to devise a system for the exchange of specimens.

One of the most enjoyable features of the meetings was the excursions provided by the citizens of New York and the local societies. These gave an opportunity for the members to become acquainted, and to compare personal notes. Of especial interest was the excursion of the botanical and entomological clubs to Sandy Hook, which included an informal 'field-meeting' on board the boat during the return. Much is due from botanists to the Torrey Botanical Club, which, besides the delightful entertainments provided, furnished sets of the local plants to those in attendance.

Section H.

THE meetings of this section are always interesting on account of the great variety of papers read. At the present meeting the discussions were more lively than they used to be, and this is due to the skilful vice-president, Dr. D. G. Brinton, who encouraged discussion in every way, and, by giving summaries of the doubtful points, elicited remarks from all interested in the subject.

Among the different classes of papers, archæological ones take a prominent place. This is somewhat remarkable, when we consider that in many parts of America we have still the very best opportunities of studying the natives themselves; but the antiquity and doubtful origin of relics have always proved a stronger incentive for scientific remarks than the living neighbor, to whose customs and strange appearance we become accustomed. The most important one among this class of papers was Professor Putnam's report on the purchase of the serpent-mound of Adams County, O., by a number of ladies,

who presented the deed to the trustees of the Peabody Museum of Cambridge. Professor Putnam's report, in connection with a brief letter from Miss Alice Fletcher, led to an important discussion on the preservation of mounds and relics, and the opinion was expressed unanimously that some step must be taken in this direction. In order to impress the United States and the State governments and legislatures with the importance of this matter, it was moved that the association, in a general session, appoint a committee whose task it should be to take the necessary steps in this direction. Mrs. Stevenson, president of the Ladies' Anthropological Society of Washington, and Miss Fletcher, were elected members of the committee. Major Powell's remarks on the difficulties which would be encountered in carrying out the proposed scheme, and the fact that attempted 'preservations' had sometimes ended in actual destruction, led to the election of a second committee of five members, for impressing the State historical societies and legislatures with the importance of the matter, and inducing them to preserve the relics in their territories, while the former committee will draw the attention of Congress to those situated on public lands.

The desire to draw greater attention to archæology was also characteristic of Prof. Thomas Wilson's paper on the state of archæology in western Europe. He showed that in America, though the interest of the public is increasing, nothing equal to the work of European nations has been done. Scandinavian archæologists ought to be our teachers in this line of research: they were the first to work out scientific methods and to undertake researches on a great scale. Professor Wilson laid great stress on the influence of European societies and scientific institutions and of the support of the government upon the rapid development of prehistoric anthropology.

The papers and discussions on archæological subjects showed that a closer connection between geologists and archæologists is very desirable, or, rather, that the student of archæology ought to be conversant with dynamical geology, more particularly with the influence of water and wind upon the earth's surface. This is the only method to avoid serious errors and to reach satisfactory results. Prof. C. C. Abbott's method, which he explained during the sessions in numerous remarks and in his paper on evidences of pre-Indian occupation of New Jersey, makes it clear that this is the most satisfactory method of study. Of course, the form of the implements must also be considered. Dr. Brinton's suggestion, that the occurrence of simple implements and of compound implements (i.e., those in which the worked stones are attached to handles) should be made a principle of division of the paleolithic age, may be accepted in so far as we must suppose, *a priori*, that simple implements were the earliest inventions of developing mankind. It is, however, doubtful whether the finds really justify a separate consideration of both ages. The important question of the age of American antiquities, and whether they belonged to the Indians inhabiting the continent at the time of the discovery or to a pre-Indian race, received its proper share of attention. Besides Professor Abbott's paper, which was mentioned above, Mr. G. N. Perkins's remark, that in the Champlain valley a steady development of forms, from the most ancient to the recent ones, may be observed, deserves to be mentioned.

The desire of tracing the earliest history of man in America, which is the most vigorous inducement of American archæology, was also the basis of Horatio Hale's paper on the true basis of ethnology. A few weeks ago Major Powell had expressed, in a letter to *Science*, the opinion that there can be no ethnology, as all attempts to classify mankind have failed. This refers to ethnology, as defined by Powell, as the science treating of the classification of mankind. Professor Hale opposes this opinion, maintaining that the languages afford a sufficient basis for the classification of man into races. Major Powell, in defence of the position he had taken, said that languages, customs, and religions were only adhering to the individual, while the anthropological character was the only constant phenomenon. But here, as well as in the ethnological characteristics of races, admixtures of blood had made it impossible to reach satisfactory results. This elicited the important remark from Dr. Brinton, with which we heartily concur, that language and religion of the individual may be easily changed, but that tribes and races do not so readily adopt new social institutions and new languages, and that not the individual, but the tribe, is the important object of study. His opinion is, that the psychology of nations is the true basis of ethnology, and we may add that the history of civilization is its ultimate aim.

Methods of ethnological researches are making steady progress. This is shown by the papers of Dr. Wesley Mills, on the study of a small and isolated community in the Bahama Islands; and by that of Mr. Steward Culin, 'China in America.' The former is a contribution to the solution of the problem of the influence of monotony in climate and social institutions upon man: the latter treats of another interesting question which is of the greatest importance in studying the history of mankind, — the constancy of ethnological peculiarities, and the influence of one people upon another. Papers treating of the ethnology of certain tribes were comparatively few. Great interest was excited by two specimens shown by Mr. G. F. Kunz, — a gigantic jadeite adze from Oaxaca, Mexico, which shows signs of being cut from a bowlder by the use of a string, and is beautifully carved and polished; and a very remarkable human skull of rock crystal in natural size, probably of Mexican origin. On this occasion we had the pleasure of hearing the assumed similarity between the Mexican and Japanese arts thoroughly refuted by Mr. Tatui Baba. In fact, the task of proving the similarity rests on the shoulders of those maintaining its existence.

The last paper we have to mention is that by Mr. J. Jastrow, on sensory types of memory and apperception. He discussed apperception as brought about by visual and auditual perceptions, and treated of the connection of both kinds of perceptions in many individuals. He referred to the important bearing of this question on education, as different methods must be applied for the two classes of individuals. He gave some methods for determining the prevailing faculty. His opinion is, that the visualists form the more numerous class, but we believe that the universal existence of language shows the importance of auditualism. Researches in experimental psychology, such as Mr. Jastrow undertakes, are not yet carried on to a great extent in America, but we may hope that in course of time they will become an important feature of the sessions of the Anthropological Section, as this branch of science is one of the foundations of the psychology of individuals and of nations.

Section I.

[*Report not received in time for this issue.*]

THE GEOGRAPHICAL MOVEMENT IN ENGLAND.

I WAS asked some time ago to furnish *Science* with an account of the results of the efforts of the Royal Geographical Society towards the improvement of geographical education in England, and to give some idea of the character of the collection of appliances exhibited in London and elsewhere in connection with this movement. I have waited till now in order that I might be able to state positively that so far the society's efforts have met with almost complete success. The University of Oxford has just appointed a reader in geography; not only so, but the appointment has been given, I believe I am safe in saying, to the only one among the numerous candidates likely to carry out the views of the Geographical Society as to what the geography of the future should be. Mr. Harford J. Mackinder, the new reader in geography, is a young graduate of Oxford, who has taken high honors both in science and in history, and thus is qualified to treat geography adequately on all its sides. As one of the lecturers in connection with the Oxford University extension scheme, he has attended large and enthusiastic audiences in various English provincial towns. What his conception of geography is may be seen from the paper which he read before the Geographical Society, and which is printed in the Proceedings of March, 1887. Cambridge University has decided to follow the example of Oxford in the beginning of next year, and meantime has requested the council of the Geographical Society to nominate one or more of its members to lecture on the subject in the autumn of the present year.

Thus it will be seen, that, so far as our two great universities are concerned, the recent efforts of the society have been completely successful: for it must be borne in mind that the council of the society have all along felt, that, unless geography were recognized