

SCIENTIFIC PAPERS IN THE SMITHSONIAN REPORT FOR 1912.

THE annual report of the Board of Regents of the Smithsonian Institution for the year 1912 has now been issued by the Government Printing Office in Washington. It provides full particulars of the varied activities, the expenditure, and the general condition of the Institution for the year ending June 30, 1912. But, as usual, the most attractive part of the volume, which runs to 780 pages, is the general appendix of 650 pages of contributions by scientific workers of many nationalities. These papers are sometimes translations of important contributions to scientific periodicals in different parts of the world, sometimes lectures or addresses of note, and in other cases original articles.

Among the numerous translations may be mentioned those of Prof. P. Puiseux's article in the *Revue générale des Sciences* of June 30, 1912, on the year's progress in astronomy, and that in the *Revue Scientifique* for April 6, 1912, on spiral nebulae. Another translation is of an article by Mr. C. V. Boys on experiments with soap bubbles. The original was published in the *Journal de Physique*, August, 1912, and was a lecture delivered before the French Physical Society in April of that year. From the *Revue générale des Sciences*, November 30, 1912, is taken also Prof. Emile Borel's address on molecular theories and mathematics, which was delivered on the occasion of the inauguration of the Rice Institute at Houston, Texas. This is followed by an essay by the late Henri Poincaré on the connection between æther and matter, an address delivered before the French Physical Society on April 11, 1912, and printed in the *Journal de Physique*, May, 1912. It may be remarked here that at the end of the volume there is an interesting biography of Henri Poincaré, his scientific work, and his philosophy, written by Dr. Charles Nordmann. From the *Journal de Physique*, June, 1911, is taken also Sir William Ramsay's address to the French Physical Society on the measurement of infinitesimal quantities of substances, in which he details some of the recent efforts of men of science "to see the invisible, to touch the intangible, and to weigh the imponderable." Prof. L. Lecornu's "Review of Applied Mechanics" is taken from the *Revue générale des Sciences* of July 30, 1912; M. A. Lacroix's essay on "A Trip to Madagascar, the Country of Beryls," is from *La Géographie*, November 15, 1912; and that by M. R. Legendre on the survival of organs and the "culture" of living tissues is from *La Nature*, November 2, 1912, where he cites remarkable experiments the results of which have proved that organs and living tissues may be preserved for some time "in cold storage," and then transplanted or grafted to the living bodies of other individuals of the same species. An essay on adaptation and inheritance in the light of modern experimental investigation, by Herr Paul Kammerer, is from *Himmel und Erde*, June, 1911. Dr. L. Gain's account of the penguins of the Antarctic regions is from *La Nature*, July 6, 1912.

Prof. Zaborowski's paper on ancient Greece and its slave population is translated from the *Revue Anthropologique*. From it one is enabled to obtain a good idea of the social and economic conditions which prevailed in ancient Greece during the height of the slave traffic, which was instrumental in effecting a decline in the efficiency and productiveness of her citizens. Slaves were employed at such low rates and were secured in so many ways, that everyone owned at least one or two, who were made to perform all the household and industrial work, leaving the citizen

owners to spend their time in idleness and luxury. The prevailing economic conditions and customs tended to lower the moral of families, and reduce their numbers. Enriched by slave labour, and entertained by the doings of men and women purchased from abroad, the Greeks became spectators of life and practically renounced the raising of children.

Among notable addresses included in the appendix Prof. Schäfer's presidential address to the Dundee meeting of the British Association takes a prominent place. Prof. G. Elliot Smith's presidential address to the Anthropological Section at Dundee on the evolution of man appropriately follows Dr. Schäfer's. Dr. Edward Sapir's lecture at the University of Pennsylvania on the history and varieties of human speech is reprinted from the *Popular Science Monthly*, July, 1911. Prof. H. T. Barnes's Royal Institution lecture on icebergs and their location in navigation is given in full.

Many original contributions are also included. Prof. W. J. Humphreys, professor of meteorological physics in the United States Weather Bureau, contributes an article which will be of interest and of practical value to aviators and students of mechanical flight. It is entitled "Holes in the Air," which means the various places in the atmosphere where the conditions, so far as flying is concerned, very much resemble actual vacuities. The author explains the nature of the nine known types of atmospheric conditions, which he groups under two heads: the vertical group and the horizontal group. After carefully covering the dangers resulting from such atmospheric conditions, Prof. Humphreys concludes his article with the following note:—

"All the above sources of danger, whether near the surface, like the breakers, the torrents, and the eddies, or well up, like the billows and the wind sheets, are less and less effective as the speed of the aeroplane is increased. But this does not mean that the swiftest machine necessarily is the safest; there are numerous other factors to be considered, and the problem of minimum danger or maximum safety, if the aeronaut insists, can only be solved by a proper combination of theory and practice, of sound reasoning and intelligent experimentation."

Mr. F. B. Taylor, of the U.S. Geological Survey, contributes an essay on the glacial and post-glacial lakes of the Great Lake Region, and Mr. A. H. Brooks, of the same service, one on applied geology.

Mention must be made of the articles reprinted from English periodicals, among which we notice Prof. Armstrong's "Origin of Life: A Chemist's Fantasy," which appeared in *Science Progress*, October, 1912.

As usual, the illustrations are numerous and excellent.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

LORD RAYLEIGH will unveil a tablet to the memory of Lord Lister at King's College, London, on Wednesday, January 14, at 4.30. The ceremony will be followed by the inaugural lecture of the newly appointed professor of physics, Prof. O. W. Richardson, F.R.S., who will take as his subject, "The Discharge of Electricity from Hot Bodies."

DR. GEORGE SENTER, reader in chemistry in the University of London, and lecturer in chemistry at St. Mary's Medical School, has been appointed to the position of head of the department of chemistry at Birkbeck College, in succession to Dr. Alexander McKenzie, who was appointed recently to the chair of chemistry at University College, Dundee (University of St. Andrews).

A FUND of 100,000*l.*, which the Knights of Columbus of the United States have been collecting for more than two years for the Catholic University at Washington, has been completed. The gift, says *Science*, will be presented to the institution some time during the Christmas holidays. From the same source we learn that the board of regents of the University of California has announced the completion of the additional fund of 120,000*l.* for the erection of the hospital building which is to be a part of the college of medicine of the University.

THE late Right Hon. G. W. Palmer bequeathed 10,000*l.* to University College, Reading. We learn from the *Reading University College Review* for December that Mr. Alfred Palmer has suggested that this legacy should be devoted to building a university library, and on behalf of Mrs. G. W. Palmer, his sisters, and himself, has offered to supplement it to such extent as will be necessary to enable a suitable library to be built on the site reserved for the purpose, and also to provide an endowment fund for maintenance. The library would thus become a memorial to Mr. G. W. Palmer. The council of the college has approved the proposal gratefully.

THE Eugenics Education Society is organising a course of instruction on the groundwork of eugenics which will be given during the spring and summer of 1914. Dr. L. Doncaster will deliver eight lectures on evolution and heredity at the Imperial College of Science, South Kensington, on Fridays, at 5.30 p.m., beginning January 23, and Dr. M. Greenwood, Jun., will give instruction in statistical methods as applied to problems in eugenics, at the Lister Institute, Chelsea Bridge Road, S.W., on Fridays at 5.30 p.m., beginning May 1. Dr. Doncaster will discuss the general evidence for evolution and the more important theories of evolution, variation, and mutation, theories of heredity, old and new, the relation between heredity and sex, and the facts of heredity in man, together with the bearing of all these things on human improvement. Dr. Greenwood will give an outline of statistical work and theories bearing on heredity, and will explain the principal statistical constants, such as means, standard deviations, and coefficients of correlation. Their calculation will be illustrated on suitable data. The fee for the combined courses will be one guinea, to be paid in advance to the hon. secretary, Eugenics Education Society, Kingsway House, Kingsway, W.C., to whom all inquiries should be addressed.

THE report of the work of the department of technology of the City and Guilds of London Institute for the session 1912-13 has now been published by Mr. John Murray. At the recent examinations 21,878 candidates were presented in technology from 448 centres in the United Kingdom, and of these 13,618 passed. By including 812 candidates from India, from the overseas Dominions, and from other parts of the British Empire, and all candidates for special examinations, the total number examined was 25,339. During the session ninety-one centres were visited by the institute's inspectors, several centres receiving two or three visits in order to complete the inspection. It is satisfactory to find the report stating that there can be no doubt that the teaching of technology has greatly improved during the past few years; but it is noted that the examiners have still to direct attention to the insufficient knowledge that some candidates possess of the principles of their subjects, and to the lack of practical knowledge shown by others. The inability of candidates to express themselves clearly is, the report says, perhaps not so noticeable as in past years, but in no fewer than

ten subjects the examiners have to direct attention to the difficulty that simple arithmetical calculations present to many candidates—a defect which can only be attributed to insufficient preliminary training.

THE December number of *The Popular Science Monthly* contains an article on the place of study in the college curriculum, by Dr. P. H. Churchman, of Clark University. In it he points out that a renaissance of the old belief in the value of strenuous intellectual work for the young man of eighteen to twenty-two seems to be coming, and that the older universities of the United States are beginning to weed out the incompetents who for several generations have used them as social clubs. For a time this step will mean a decrease in numbers, and to those who only look at the surface of things numbers mean success. The idea that it is not necessary to insist that all those in residence at a college should be real students is called "Oxonian" by the author, and he admits that it has the advantage over the Continental idea of much learning and nothing else. He values highly all those college institutions of a non-intellectual type which contribute to the production of the "college-bred man," but he points out that the college loafer who is up for social reasons avoids strenuous effort even of the non-intellectual kind. He has no confidence in the annual or semi-annual college examinations as a means of discrimination between the idler and the earnest student, and reminds his readers of well-known candidates at Princeton who, after idling away the session, obtained respectively a first class in psychology after two hours' grind at some printed notes and a second class in zoology after five hours' coaching. No examination of the usual type has ever been invented which cannot be circumvented by the aid of an intelligent crammer. He advocates the less formal monthly examination or the better plan of imposing examination tests at any moment without warning and frequently. Such examinations afford the best test of that gradual growth of intellectual power which comes from steady and sustained effort over a long period, and from intercourse and discussion with superiors and colleagues developing along the same or similar lines.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 11.—Sir William Crookes, O.M., president, in the chair.—A. Mallock: Intermittent vision. When a wheel turns so rapidly that the separate spokes cannot be seen or easily followed by the eye, and if at the same time the observer receives a small mechanical shock of almost any kind, the spokes appear almost stationary for a fraction of a second. The appearances depend on the speed of rotation, on the brightness of the illumination, and, to a lesser degree, on the nature of the shock. Suitable shocks are given by the contact of the feet with the ground, as in walking, by tapping the head or body, and in many other ways. Experiments are described bearing on the relation between the appearances and the speed of rotation, and an explanation is suggested depending on an assumed variation of sensibility produced by a slight shock. This variation, which it appears is rapidly extinguished, has a periodic time of about $1/18$ second, but this differs slightly for different individuals.—Prof. R. J. Strutt: Attempts to observe the production of neon or helium by electric discharge. The present experiments were begun in the hope of confirming the work of Collie and Patterson (*Trans. Chem. Soc.*, 1913, vol. ciii., p. 419, and *Proc. Chem. Soc.*, 1913, vol. xxix., p. 217). The results have been negative, whether from a failure to