new president was planning to make changes in administration which would reduce the office back to its earlier status, that it would take only a few hours a week and that he felt it his duty to make this relatively small sacrifice to aid his new president with many of whose ideas and ambitions he was himself in whole-hearted agreement. For four years he labored and undoubtedly sacrificed much more in time and strength than he had expected. The office was not returned to its earlier status; Birkhoff was succeeded by a practically full-time dean and two, perhaps half-time, assistant deans. In matters social it seems often to eventuate that the effort to displace a system in one direction results in the system executing a displacement in the contrary direction.[3]

When George Birkhoff was starting out as a mathematician the first strong group of pure mathematicians which we have had in this country was supplanting, and even trying to suppress, the applied mathematicians who had dominated American mathematics. No doubt it was high time that modern pure mathematics was given more attention in the United States. When Birkhoff came to Harvard from Princeton in 1912 he came as an analyst. I remember some of the sharp discussions and violent differences of opinion among the Harvard mathematical professors at the time. All rated him very high in analysis; some wanted him in Harvard for that reason alone, others thought Harvard already strong enough in that field and felt that it would be better to strengthen Harvard in some other branch of pure or applied mathematics. It is indeed a matter of inevitable disagreement whether a university department should be sharply specialized in some one main line of activity or be spread generally over several important lines.

As a matter of fact it would be hard to say whether in his thirty-two Harvard years, 1912–1944, Birkhoff was more the analyst or the applied mathematician; he returned to the great tradition. Of his four books —"Relativity and Modern Physics" (1923), "The Origin, Nature and Influence of Relativity" (1925), "Dynamical Systems" (1928), "Aesthetic Measure" (1933)—three certainly and perhaps all four would be classified as applied mathematics. Meanwhile he continued to publish contributions to pure mathematics in the leading mathematical journals of the world. At the time of his death he had in press in France a monograph on auto-equivalent functions and was publishing here upon his theory of gravitation.[4]

If I were to emphasize any personal trait of the Birkhoff I knew for forty years, it would be his keen esthetic sense. It was that which led him to write on esthetic measure, but it showed equally in his mathematics and in his daily life. He was an artist, a simple, generous, zestful artist. Everybody seemed to like him and those who conferred honors upon him seemed to take as great pleasure in giving as he in receiving. I shall not list his many honorary degrees and prizes but must mention that he was personally known and welcome not only in his own country but in Europe, in Asia and in Latin America.

EDWIN B. WILSON

HARVARD UNIVERSITY

[3] For an inanimate system regulated by thermodynamics or statistical mechanics—and the ergodic theorem—we have the principle of LeChatelier that every system in stable equilibrium experiences from the variation of any single one of the factors which maintain the equilibrium a transformation in a direction such as, if it occurred by itself, would bring about a variation of the factor in the opposite direction, *i.e.*, a variation of one of the factors which have to do with a stable or neutral equilibrium can not have as ultimate effect a change of which the direction is opposite to the infinitesimal change with which the disturbance starts. Indeed, some have maintained that this principle is really the definition of stable equilibrium and in essence goes back to Hippocrates. If we displace a body from a position of unstable equilibrium, it is considered as a definition of the instability that the body will persist of itself in moving further in that direction. The phenomenon which so often appears to take place in a social system in that the reaction reverses the displacement one has attempted to impose upon it would therefore seem, at least superficially, to be something different in kind from the phenomenon of deviations from equilibrium (stable, neutral or unstable) in inanimate systems. Possibly when the dynamics of biological and social change shall have advanced to an adequate state of development some future Birkhoff will find and prove some super-ergodic theorem that will be a basic bit of mathematics in the statistical mechanics of such systems.

RECENT DEATHS

DR. HENRY B. WARD, professor of zoology, emeritus, of the University of Illinois, died on November 30 at the age of eighty years.

DR. HANS FREDERIK BLICHFELDT, professor emeritus of mathematics of Stanford University, died on November 16 at the age of sixty-nine years.

JACOB DAVID TAMARKIN, professor of mathematics, who was on leave of absence from Brown University, died on November 18. He was fifty-seven years old.

DR. CHARLES A. VAN VELZER, emeritus professor of mathematics of Carthage College, from 1881 to

[4] See, Proc. Nat. Acad. Sci., Washington, vol. 30, Oct. 1944, pp. 324–334. Birkhoff replaced the curved space-time of Einstein by a flat space-time, using 4-vectors in place of tensors. If we regard physical theory as a convention adopted as a convenience in correlating the main facts of observation in some domain of science, we must admit that a change in any widely accepted theory may well be at first an inconvenience even though it prove in the long run to be a convenience because of its greater simplicity or because of its greater coverage of the facts. Thus only the future can determine the place that may be assigned to this latest, and unhappily last, of Birkhoff's contributions to science, but there are some of his pupils and friends who rate it very highly and will be active in pursuing its implications.

1906 professor of mathematics at the University of Wisconsin, died on November 19 at the age of ninety-four years.

THE death is announced at the age of sixty-six years of Dr. Clarence S. Yoakum, professor of personnel management, dean of the Graduate School and vice-president of the University of Michigan.

DR. LOUIS MAXWELL POTTS, research engineer of the Teletype Corporation, Chicago, died on October 23 at the age of sixty-nine years.

SCIENTIFIC EVENTS

ROYAL SOCIETY MEDALISTS

THE King of England has approved the recommendations made by the council of the Royal Society for the award of the two Royal Medals for the current year as follows:

To Professor J. D. Bernal, F.R.S., for his work on the structure of proteins and other substances by x-ray methods, and for the solution of many other problems requiring a physical approach.

To Dr. E. J. Salisbury, C.B.E., F.R.S., for his notable contributions to plant ecology and to the study of the British flora generally.

The following awards of medals have been made by the president and the council of the Royal Society:

The Copley Medal to Dr. O. T. Avery, For. Mem. R.S., for his success in introducing chemical methods in the study of immunity against infective diseases.

The Davy Medal to Professor Roger Adams, for his extensive researches in the field of organic chemistry and of his recent work in the alkaloid field.

The Hughes Medal to Professor B. F. J. Schonland, O.B.E., F.R.S., for his distinguished work on atmospheric electricity and of his other physical researches.

JOHN D. GRIFFITH DAVIES,
Assistant Secretary

THE PROMOTION OF SCIENCE BY THE GOVERNMENT

A SPECIAL meeting was called on Monday, November 19, by the Western Reserve University Chapter of the Society of Sigma Xi for consideration of the bills now before Congress on governmental promotion of science. The Case Chapter of Sigma Xi and the Cleveland Physics Society cooperated in the meeting, which was attended by seventy-five scientists of the Cleveland area. The program, under the chairmanship of Dr. Helen A. Hunscher, president of the Western Reserve Chapter, was as follows:

1. Summary of Vannevar Bush's Report to the President. H. S. Booth, professor of chemistry, Western Reserve University.
2. Discussion of the need for federal support of research and of the merits and dangers of the proposed bills. Discussion leaders:
   W. G. Leutner, president of Western Reserve University
   Webster G. Simon, educational vice-president of Western Reserve University
   Elmer Hutchisson, dean of the Case School of Applied Science
   Leonard O. Olsen, associate professor of physics of the Case School of Applied Science and president of the Cleveland Physics Society
   A. Sidney Harris, associate professor of physiology of Western Reserve University, chairman.
3. Recommendations of the Western Reserve Chapter Committee on Science Legislation.

The recommendations presented in part 3 of the program had already been sent under the signatures of the committee to President Truman, Senators Magnuson, Kilgore, Taft and Huffman, and to Mr. John Teeter, executive secretary for Senator Magnuson in organizing the hearings. These recommendations, as given below, were endorsed without dissent by those present at the meeting.

To the Senate Subcommittees which are conducting Hearings on Science Legislation

The undersigned members of the Committee on Science Legislation of the Western Reserve University Chapter of Sigma Xi submit the following statement of recommendations:

For reasons which have been ably stated by Dr. Vannevar Bush in his report to President Truman, "Science, the Endless Frontier," we strongly endorse the principle that a National Research Foundation for Federal promotion and support of scientific research be established.

After having studied the several bills for the establishment of a national organization or foundation, we recommend and urge that the bill which is finally reported to the Congress for adoption shall contain, among others, the following provisions.

1. That the powers of the foundation shall be vested in a board of nine members appointed by the President on the basis of a demonstrated capacity for the job and without regard for political affiliation. The director should be appointed by the board.
2. That researches shall be supported through contracts, grants or other forms of assistance. We oppose the principle that support shall be available to nonprofit institutions on a rigid contract basis only.
3. That the foundation, like other government agencies, be given the power to negotiate such patent arrangements with research contractors and grantees