

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

BY E. O. HOVEY.

The fiftieth meeting of the American Association for the Advancement of Science was held in Denver, Colorado, from the 24th to the 31st of August, under the presidency of Prof. Charles S. Minot, of Harvard University.

The meeting was well attended locally and regularly, and about 220 papers having a high order of merit were presented, some of which were of the greatest scientific interest and importance. Three hundred and five members and fellows were registered as being in attendance, besides the members of the nine affiliated societies which convened at the same time who were not members of the association, 92 of the number coming from the Atlantic States, 11 from the Pacific, and 6 from foreign countries. Fifty new members were elected, and 186 members were promoted to fellowship.

The chief interest of a convention is centered about the address of the retiring president, and it was with close attention that a large audience listened to Prof. R. S. Woodward, of Columbia University, who chose as his theme, "The Progress of Science," which will be found in full in the SCIENTIFIC AMERICAN SUPPLEMENT No. 1341. It is of unusual interest and importance.

The retiring vice-president of the section of anthropology, Amos W. Butler, State Superintendent of Charities of Indiana, chose as the subject of the annual address, "A Notable Factor in Social Degeneration," and discussed at length the effect upon the community of the presence in it of persons of feeble mind.

"The census of 1890 showed that there were more than 95,000 feeble-minded persons in the United States, but that they were not present in any uniform proportion in the various states. Whatever the proportion, such persons are a disturbing element in our social economy, and their life is a degenerating social force. Some of the children with stronger mental powers enter the public schools. They may make some progress for a time, but, whether they do or not, they must soon drop behind because they are unable to keep up with the work. Others roam the streets; the boys become the butt of the neighborhood, they are led into pranks, too often into vices, and seem to possess a peculiar tendency for immorality. The girls, many of them strong, well-appearing, with no one to teach them right and without strength of mind to protect themselves against the temptations which surround them, too early and too often fall into vice. These defectives usually become dependents for a part of, if not all the time. They may depend upon private charities, or, when possible, upon the overseer of the poor. They frequently live in the poorest quarters of our towns and cities, amid squalor and dirt, or occupy miserable huts in the least desirable localities of rural communities. It is not unusual for two or more families to live near each other or associate together. Marital ties are often lightly regarded. Frequently such bonds have not been entered into."

Prof. Butler cited statistics and related the history of many families of feeble-minded persons to show the effect which has been produced by our faulty manner of treating this unfortunate class of individuals, summing up his conclusions as follows:

"At last it became recognized that those who had given years of study to the idiot had a right to have an opinion and to express it. Then it came to be believed and advocated that in this class of defectives were many who were amenable to instruction, if it were only of the right kind and taught in the right way. The children might be reached and helped.

"First, it was thought many of these children could be educated to make their own way in the world. Finally, it was decided that while many of them could be taught to be self-supporting under direction, but very few could ever safely leave the fostering care of the institution. Children they are and children, mentally, they will be as long as they live.

"More and more came the conviction that there should be custodial institutions. These were especially advocated for feeble-minded women under 45 years of age. In such institutions they would be safe and with no prospect of reproducing their kind. Now it has come to be regarded as the proper right and duty to retain control over these grown-up children during life. Some states have made a beginning for this purpose. Never have we appreciated as strongly as we do to-day the untold misery and accumulating expense caused by the lack of control of our feeble-minded population. Their fecundity and animal instincts make them fit subjects for consideration, both on financial and moral grounds, to say nothing of the dangers that beset those of strong minds who have weaker bodies. The problem presented to us is the manner in which these conditions shall be met. Its solution lies in an intelligent and general knowledge of the subject by the public, preventive measures by legal marriage restrictions and other means, the edu-

cation of feeble-minded children and the custodial care of feeble-minded women."

The cliff dwellers received a large share of the time of the anthropologists on account of the proximity of the ruins and the local interest in the subject. Mrs. John Hays Hammond, of Denver, gave an illustrated lecture upon some of these ruins, and Dr. J. W. Fewkes, of Washington, discussed the problem of their origin, and stated that the race which built them was not extinct. Prof. G. G. MacCurdy, of Yale University, reported for a committee that had been appointed to investigate the teaching of anthropology in the United States that it had been learned that there were thirty-one institutions in which the science was taught in some form. Dr. W. J. McGee, in a paper on "Current Questions in Anthropology," stated that the human race must have sprung from as many original pairs as there are or have been distinct races. By means of lantern slides from direct negatives, Dr. Fewkes described to the section and the public the snake dance recently held by the Moqui Indians for the purpose of inducing rain by placating the angered spirits of the air. At the request of this section the general association passed resolutions strongly indorsing the present movement to make national reservations of the chief areas of cliff dwellings, and urging upon Congress the early adoption of the necessary legislation.

Prof. C. M. Woodward, of St. Louis, in his address as retiring vice-president of the Section of Social and Economic Science, discussed the "Change of Front in Education," which took place during the past century, saying, in part, that "from the days of John Milton, in 1608, to the end of the eighteenth century, university training culminated in a preparation for the professions of law, medicine and theology, and in the training of the nobility for the duties and responsibilities of government and elegant society. But when alchemy developed into chemistry; when physics became an experimental science; when Leibnitz and Newton elaborated the infinitesimal calculus; when Watt invented an efficient steam engine; when Fulton built a successful steamboat; when Stephenson devised the locomotive and constructed a road with smooth rails; and finally, when Siemens and Gramme produced the electric motor, vast fields of fascinating and useful material were opened for study and research. Mathematical analysis and the principles of mechanics, which had previously been devoted to the problems of physical astronomy, were now directed to the study of the transformation and transmission of energy, the theory of structures, and the phenomena of electricity. The theory of evolution gave a new meaning to all vital phenomena; and the doctrine of the conservation of energy permeated all study of motion and force. Out of this vast extension of the horizon of human activity and a corresponding multiplication of occupations has come an imperative demand for more education and for technically educated men. In our industrial system the crying want has been and is for men who can both plan and execute. The secret of our unparalleled commercial and industrial success lies in the fact that we have put educated brains into our work. Hence a score of professions unthought of one hundred years ago have been called into being, and the standards of these new professions are of the highest order. And a university, instead of being 'a place where nothing useful is taught,' may now be defined as a place where everything useful in a high and broad sense may be taught."

Prof. C. R. Van Hise, of Wisconsin University, was designated by the association to give the public lecture in compliment to the citizens of Denver. He took as his subject "A Study of Ore Deposits," and gave the results of the years of investigation which he has devoted to the question of the alteration of rocks, as far as they apply to the deposits of the ores of metals. Prof. Van Hise believes that the greater number of ore deposits which contribute to the wealth of the world are the work of underground water; that is, that the solutions which permeate the rocks everywhere for a considerable depth below the surface are taking material in solution in one region and depositing material from solution in another, and that the material thus deposited in certain places is sufficiently abundant to make an ore deposit. The next fundamental principle is that the ores are derived from the outer crust of the earth. The strongest rocks are limited in their crushing strength, and at a certain depth below the surface of the earth the pressure will be enough to overcome this strength, if there is any opportunity for movement. Therefore, openings of great size cannot be assumed to exist below this depth, and it follows that veins cannot increase indefinitely in size and richness of metallic content as they descend. It has been determined by calculation, furthermore, that the extremely small percentage of metallic materials in the outer crust is enough in aggregate to account for all the deposits which have been or are likely to be mined. The third important principle is that the circulation of the underground water is due to the action of gravity on portions having different temperatures. Prof. Van Hise illustrated his points

by the use of lantern slides and then proposed a new classification of ore deposits: First, those concentrated by ascending waters alone; second, those concentrated by descending waters alone; third, those concentrated first by ascending waters and then reconcentrated by descending waters.

Prof. T. C. Chamberlin, of Chicago University, in delivering what he modestly called a "Report on Some Studies Relative to Primal Questions in Geology," gave the Section of Geology and Geography the results of many years of patient investigation into some of the most abstruse problems of the science. He has found that the nebular hypothesis of Laplace and others cannot stand against the arguments arising from the mathematical consideration of the laws of mass and momentum and Prof. Chamberlin proposes to substitute for it the supposition that the nebula from which the solar system has been derived was disrupted by passing in its orbit close enough to a solid body to cause an explosion in the former. The fragments received a spiral or vortical motion, and may have thus formed the planets. This line of investigation indicates that the earth has been formed by the slow aggregation of attenuated matter with resulting comparatively low temperatures. If this hypothesis be correct, the earth is a solid spheroid, and most of the geological theories must be revised. The influence of these masterly investigations by Profs. Chamberlin and Moulton will be felt far beyond the domains of geology.

T. A. Rickard, of Denver, struck a popular chord in his earnest "Plea for Greater Simplicity in the Language of Science," which he gave before the geologists, but his paper could be read with great profit and his suggestions followed to advantage by many others besides scientists. He deprecated particularly the loose use of unusual words and of long, technical terms derived from Latin and Greek, when short Anglo-Saxon words could be used for expressing the same ideas. The author cited many striking examples of the harmfulness of this kind of pedantic language which obscures truth and falseness alike, to the degradation of science and the total confusion of those of the unlearned who are searching after information.

A new section, the tenth of the association, was organized at this meeting for the study of physiology and experimental medicine under the leadership of Prof. Cattell, of Columbia University.

The social features of such a convention were by no means neglected, and the association expressed its appreciation of the hospitality of the citizens of Denver, Boulder and Colorado Springs, which made this meeting memorable. The president for the ensuing year is Prof. Asaph Hall, of Harvard University, the celebrated astronomer, and the annual meeting is to be held in Pittsburg, Pa., from June 28 to July 3. The following year the experiment is to be tried of holding the meeting of the association during the first week of January, in Washington, D. C.

THE BEST CLASS TRADE PAPER.

Our esteemed contemporary, Printer's Ink, has recently established a competition to determine which is the best class Trade Paper. The competition has now been running for several issues, and we note that in its issue of September 4 the SCIENTIFIC AMERICAN is mentioned as having been dropped from further consideration on the ground that it cannot be called strictly a Trade Paper and therefore is not eligible to the competition. Our contemporary says:

"Among the papers dropped from further consideration is the SCIENTIFIC AMERICAN, without doubt the strongest and most influential of them all. It is the only one to which the American Newspaper Directory has heretofore awarded the mark of excellence generally spoken of as the bull's-eye (● ●), the meaning of which is explained in the following paragraph:

"(● ●) Advertisers value this paper more for the class and quality of its circulation than for the mere number of copies printed. Among the old chemists gold was symbolically represented by the sign ●.—Webster's Dictionary."

"The SCIENTIFIC AMERICAN, however, never lets its circulation be known and is perhaps a paper of too much general interest to be properly denominated a class paper. Certainly it cannot be called a trade paper. Were the Sugar Bowl to be awarded to the SCIENTIFIC AMERICAN, it might, perhaps, be afterward claimed that the agricultural papers should have had consideration in this connection. In fact, it becomes apparent that the intention of the award is really not the best class paper, but the best trade paper. On this ground, if no other, the SCIENTIFIC AMERICAN is omitted from further consideration."

Under the patronage of the King of Belgium, a French-Belgian syndicate is being formed, it is reported, to build an electric express line for passengers and light freight between Paris and Brussels and from the latter place to Antwerp. The trip from Paris to Brussels is expected to be made in one and a half hours, and from Brussels to Antwerp in ten minutes.