

WILLIAM FOGG OSGOOD—IN MEMORIAM

With the death on July 22, 1943, of William Fogg Osgood, the American Mathematical Society has lost a beloved and distinguished member, and The Fraternity of Science a most faithful comrade.

William Fogg Osgood was born in Boston on March 10, 1864, the only child surviving beyond infancy of Dr. William Osgood, a physician and fourth in an unbroken line of that profession, and of Mary Rogers (Gannett) Osgood of Milton, Massachusetts. Both Osgoods and Gannetts were old New England families, the earliest American Osgood in the mathematician's line being John Osgood (1595–1651) who came to Ipswich, Massachusetts, in 1638 from Wherwell, near Andover (Hampshire), England, where the family's freehold seems to have antedated the Conquest. On the same side of the family, Osgood was a great great grandson of General Joseph Otis, the brother of James Otis the patriot.

Osgood attended the Boston Latin School, and entered Harvard in 1882, whence he graduated in 1886 *summa cum laude* with highest honors in mathematics and the second in a class numbering 286. In school his education had been centered in the classics, and at Harvard the study of the Greek authors formed a large part of his program; indeed he received second year honors in classics. But before long his interest in the experimental and mathematical sciences was aroused by his teachers at Harvard, most of all by his distant kinsman Benjamin Osgood Peirce; and his intention to devote his life to mathematics became established. After obtaining the A.M. in 1887, he received a travelling fellowship, and spent two years in Göttingen and a year at Erlangen where he obtained his Ph.D. (1890). He was awarded an L.L.D. by Clark University in 1909.

Osgood was married in 1890 to Therese Ruprecht (deceased) of Göttingen, and returned to become an instructor in the department of mathematics at Harvard (1890–93). He served there as assistant professor (1893–1903) and as professor (1903–33), and became professor emeritus in 1933. He was the father of three children: Dr. William Ruprecht Osgood of the Bureau of Standards, Mrs. Freda Osgood Silz (deceased), and Dr. Rudolph Osgood, a physician of Fall River, Massachusetts. In 1932 Osgood was married to Mrs. Céleste Phelps Morse. During 1934–36 he was visiting professor of mathematics at the National University of Peking. From 1936 until his death he lived in Belmont, Massachusetts.

Osgood was elected to the National Academy of Sciences in 1904. He was the eighth president of the American Mathematical Society

(1905–06). He was a member of the American Philosophical Society, the Deutsche Mathematiker-Vereinigung, the Leopoldinische-Carolinische Deutsche Akademie der Naturforscher, the Circolo Matematico de Palermo, corresponding member of the Mathematical Society of Charkow, the Göttinger Gesellschaft der Wissenschaften, and honorary member of the Calcutta Mathematical Society. He also belonged to Phi Beta Kappa and Sigma Xi.

We are fortunate in having an exhaustive bibliography of Osgood's works in the first volume of the Semicentennial Publications of this Society.¹ Moreover the original papers, numbering upward of four score, are too widely known and too technical to make more than their briefest mention desirable in this place. His study of term by term integration of non-uniformly convergent series (1896) contained in germ ideas of Borel measure. His example of a Jordan curve of positive area settled an important controversy. His work on conformal mapping is definitive. His treatment of the uniformization of algebraic functions formed an important contribution. Osgood initiated a branch of the calculus of variations. His work on the gyroscope showed how his mind could illuminate simple and important new aspects of a classical problem hitherto regarded as quite completed.

At the invitation of Felix Klein, Osgood wrote the article on the theory of functions of a complex variable in the *Encyklopädie der Mathematischen Wissenschaften*. Out of this grew his best known book, the *Lehrbuch der Funktionentheorie*. This book is a classic; it formed the first thorough and systematic treatment of the subject; it combines the deep impress of an individuality with the effective expression of a great mathematical tradition. The second volume deals with several complex variables and is today the only deep and broad systematization of the subject. It is a mine from which much material for future research will be drawn. So much of it is original that it has largely the import of a series of memoirs. During his last years, Osgood was working on the hypergeometric theory, which was intended to find a place in a later part of this book.²

In forming a picture of the mode and temper of Osgood's thought, three major influences should be regarded as having had a decisive effect in the formation of his mind: his predilection for physics, the early classical training, and the sojourn in Germany.

¹ R. C. Archibald, *A semicentennial history of the American Mathematical Society 1888–1938*, Amer. Math. Soc. Semicentennial Publications, vol. 1, New York, 1936, pp. 153–158.

² Circumstances have made it impossible as yet to ascertain how much has been left in a form suitable for publication.

Osgood once told me that he was at heart a physicist, and that if during his student days the career of physics had offered a more deeply mathematical and less disproportionately experimental form, he might well have made it his. And there was ever present in his mind the notion of mathematics finding one of its deepest justifications in serving as an instrument whereby the mind of man can penetrate into the mysteries of nature.

This is not to say that Osgood was any the less alive to that inner order which makes mathematics a fit subject of study in its own right. Not only did there appear to be nothing inconsistent between the two evaluations of the subject, but on the contrary he always saw the two—the extrinsic and the intrinsic justification of mathematics—as mutually reënforcing one another.

And this brings us to the second point. I have always felt that one of Osgood's most distinguishing characteristics was this sense of balance between values: applications and theory; traditional mathematics and innovations; teaching and research; and with it all the constant awareness that a mathematician is a human being who is using his human mind for his enlightenment, rather than a theorem-producing machine. And at the risk of being involved in a well known controversy, I hazard the opinion that this was due in no small degree to the fact that Osgood received his earliest intellectual impressions in the study of the classics. That sense of the dignity of reason, of tradition in excellence, and the instinct of historical continuity are qualities which are less to be derived from modern studies than from the writings of antiquity.

The third current of influence was the academic Germany of the eighteen-eighties, and especially the power of Felix Klein. The young Bostonian of four and twenty with his turn of mind at once scientific and classical came in Göttingen under the force of the great teacher whose ambition it was to unify mathematics and to set it forth in all its coördination and clarity. It is easy to realize the magnitude of the impression which was produced: the old scholar of the classics became the classical mathematician, and a flame was kindled which was to light a long career of science.

When Osgood and Bôcher returned from Germany to take positions on the Harvard faculty, they found the Department of Mathematics rather like that of a provincial college. It had contained individuals of eminence, but it could scarcely have supplied a real training in advanced modern mathematics. Then in a few decades it became one of the leading departments in the country, with a respectable place among the departments of mathematics in the world. This was

largely the natural result of the general movement of American education, and every member of the department at Harvard had his share in it. But if the credit of this rise to eminence can be given to any one man, Osgood was undoubtedly that one. His influence was exerted upon teaching at all levels, on the increased valuation of research, and perhaps most important of all, in making the many eminent appointments to the teaching staff—the only way in the long run in which any individual can assure the greatness of his department. Osgood was departmental chairman in 1918–22, and acting dean of the Graduate School in 1922 (February–July). He also belonged to various educational committees.

Osgood was one of the most notable teachers in American mathematics, and this at every grade from freshman to specialized graduate course. He was too true a democrat ever to allow himself to lower mathematics to the level of the student: it was his ambition on the contrary to raise the latter to the height of the subject. Ever speaking the language of the student, constantly mindful of his difficulties, Osgood spared no patient effort in bringing him to see what mathematics truly is: the powerful agent of illumination of the physical world, and the gem of human reason.

In his personal contacts with the students Osgood was a happy combination of the wise master and the cordial friend. This gentleman of the old school, whose charm and dignity made his acquaintance not only a pleasure but an honor, was so inclined to see the best in the men that he brought out their very best. Nor could it ever be ascertained whether a student's academic promise, or his being in trouble and in need of a friend constituted the greater claim to Osgood's kindness.

There are many with whom the memory of Osgood will dwell: With all those who have fallen heir to his intellectual heritage; and what state in the union fails to contain them? With his old students, to whom he brought the undistorted spirit of science; they must form by now a goodly host. With his contemporaries, whose ranks time has thinned, those companions in the task of bringing the Great Tradition to our shores. And also with some others, into whose lives he entered as a genial light and inspiration, beyond the power of language to convey.

BERNARD OSGOOD KOOPMAN