THE AMERICAN ASSOCIATION.

MADISON, Wisconsin, at which the forty-second meeting of the American Association for the Advancement of Science was held, August 17 to 22, is a beautiful little University town, surrounded by clear, glacial lakes, and is the capital of the State of Wisconsin.

Several causes conspired to reduce the attendance of members at this meeting—the distraction of the World's Fair at Chicago, the financial stringency, and the remoteness of the place of meeting from the sea-board, where most of the members reside; but it was characterised by an earnest tone and an excellent quality of scientific work.

At the opening session the retiring President, Prof. Joseph Le Conte, gracefully introduced his successor, Prof. William Harkness, by remarking that while he represented geology, the president-elect represented astronomy: one the oldest, the other among the youngest of sciences; one concerned with the universe of space, the other with the universe of time; one with the law of gravitation, the other with that of evolution; one with the divine method of sustentation, the other with the divine method of creation of the universe.

Addresses of welcome followed by Major Corscot, General Lucius Fairchild, chairman of the local committee, and President C. K. Adams, of the University of Wisconsin, where the meeting was held. The latter gave a brief account of the use of the University, which has always made science prominent, and remarked that we are doubtless on the eve of wonderful discoveries. Physics and chemistry bring us near to the ultimate analysis of matter.

President Harkness, in replying, referred among other things to the British Association for the Advancement of Science as the pioneer of all such organisations. The reports of the condition of science at its organisation, over sixty years ago, were still valuable, and the early star catalogues made under its auspices were a valuable contribution to advancing science. The matter of nomenclature of electrical units was settled by the British Association, and the names, watt, ohm, ampere volt, now universally adopted, originated there.

Thursday afternoon was occupied with the addresses of the several vice-presidents, some of which will be printed in full in later numbers of NATURE. The generally high order of these addresses was matter of comment among members. The subjects presented were "Variations of Latitude," by C. L. Doolittle; "Phenomena of the Time Infinitesimal," by E. L. Nichols; "Twenty-five Years' Progress in Analytical Chemistry," by Edward Hart; "Training in Engineering Science," by S. W. Robinson; "Geological Time as indicated by the Sedimentary Rocks in North America," by C. D. Walcott; "Rise of the Mammalia," by H. F. Osborn; "Evolution and Classification," by C. E. Bessey; "The Biloxi Indians of Louisiana," by J. O. Dorsey; "The Mutual Relations of Science and Stock Breeding," by Mrs. H. Brewer.

The annual address by the retiring president, Prof. Joseph Le Conte, in the evening, on "Present State of Science on the subject of the origin of mountain ranges," was a masterly presentation of that difficult problem by an authority recognised as such throughout the world. The evening sessions were held in the capitol.

The mornings and afternoons of Friday, Monday, and Tuesday were occupied with reading of papers in the several sections.

On Friday evening Dr. Daniel G. Brinton lectured on "The Earliest Men," reviewing the latest discoveries of anthropologists. He localises the first habitat of man in southern Europe or northern Africa, or on the continuation of these latitudes in western or central southern Asia. Man seems to have been evolved *per saltum* from the highest anthropoid animal in the glacial, or possibly just before the glacial epoch, giving an antiquity of 50,000 to 100,000 years. The earliest men, so far as can be ascertained, walked erect, had full foreheads, red hair, and blue or gray eyes, were about of the same size and general appearance as now, perhaps were not even hairy, were kind to each other, social and artistic, had some sort of language, and knew how to make fire. Dr. Brinton's lecture, startling to the uninitiated by the boldness of his conjectures, derived added interest from his subsequent election as president of the association. As an anthropologist and anthropological writer, he has long occupied a front rank. He is a resident of Philadelphia, and a graduate of Yale in the class of 1858. He is a physician by profession, and a native of Chester County, Pennsylvania, where he was born in 1837.

The social features of the meeting were thoroughly delightful. The excursion to which Saturday was devoted deserves special mention, both for its pleasant relaxation and for the scientific interest of the region visited. Taking the cars of the Milwaukee and St. Paul railroad, a favourite tourist route, well known in England as well as in America, which is the only railroad leading to the scenic wonderland selected by the local committee as the best exhibit they could make to their guests, the association first passed through the remarkable driftless area ten or fifteen miles from the city. This is a region much studied by geologists as one which escaped the ice covering which extended over all the rest of the country during the glacial epoch. A ride of an hour and a half brought the train to Kilbourn city, where steamboats were taken up the Wisconsin river a distance of several miles, through "the dells" of that river, which are an expression of erosion resulting from a diversion of the Wisconsin river from its pre-glacial channel by the ice, and by the massive moraines which it produced. The rocks are Cambrian sandstone, and they show false bedding on a magnificent scale.

The places for several subsequent meetings of the association seem to be pretty clearly indicated, though no appointments were absolutely made. The new building of the Brooklyn Institute furnishes a good occasion for a meeting at Brooklyn next year, especially since that is now the only large city in the United States and Canada which has never been visited, if we except San Francisco, to which cordial invitations for a meeting in 1895 have already been received. The policy of the association, ever since its reorganisation at Buffalo in 1866, has been to hold decennial meetings at that city, so that 1896 also seems to be thus provided for.

The officers elected for next year are—president, Daniel G. Brinton, Media, Pa.; vice-presidents (Section A), Geo. C. Comstock, Madison, Wis.; (B) William A. Rogers, Waterville, Me.; (C) Thomas H. Norton, Cincinnati, O.; (D) Mansfield Merriman, South Bethlehem, Pa.; (E) Samuel Calvin, Iowa City, Iowa; (F) Samuel H. Scudder, Cambridge, Mass.; (G) Lucien M. Underwood, Greencastle, Ind.; (H) Franz Boas, Worcester, Mass.; (I) Henry Farquhar, Washington, D.C.; permanent secretary, F. W. Putnam, Cambridge, Mass.; general secretary, H. L. Fairchild, Rochester, N.Y.; secretary of the council, J. L. Howe, Louisville, Ky.; secretaries of the sections; (A) W. W. Beman, Ann Arbor, Mich.; (B) Benjamin W. Snow, Madison, Wis.; (C) S. M. Babcock, Madison, Wis.; (D) John H. Kinealy, St. Louis, Mo.; (E) Wm. M. Davis, Cambridge, Mass.; (F) Wm. Libbey, jun., Princeton, N.J.; (G) Charles R. Barnes, Madison, Wis.; (H) Alexander F. Chamberlain, Worcester, Mass.; (I) Manly Miles, Lansing, Mich.; treasurer, Wm. Lilly, Manch Chunk, Pa.

In Section A (Astronomy and Mathematics) most of the papers were as usual highly technical. The president of the section, Prof. Doolittle, carried on the line of thought presented in his annual address, by a paper on "Latitude Determination at Bethlehem in 1892–3," in which he stated that the fluctuation in latitude thus far noticed does not exceed about 0.4", being therefore less than fifty feet.

An interesting session was held at the Observatory, where the astronomer in charge, Prof. George C. Comstock, read a paper on "A Determination of the Constant of Aberration," and exhibited the instrument employed. It is a modified form of the Loewy prism apparatus, attached to a six-inch equatorial telescope. The principal element of the apparatus is a system of mirrors so placed before the objective as to reflect into the telescope images of the stars which are to be observed. As in the case of a sextant, images of two stars are simultaneously visible, and the apparatus may be regarded as a large reflecting instrument employed like a sextant for the measurement of the angular distance between stars, but subject to the limitation that the distances to be measured must differ but little from 120.° What is thus lost in range of application is compensated by the high degree of precision attainable with the apparatus, a discussion of nearly a thousand observations indicating 0"·3 as the probable error for a single measured distance.

A preliminary discussion of a portion of these observations published in 1892 furnished for the value of the constant of aberration 20"·494. A more rigorous discussion of the whole body of data, taking into account a possible annual variation in the amount of the atmospheric refraction, furnishes a value differing from the preceding by less than a thousandth of a second of arc; but this result cannot be considered definitive, since a comparison of the measured distances with values computed from the known right ascensions and declinations of the stars, indi-

cates the existence in the observations of a systematic error depending upon the amount by which the measured distance differs from 120°. Reasons for supposing the error to be of subjective origin were indicated.

A discussion of the data thus corrected furnishes as the value of the constant of aberration 20″·445±0″·010

As subsidiary results of this investigation it appears that the variation in the amount of the refraction from winter to summer is better represented by Regnault's value of the co-efficient of expansion of air, 0·003670, than by the values adopted in the tables of Bessel and the Pulkowa Observatory. Also, the observations are in very close agreement with the absolute values of the Pulkowa refractions, but indicate sensible corrections to Bessel's tables.

Section B (Physics) was prolific of good scientific work. The stereopticon views, with which vice-president Nichols illustrated his annual address, were a revelation of the astounding resources of photography in depicting phenomena of infinitesimal time, the alternating electric current with light and dark intervals clearly depicted, the flight of a bullet and its attendant sound waves shown as if at rest. Prof. Nichols does not think that he has yet reached the limit of these investigations. Although some of the exposures could only have been for a few millionths of a second, they were always long enough to secure a negative.

Of equal, if not superior, merit was the delicate and accurate apparatus for measuring expansions, exhibited by Profs. E. W. Morley and Wm. A. Rogers, called the Morley interferential comparator. In a paper read before the section, Prof. Morley explained that he had first described the proposed apparatus before a meeting of the Civil Engineers' Club of Cleveland, and afterwards at the Toronto meeting of this association in 1889. It was first used in a simplified form, in an experiment on the magnetic field, by Profs. Morley and Eddy, which was reported to the association at the Indianapolis meeting in 1890. The present paper was designed to recall to mind the principle of the apparatus and method, as an introduction to a paper by Prof. Rogers, in which several series of experiments with it were detailed, and also as a preparation for an exhibition of one of two forms of the apparatus which have been constructed for use in measuring expansions. These have been constructed by Prof. Rogers, with the aid of a small grant from the research fund of this association. It will measure the expansion of a metallic bar five or ten times as accurately as by old methods, being only limited by the accuracy with which temperature can be measured. It consists of two metallic bars, one of steel and one of bronze, with mirrors at each end, so adjusted that any change in adjustment is indicated by interference fringes of sodium light; 90,000 such fringes to the inch may be readily distinguished and counted. The mirrors are probably the most delicate ever made, being plain within two millionths of an inch, thus far exceeding in accuracy the best objectives of the largest telescopes.

Prof. Rogers followed with a paper in which he said that preliminary to the actual use of the interferential comparator in physical measurements, it was necessary to establish three points with great certainty.

(1) Does the value of the relative change per degree in the length of steel and bronze bars of metal, expressed in terms of wave lengths, remain constant? (2) Does the relative length of the two bars compared remain constant at the same temperature after the mirrors have been subjected to extreme temperatures? (3) Does this relative remain constant after the positions of the mirrors have been changed by means of the adjusting screws provided?

As a result of many experiments, an affirmative answer can be given to the two first inquiries. The change for each degree Centigrade was proved to be 38·31 fringes of sodium light for the steel bar, and 64·23 fringes for the bronze bar of Bailey's metal. When the observed differences in length were reduced to 5·1, the point at which the two bars had nearly the same length, it was found that the average probable error in a single comparison was about 0·72 of a single wave length, including all observations at wide ranges of temperature.

The answer to the third inquiry was less satisfactory, as occasional changes of ten fringes were obtained. The source of this error has, however, been found. In the new vacuo apparatus, the mirrors have been matched with great exactness. It was then found that the previous matching had been defective. Prof. Morley has computed the maximum effect of this error in changing the apparent relative lengths of the two bars, and has found it to be fifteen fringes.

The following are a few of the problems to the solution of which the apparatus has been applied :—

(1) The determination of the effect of slow changes in temperature upon the relative lengths of the two bars compared.

(2) The cooling effect of evaporation from a body of water placed near one of the bars.

(3) Measurement of slow changes in the bars compared due to the near presence of the observer.

(4) Measurement of the effect of obscure rays of heat stored in large masses of matter in close proximity.

(5) Measurement of the effect of flexure in changing the length of one of the bars.

(6) Measurement of changes in length produced by placing one of the bars in a magnetic field.

(7) Measurement of the heating effect of a current passed through one of the bars.

(8) Determination of the time required for the complete dissipation of a given amount of heat quickly applied to the bars.

(9) Proof that air is practically a non-conductor of heat.

(10) Determination of the value of 100 mikrons in terms of wave lengths of sodium and mercury fringes.

Prof. Alexander Macfarlane read a paper on the addition or composition of physical quantities, treating of one uniform method of the addition or composition of scalar quantities at different points, of vector quantities at the same point, of vector quantities at different points, of finite rotations round intersecting axes, of finite rotations round non-intersecting axes, and finally of screw motions. The screw motions compounded are not infinitesimal, but may be of any magnitude.

Profs. Macfarlane and G. W. Pierce contributed a paper on the electric strength of solid, liquid, and gaseous dielectrics, in which it was maintained that for a stratum of air or other gas between two parallel metal plates the electrostatic gradient when the spark passes is less the greater the distance between the plates; but for paraffined or beeswaxed paper this gradient is constant; it is also constant for paraffin oil or kerosene. The anomalous behaviour of the gaseous dielectric appears to be due to the greater freedom of motion of the molecules.

Mr. Joseph O. Thompson read a paper on "Fatigue in the Elasticity of Stretching." He remarked that attention was first called to the phenomena of elastic fatigue by Lord Kelvin some twenty-eight years ago. He used the elasticity of torsion in his experiments, and demonstrated that in some cases fatigue diminished the slide modulus as much as 6 per cent. Prof. Thompson's paper called attention to the fact hitherto undiscovered that a similar fatigue can be observed in the elasticity of stretching. Its influence in diminishing the Young's modulus amounted in these experiments to less than ¼ of 1 per cent. The wires used were 23m. long, and the metals in which the phenomenon was observed were silver, steel, and brass.

Messrs. F. Bedell, K. B. Miller, and W. F. Wagner contributed an elaborate mathematical paper on "Irregularities in Alternate Current Curves."

At the meeting of Section C (Chemistry) the notable feature was the presentation of Prof. Morley's final determination of the atomic weight of oxygen, giving results obtained by four distinct methods of investigation and with a degree of accuracy that will render this a final determination of this weight, correct to the third decimal figure. Three years ago Prof. Morley submitted a preliminary report, in which an account was given of the determination of the ratio of densities of oxygen and hydrogen as 15·884, correct within one part in four thousand. It has since been found that an accident happened to the apparatus during the last experiment of the series, which ought therefore to have been rejected. If this were now to be done, the value would become 15·882.

Two years ago some account was given of a series of determinations of the quantities of water produced from weighed quantities of oxygen and of hydrogen. Twelve experiments were made. In one the quantity of water produced was not determined, owing to accident. From the weights of hydrogen and oxygen consumed, the atomic weight of oxygen was found to be 15·8794, with a mean error of one part in 16,000 for a single experiment. From the quantities of hydrogen used and of water produced, the value obtained was 15·8792, with a mean error of one part in 7500 for a single determination.

At the present meeting, Prof. Morley reported the result of twenty determinations of the absolute density of oxygen, and twenty of that of hydrogen. The ratio of these densities found was 15·882.

If now the ratio of the volumes in which oxygen and hydrogen combine is substantially that found in these experiments, the atomic weight of oxygen computed from the densities would be 15·882 from the former series of determinations (or 15·880, if the correction is allowable), and 15·880 from the present series, we should then have :—

15·879, from ratio of H to O
15·879 ,, ,, H to H_2O
15·882 [or 15·880] ratio of densities (*a*)
15·880 from ,, ,, (*b*)

as the result so far of Prof. Morley's work.

But the later work of Scott has attained a high degree of excellence, and gives a value of the ratio of the volumes in which the gases combine, which is considerably higher than that used in this computation. Prof. Morley explained that he had himself published every experiment which he had ever made on this point, and that they had a mean error of only one part in 26,000. Since no source of constant error had yet been pointed out, he had great confidence in the accuracy of his own experiments. He, however, intended to make another series of determinations with the apparatus used before, and one with a new apparatus now constructing.

He also mentioned three other series of determinations which he is now carrying on ; two are determinations of the absolute density of hydrogen, and one a determination of that of oxygen ; in these a very small mean error is attainable.

Among the other papers which attracted special attention, were one on "The Constitution of Paraldehyde and Metaldehyde," by W. R. Orndorff and John White ; and one on "Solubility of Lead Oxide in the normal tartrates and other normal organic salts, with observations on the rotary power of the solutions thus obtained," by L. Kahlenberg and H. W. Hillyer.

In Section D (Mechanical Science and Engineering) the number of papers was small, owing to the increasing tendency of engineers to support special technical associations.

Messrs. Wm. S. Rogers, S. W. Robinson, and J. Burkitt Webb contributed useful notes on different topics ; while the secretary of the section, Prof. D. S. Jacobus, read three papers describing ingenious apparatus devised and used by him at the Stevens Institute of Technology at Hoboken, N.J.

Among the papers read, we note one by Prof. J. J. Stevenson on "the use of the term Catskill," in which he offered strong objection to the application of this term to the whole series of rocks from the Hamilton to the lower carboniferous, as has been recently advocated. Since the group is well defined below, and since the geographical term Catskill represents conditions which prevailed over an extended area only during the latter part of the upper Devonian period, Prof. Stevenson thinks that the term should be restricted as defined by Vonuxem.

Mr. J. A. Holmes gave an interesting description of a map and section of the stratified rocks of the coastal plain of southern North Carolina. Mr. William Hallock reported the results of further observations of temperature in the deep well at Wheeling, W. Va. Since 1891 this well has filled with water by leaking below the surface. Temperature determinations have been made in the water, which are practically identical with the determinations made when the well was filled with air two years ago, showing that there is not an appreciable circulation of water in a hole five inches in diameter. Down to 3200 feet the gradient is 1° F. to 81·5 feet, and near the bottom 1° F. to each 60 feet.

Dr. C. R. Van Hise, referring to the "character of the folds in Marquette iron district," called attention to the fact that what has been considered a synclinal is really a great synclinorium, having a nearly east-west axis, and having both the north and the south limbs pushed under, producing a complex fold with overturned minor folds, and comparable to some of those which Heim has described from the Alps.

Prof. C. D. Walcott exhibited beautiful specimens of trilobites which he had collected from the Utica shale of New York, on which the antennæ and legs were remarkably well preserved. Mr. F. P. Gulliver exhibited beautiful papier maché models, one of the sand plain at Newtonville, Mass., and a second showing the theoretical conditions at the time of its formation.

A paper entitled "Additional Facts Bearing on the Unity of the Glacial Period," was read by Prof. G. F. Wright, consecutively with one by Frank Leverett on "Changes of Drainage in the Rock River Basin in Illinois." The latter is important as affording means of estimating the amount of erosion in interglacial compared with that of post-glacial time. The wide pre-glacial channel of the Rock is followed to the Green River Basin near Inlet Swamp, when it is choked up by accumulations of drift. The change to the present course is located early in the glacial period, since the present valley can be shown to have been opened to about its present size and depth prior to the formation of the kettle moraine of the Green Bay lobe, the gravels which occupy the new course of the river being derived from the ice-sheet at the time the moraine was forming near the head waters of the river. These gravels are traceable up to the head of the moraine as a moraine-headed terrace. It is found that the post-glacial erosion in the river valley is only one-half that accomplished in inter-glacial time, and whereas the post-glacial erosion is mainly in gravel and sand, the inter-glacial erosion was mainly in rock strata. This seems to Mr. Leverett to warrant the use of the term epoch rather than episode to characterise these time relations.

Mr. Warren Upham, in his paper on "Tertiary and Quarternary Stream Erosion in North America," argued from stream erosion that an epeirogenic uplift preceded and probably produced the glacial epoch.

Section F (Zoology) having been severed from botany by the new amendment to the constitution, had comparatively few papers. The president, Prof. H. F. Osborn, carried on the line of thought contained in his annual address, by a paper on "The Mammals of the Upper Cretaceous," in which he proposed a system of classification and evolution materially differing from that of Prof. Marsh, which has so long held its ground. Prof. Osborn's studies lead him to more confidence in the belief that early forms are in many cases pretty highly specialised, and that evolution by degradation plays a pretty important part in biological investigation. This is quite in harmony with the statement of the president-elect of the association, Dr. Brinton, in his public address on "The Earliest Men," above noted, to the effect that the evolution of man appears to have been *per saltum*.

Section G (Botany) was organised at this meeting by division of the old section of biology, and considered a large number of papers of technical interest. Among the contributors were Arthur, Beal, Galloway, Dr. and Mrs. Britton, Barnes, Halstead, MacMillan, Coville. Dr. Britton discussed the question of nomenclature.

Probably the proceedings of the Botanical Club were even more interesting to botanists than those of the section, inasmuch as the club organised the Botanical Society of America with twenty-five charter members. Dr. Arthur exhibited to the club two very interesting pieces of apparatus, one a rotatory machine in which a germinating seed may be placed and subjected for hours or days to centrifugal force instead of gravitation. This apparatus gives the interesting result that the roots grow in the direction of the centrifugal force, and the leaves opposed to it. The other apparatus, called an auxanometer, shows by ingenious automatic action the rate of growth of plants.

Section H (Anthropology) furnished the largest number of papers. The first paper read in the section, by Washington Matthews, on "Songs of Sequence of the Navajos," was illustrated by reproductions of the songs by the phonograph. Dr. Joseph Jastrow gave an account of the system of psychologic investigation now pursued at the World's Fair. The recent discoveries resulting from excavations at the ancient argillite quarries on Geddes' Run, near the Delaware River, were presented by H. C. Mercer ; and Ernest Volk made some observations in regard to the use of argillite by prehistoric people, as illustrated by explorations in the Delaware Valley. H. N. Rust read several papers on California Indians and implements. Prof. G. F. Wright presented a summary of the evidence in favour of the existence of glacial man in America, which commanded general attention because of the personal abuse to which Prof. Wright has recently been subjected. The subject was discussed at some length, and Prof. Wright's conclusions were violently attacked by Mr. McGee. Dr. Brinton read a paper on the "Mexican Calendar System," which he pronounces an anomaly, having no relation to the period either of solar or lunar revolution. It consists of 20 × 13, or 260 days. The 20 is a double digital basis. The 13 seems inexplicable.

The excursion of this section on Monday afternoon gave an opportunity to visit a group of effigy mounds just across Lake

Mendota, about four miles from the University. These mounds are of different shapes, that of the panther predominating, though birds and conical mounds are found also.

Section I (Economic Science and Statistics) had but few papers to consider, of which that of Mr. Henry Farquhar, on "Relations of Production and Price of Silver and Gold," introduced the topic of most general interest just now. The fallacy of attempting to maintain a silver standard of value was very apparent from the paper and the ensuing discussion. Improvements in metallurgy reduce the cost and vastly increase the production of silver, while that of gold remains almost stationary, there being really hardly any metallurgy of gold.

WM. H. HALE.

BRITISH ASSOCIATION.

NOTTINGHAM, SEPTEMBER 13.

THE meeting of the Association, which commences to-day, will take place mainly in the University College. In this building all the Sections, with the exception of the geographical, economical, and anthropological, will assemble. The Sections representing the experimental sciences will be accommodated in lecture theatres built and furnished for the express purpose of illustrating and demonstrating these sciences. Every convenience will therefore be afforded in the meeting rooms for the proper illustration of the papers which will be communicated. Further, the students' laboratories, which are in immediate connection with these theatres, will furnish most convenient exhibition rooms for the illustrative apparatus, specimens, and diagrams during the week of meeting, and when they are not required for illustration in the sectional room. The College will thus become the scientific headquarters during the meeting. It will in addition furnish convenient sectional committee rooms, sectional secretaries' rooms, anthropometric laboratory, ladies' boudoir, smoking-room, convenient retiring rooms, and a large luncheon buffet in the attached public lending library.

It is interesting to compare the facilities now offered for the meeting with those afforded during the preceding meeting in 1866. A temporary exhibition building then stood on the College site, and was used for the *conversazione*, but no suitable meeting rooms existed in the town for housing Sections A, B, C, D, and G. It will scarcely be necessary to inform those interested in the advancement of science that the existence of the College is due to the public spirit of the inhabitants of Nottingham, who willingly voted public money to establish the College, and who now mainly support it from the local rates. That such a bold experiment has met with the full success which it deserved, members of the Association who visit the town will learn and see for themselves. They will find that the initial success is leading to further success, and that outside support from the Government, from the Drapers' Company, and from other sources, is now being accorded with an ungrudging hand. It may be said with truth that since the Association last met in Nottingham, the town has become in a very important sense a centre for the advancement of science, and fully deserves all the encouragement and impetus which will be given to its comparatively new scientific work and aims by the visit of the Association.

It may be added that the Sections which meet outside the College are also accommodated in halls which were non-existent at the previous meeting in Nottingham, and that the evening meetings will take place in a large hall, which is new in the same sense. This will give some idea of the rapid progress which the town has made during the last quarter of a century.

Coming, as the Nottingham meeting does, between meetings at the venerable University towns of Edinburgh and Oxford, the status of the University College of the town must necessarily suffer by comparison. But it will be found that Nottingham, like the other provincial towns which have recently founded colleges in their midst, is by no means altogether at a disadvantage as regards its higher education by making a late start. In the matter of buildings and equipments it has benefited by the experience of its predecessors; and the absence of the fetters of an ancient *régime* has left it free to adapt its curriculum and methods to the needs of the present day.

With respect to the prospective work of the meeting, it may be stated that it promises to be fully up to the average in importance and in interest. A general statement of the papers to be brought forward, and of the discussions in the different Sections, has appeared in NATURE from time to time, and it is unnecessary to repeat the announcement of these in detail. It will be sufficient to remind members that in Section A questions of great interest and importance are put down for discussion; that in Section B, M. Moissan will demonstrate the preparation and properties of fluorine, a demonstration of absolutely unique interest, since this is the first opportunity afforded in this country of seeing these remarkable experiments. The President of the Section C and his colleagues have been most energetic in securing the attendance of distinguished foreign geologists, and in procuring numerous papers of local geological interest, in addition to discussions on points of general importance. In Section D, which will have the advantage of securing the special interest and support of the President of the Association, there will undoubtedly be good discussion of important biological problems, not only by Englishmen, but also by eminent continental biologists, who are guests of the town. In Section E the travellers are mustering in force, and will have their tales to tell of widely distant parts of the earth's surface; the photographs and paintings prepared in Antarctic regions will be of special interest in this section. Economic problems of the day are to be discussed in Section F. Section G will be represented by many eminent engineers, both English and foreign, and the experimental illustration of many of the papers, rendered possible by the meeting being held in a well-equipped engineering theatre, will add interest to the proceedings. In Section H the paper by Dr. Hans Hildebrand, and the description of the Glastonbury marsh village by Mr. Bulleid, with the discussions which they will undoubtedly give rise to, would, if they stood alone, constitute a tempting programme to anthropologists.

The efforts put forth in the town itself to make the gathering pleasant and successful will perhaps be best appreciated by reference to the local programme and maps now being issued to members. The townsmen have vindicated their character for hospitality by privately entertaining in their homes nearly 400 of their visitors. An ample list of hotels and lodgings, with a suitable map, has been issued for some weeks, some of the hotels binding themselves to a special tariff to members who engage their rooms through the local committee. The garden parties, excursions, and entertainments will be seen to have been so arranged as to leave no irksome leisure to be filled in by those who have done their duty to their Sections; and the scheme for privately engaging the Theatre Royal for the last Wednesday night will, it is hoped, justify by its success its boldness and originality.

With a programme of work of varied special and general interest and importance; with a universal desire on the part of the townsmen to do everything in their power to secure the comfort of their guests, and to afford pleasure and recreation to them; with the social element of the scientific gathering secured by the promise of attendance of men of science from all parts of our own country and from abroad; and, above all, with the promise of fine autumnal weather in a healthy, picturesque, and accessible town with most interesting surroundings,