pany, the du Pont Company, and many others), as to fundamental research in pure science.

The last year has afforded a striking instance of this —the only one I have time to mention. The National Academy of Sciences, a sister organization of this association, realizing that America, in proportion to its wealth and population, is not contributing anything like its share to the advancement of science, and believing that this is largely due to very inadequate financial support of the investigators of this country, undertook to secure from our larger corporations a fund of $20,000,000 for the promotion of research in all the varied branches of pure science. It was clearly seen that the first step in such a campaign must be to get the aid of prominent men of affairs, whose support would carry weight with our industrial leaders. The first remarkable thing was that there was no difficulty whatever in securing this support. Herbert Hoover, in spite of his many obligations, accepted the chairmanship of the board of trustees of the fund; and such men as Elihu Root, Charles Hughes, Andrew Mellon, Owen Young, John W. Davis, Edward House, J. J. Carty, and Gano Dunn became members of the board and have for the most part taken an active part in its work. The second remarkable thing was that there was no need of convincing either these men or the leaders of industry consulted that the fund should be used for research in science itself rather than in its industrial applications. They saw that the latter was a field of research that should be prosecuted by the industries themselves within their own establishments—not by universities or endowed research institutions. They realized too, as Professor Tyndall said in substance fifty years ago in his lectures in New York, that "just as the stream dwindles when the fount dries, so surely will technical developments lose all vitality when they cease to be nourished by new scientific discoveries." Scientific discovery "puts not only money into the pockets of individuals, but millions into the exchequers of nations," yet even greater are its intellectual and spiritual contributions to the welfare of mankind.

Well, the campaign was undertaken under these favorable auspices, and is now progressing satisfactorily. Already a considerable sum payable through a period of ten years has been secured, and the prospects are good for more.

But it is not alone on the financial side that science needs the support of the intelligent people of any community. While *science* has through daily experience come to be universally recognized as vitally important, yet it is often not realized that science does not "just grow"—that it arises from *research*, and that research is a sensitive plant which will grow successfully only from carefully selected seeds—the best brains of the nation; and which must be protected against the frost of dogmatic intolerance, against the drought of administrative routine, against the flood of modern mass education, against overforcing through the impatient demands of practical men, and against the blights of poverty and social neglect. Research will come to its own in any community only when its members, in the words of Pasteur, regard their research laboratories as their temples.

THE NEWLY-ELECTED PRESIDENT OF THE AMERICAN ASSOCIATION

ALL who are interested in the advancement of science in America and in the world at large must be deeply gratified by the election of Henry Fairfield Osborn as president of the American Association for the Advancement of Science. This is the highest honor that can come to an American worker in science from his colleagues, and Professor Osborn's work is surely an excellent example of the finest endeavor for which the American Association stands. Primarily a vertebrate paleontologist his influence for advancement has been much broader than that field. His work has been remarkably effective in many lines of scientific thought. He is well known as a research worker, author, educator and administrator.

The president-elect was born at Fairfield, Connecticut, on August 8, 1857, the son of William Henry and Virginia Reed (Sturges) Osborn. On the paternal side he is descended from the Osborns of Salem, Massachusetts, of the colonial period. On the maternal side his descent is from Nathan Gold and Andrew Ward, of the time of the Revolution, and from Rev. Ebenezer Pemberton, one of the three founders of Princeton College. His maternal grandfather was Jonathan Sturges, who was president of the New York Chamber of Commerce. His father was a founder and for many years president of the Illinois Central Railroad.

Educated at the Columbia Grammar School and Lyons Collegiate Institute, of New York City, and at Princeton College, Osborn received the A.B. degree in 1880. He was greatly influenced by President McCosh in philosophy and by Professor Arnold Guyot in geology. His field work in paleontology began immediately after graduation, for he took part in geological expeditions to Colorado and Wyoming in 1877 and 1878. In 1878–79 he took courses in anatomy and histology at the College of Physicians and Surgeons and at Bellevue Medical College, in New York City. In the year 1879–80 he studied embryology at Cambridge University, under Francis Balfour, and comparative anatomy in London, under Thomas Henry Huxley. He also spent some time in Germany. Having held the first E. M. Biological

Fellowship at Princeton for the years 1880–83, he was appointed assistant professor of natural science at that institution in 1881, and professor of comparative anatomy in 1883, where he remained seven years.

Professor Osborn was called to Columbia University in 1890 to the Da Costa chair of biology. Here he organized the zoological department, instituted scientific expeditions and started the Columbia Biological Series of publications, which he edited for a number of years. In 1894 he served on the administrative board of publications and as a trustee of Columbia University Press. From 1892 to 1895 he was dean of the faculty of Pure Science at Columbia University. He retired from active teaching in 1910, but since then has remained in Columbia as research professor of zoology.

The new president's career in university work has been amply adequate for very great eminence, but he has also won the position of dean of American museum organizers and administrators. Throughout the last nine years of his Columbia period he served as curator of the department of vertebrate paleontology in the American Museum of Natural History, New York City. In the last named year he withdrew from the active curatorship and he has since then been honorary curator. To research, writing, editing and the administration of the museum he has devoted the last thirty-seven years. He was assistant to the president from 1899 to 1901 (when he inaugurated the present internal organization of the museum and started the museum journal and the memoir series of publications), trustee and vice-president from 1901 to 1908, and he has been president of the Board of Trustees since the death of President Jesup in 1908.

As curator in vertebrate paleontology, President Osborn led in the organization of many expeditions that went out from the American Museum in search of vertebrate fossils, largely to the regions made famous by the pioneer work of Leidy, Cope and Marsh. He was a member of the exploration parties of 1893, 1897, 1903, 1906, 1907, 1908, 1909 and 1910 and he has also accompanied some expeditions of later years. In 1907 the expedition to the Fayûm, in Egypt, secured, among many other valuable finds, fossils representing two very early stages in the evolution of the elephant and led to the Memoir on the Proboscidea now in press. His earlier prediction that Africa is to be considered as the original homeland of this great mammal appears to have been fully confirmed.

During the administration of President Osborn have occurred remarkable advances in paleontological technique at the American Museum of Natural History, and great improvements in the teaching value of the exhibits, through attractive grouping and posing. In his museum period has been assembled what is said to be the most extensive collection of vertebrate fossils in existence, notably the collections of fossil horses and of fossil proboscideans representing geological times from the Tertiary forward. These fossil collections have become a standard of excellence. The president has continually encouraged and stimulated research and the distribution of knowledge of natural history in the City of New York. His many and important contributions to public education were the reason for his receiving the Roosevelt Medal of Honor, presented by President Harding in 1923.

Professor Osborn has also a fine record of research achievement in the U. S. Geological Survey, to which he was appointed, as vertebrate paleontologist, in 1900. He was promoted to the rank of senior geologist in 1924. In this connection he is bringing out his greatest research contribution, a monograph on "The Titanotheres of Ancient Wyoming, Dakota and Nebraska," which is now in press.

As chairman of the executive committee of the New York Zoological Society (1896–1903, 1907–1909), Dr. Osborn organized and established the administrative and scientific work of the society and supervised details of the plans for the splendid facilities of the New York Zoological Park. He was vice-president of the Zoological Society in 1897 and president from 1909 to 1923. As a mark of its appreciation of his long-continued interest and devotion, the New York Zoological Society has elected him to honorary presidency for life.

In 1906 Professor Osborn was elected to the secretaryship of the Smithsonian Institution, held to be the most honored scientific post in the United States, but he was obliged to decline. He has held the presidency and other responsible offices in many American scientific and educational organizations. He is a member of the National Academy of Sciences and the American Philosophical Society and an associate fellow of the American Academy of Arts and Sciences. His name is on the rolls of a very large number of learned organizations, both American and foreign. He has received many medals of honor and numerous honorary degrees.

The president-elect became a member of the American Association for the Advancement of Science in 1881, being elected to fellowship in 1883. He became a life member in 1917. He is shown, on the cards of the Washington office, as specially interested in Sections E (Geology and Geography), and F (Zoological Sciences). He was vice-president (for Section E) in 1892 and has served the association in various other capacities from time to time. His scientific record and his leading position in affairs that interest scientific workers make Professor Osborn an excellent

choice to represent the work and ideals of the American Association.

Professor Osborn's publications are many and in many fields. According to available information he has published seven scientific memoirs, eleven books and over seven hundred papers. He edited "A Naturalist in the Bahamas" (1910), a memorial to Dr. John I. Northrup, and "Fifty Years of Princeton, '77" (1927). The following are the titles of his books: "From the Greeks to Darwin" (1894), "Evolution of Mammalian Molar Teeth" (1907), "The Age of Mammals" (1910), "Huxley and Education" (1910), "Men of the Old Stone Age" (1915), "Origin and Evolution of Life" (1917), "Impressions of Great Naturalists" (1924), "The Earth Speaks to Bryan" (1925), "Evolution and Religion in Education" (1926), "Creative Education in School, College, University and Museum" (1927), "Man Rises to Parnassus" (1927). A survey of his published papers shows 14 on geology, 35 on zoology, 24 on comparative anatomy, 3 on eugenics, 30 on anthropology, 77 on evolution, 285 on paleontology, 52 on education, 5 on psychology, 80 on biographic subjects, 52 on administrative subjects and 36 in other fields.—B. E. L.

REPORTS OF THE SESSIONS OF SECTIONS AND SOCIETIES AT THE SECOND NASHVILLE MEETING

THE general reports of the second Nashville meeting have been published in SCIENCE for January 27. The present issue is mainly devoted to special reports of the sessions of the several sections and of the societies that took part in that meeting. Almost all reports from section or society secretaries were in hand by January 14. These have been edited and assembled for the following pages.

The permanent secretary is very grateful to the secretaries of the sections and societies for their hearty cooperation in this work, especially for the promptness with which the reports have been received this year. The material here presented is classified according to the sections of the association, after the manner of the arrangement of the general program of the meeting. It is to be noted that the days of the week mentioned are those from Monday, December 26, to Saturday, December 31, 1927.

SECTION A (MATHEMATICS)

Vice-president and chairman, R. C. Archibald; *retiring vice-president,* Dunham Jackson; *secretary,* C. N. Moore, University of Cincinnati, Cincinnati, Ohio. With the section met the American Mathematical Society (*president,* Virgil Snyder; *secretary,* R. G. D. Richardson, Brown University, Providence, R. I.) and the Mathematical Association of America (*president,* W. B. Ford; *secretary,* W. D. Cairns, Oberlin, Ohio).

(Report from R. C. Archibald)

Section A held a joint session Thursday afternoon with the two affiliated organizations. Professors Jackson and Ford presided, and three papers were presented: the first by Professor E. V. Huntington, of Harvard University, retiring chairman of the section; the second by Professor Dunham Jackson, retiring president of the Mathematical Association of America, and the third by Professor Arnold Dresden, of Swarthmore College, representing the American Mathematical Society.—Professor Huntington gave a non-technical account of "The Notion of Probable Error in Elementary Statistics." This address was published in SCIENCE for December 30, 1927.

Professor Jackson spoke on "The Human Significance of Mathematics." It was contended that the significance of advanced mathematical study in human society is more profound than an analysis of the immediate applicability of current research would indicate. Mathematics is of great benefit in promoting the habit of exact thinking, in some at any rate, of those who have experience of it. The universality and permanence of mathematical truth make a profound appeal to the constructive imagination and constitute a bond of common experience between thinking men of all times and places. Since mathematical knowledge as we possess it is a product of human thinking, the process of acquiring it contributes materially to the comprehension of the manner of working of the human intelligence and of the extent to which reliance can be placed on the results of its free play. And since our knowledge comes only in restricted measure from the discoveries of the great leaders in the science, and very largely from the collective experience of the race, every serious student, whether personally engaged in research or not, may feel that he contributes something to the completeness of the structure. This paper is to be published in *The American Mathematical Monthly.*

Professor Dresden's paper dealt with "Some Philosophic Aspects of Mathematics." Discussions of the foundations of mathematics occasioned by recent work of Brouwer, Hilbert and others led to the consideration of certain questions which bear on the essential character of the subject; *viz.,* the meaning of "existence" in mathematics, and the basis for confidence in the validity of its conclusions. In its essential aspects, mathematics has no strictly objective basis, but is, in a very definite sense, subjective and temporal; belief in the validity of mathematical conclusions rests upon respected successful verifications made in the applications of mathematics.