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## WILLIAM MCPHERSON

July 2, 1864—October 2, 1951

By WILLIAM LLOYD EVANS

Four miles southwest of Xenia, Ohio, at the end of a lane shaded by locust trees, stands the spacious farm-house where William McPherson was born on July 2nd, 1864. Regarding his ancestors, nothing is known that would have given an indication that he was to become an eminent teacher and a leader in academic circles.

His great grandparents emigrated from Scotland at about the time of the signing of the Declaration of Independence. The opening up of the so-called West animated his grandfather, John McPherson, to settle near Xenia, Ohio, at the time of his marriage to Margaret Hevling. Like all the hardy pioneers of that period, they traveled by covered wagon from the security of the East, in their case from Maryland, to set up a new home in the wilderness.

John McPherson began his career in Ohio as a chair-maker but later served also as the Postmaster and County Recorder. William's father, for whom he was named, worked for several years as an apprentice and journeyman saddle maker before turning to farming in 1840, when he married Mary Ann Rader. The tenth child born of this marriage, arriving just before their twenty-fifth anniversary, was William McPherson.

His mother loved flowers and successfully enlisted the interest of the entire family in the cultivation of her immaculate flower-beds. Gardening remained one of the chief hobbies of her young son, William. To this interest must be added his enthusiasm for the cultivation of fruits. He inherited from his father an unusual measure of kindness. He always enjoyed people and, in later years, one of his favorite activities was the regular Saturday visit to the market where he talked with many of his friends among the farmer salesmen.

The chronicle of his youth is a fore-shadowing of much of his later character and achievement.

Farm life was rigorous and there were daily chores both summer and winter. Thrift was necessary even in the use of firewood. There were no warm comfortable bedrooms, and the water in the wash stand pitcher was often frozen. The definition of the word chore in those days included tasks the measure of a man, but assigned to a boy. Supplying a continuous flow of the fuel and water for the household and the care of the live-stock were part of young William's routine.

No gasoline conveyance carried him to the little red school house that still stands on the back corner of the farm and even now bears the McPherson name. Walking had objectives in those days. William learned systematic methods early in his efforts to complete his chores quickly enough to leave ample time for the preparation of his lessons.

It is said that men develop qualities of stamina and strength by reason of their difficulties. If so, those early years of this young boy helped to mould for him a strong body and a valiant spirit. Life on an Ohio farm also cultivated in William McPherson an at-homeness with Nature and with all kinds of people. His interest in growing things, whether utilitarian or beautiful remained always, and farm animals and orchardry continued to be of concern to him. A beautiful garden was an essential part of his living. Farm community life cultivated in him the quality of enjoying and understanding people, so that he possessed to a rare degree the ability to make others comfortable and at ease no matter what the occasion.

After completing the grade school, William attended the High School at Xenia, sometimes driving in the family buggy but usually riding the plow horse. Someone has said that the McPherson animals were all "well educated" for he recited his irregular verbs while milking the cows and feeding

the hogs. At any rate his lessons were well prepared for on the day of his high school commencement, the entire family, dressed in their Sunday clothes, went to town to hear their youngest member deliver the principal address as the class valedictorian.

Because of his outstanding record, his parents made it possible for William to enroll at The Ohio State University in the autumn quarter of 1883, just ten years after the university opened its doors. At that time, there was no organized athletics on the campus, but this young man from Greene County, with his superb physical endowment, soon became a leader in field sports. He excelled especially in running and in the broad jump. In his sophomore year, he won the Franklin Award given in the first Class Day athletic contest. Needless to say, his scholastic work was of the highest grade and it was recognized later by both the Societies of Phi Beta Kappa and Sigma Xi.

After graduating in 1887, he turned his attention to a teaching career. He accepted an instructorship in physics for the years 1887-1889 and in chemistry and latin for 1889-1892 in the High School and the Manual Training School of Toledo, Ohio.

On June 21st, 1893, William McPherson married Miss Lucretia Heston of Toledo, Ohio. To them were born two children, William Heston, now of the Institute of Labor and Industrial Relations of the University of Illinois, and Gertrude May, now Mrs. Malcolm P. Mouat, of Janesville, Wisconsin. Mrs. Lucretia McPherson died on August 23rd, 1923.

On April 18th, 1925, William McPherson married Miss Mary Browning Henderson, the sister of William E. Henderson. The McPherson home has always been a center of happy living, good conversation and gentle hospitality: children and young people were given special welcome and enjoyed Dr. McPherson's buoyant humor.

William McPherson, in 1892, received an invitation to return to The Ohio State University as an assistant to Prof. Sidney A. Norton who was then Chairman of the Department of Chemistry. The quality of the young teacher's work was soon rewarded. He was advanced to an assistant professorship in 1893; to an associate professorship in 1895; to a professorship in 1897. This early period and the years following were very momentous ones in those phases of chemistry that called for a greater understanding of the more fundamental physical aspects of the science than had hitherto been available. Laboratory work for students in first year chemistry as well as text books written in the light of the newer physical-chemical concepts became pressing necessities. William McPherson and his collaborator, William E. Henderson, addressed themselves to this challenging problem. Out of their combined effort these needs have been most successfully met.

Among some of his extra-mural contacts, Dr. McPherson served both the Ohio State Dairy and Food Commission as a collaborating chemist from 1907 to 1912, and in the same general capacity the Bureau of Chemistry of the United States Department of Agriculture from 1908 to 1917.

The growing emphasis on graduate education and the increase in the number of students desiring advanced study led to the establishment in 1911 of the Graduate School. Dr. McPherson was assigned the task of organizing this newly created division of the University and was appointed to be its first Dean. He continued in his office for twenty-six years, at which time he retired from his academic duties as the Emeritus Dean of the Graduate School. During his administration, the Graduate School grew from a registration of three hundred students in fifteen departments of instruction to an enrollment of thirty-three hundred students in fifty-six departments. All over the country there are former students who gratefully attest to the sympathetic interest and encouragement that they received from Dean McPherson. The faculty, too, bear witness to his stimulating leadership and his activity in securing funds for furthering research and scholarship.

On two different occasions, Dean McPherson was called upon to serve The Ohio State University as Acting President due to the retirement of William Oxley Thompson in 1924, and of George Washington Rightmire in 1938. In these critical periods, he administered the affairs of the Presidency with rare judgment and in a spirit of friendliness that won the confidence of the citizens of Ohio. At the conclusion of this service to the University, the Board of Trustees conferred upon Dean McPherson the title of President Emeritus of The Ohio State University.

In addition to the baccalaureate degree, B.Sc. in 1887, William McPherson received the degrees of Master of Science, M.Sc. in 1890 and Doctor of Science, D.Sc. in 1895 from The Ohio State University; Doctor of Philosophy, Ph.D. from the University of Chicago in 1899; the Honorary Degree of Doctor of Laws, LL.D. from Wittenberg College in 1927; and Honorary Degree of Doctor of Laws, LL.D. in 1940 from The Ohio State University.

When Dr. W. A. Noyes founded *Chemical Abstracts*, he invited Dr. Austin M. Patterson of Xenia, Ohio to join him as associate editor of this new journalistic enterprise of the American Chemical Society. When the latter succeeded to the editorship, family responsibilities and convenience of travel prompted him to approach Dr. McPherson on the matter of moving the *Chemical Abstracts* office from the University of Illinois to The Ohio State University. Realizing the advantage to the Faculty of having access to the large collection of periodicals, many of them rare, that *Chemical Abstracts* receives, and, too, evaluating the personal contribution that such men as Dr. Patterson, Mr. J. J. Miller and later Dr. E. J. Crane would make to The Ohio State University Chemistry family, Dr. McPherson immediately offered the facilities and the hospitality of the University to this new journal. The wisdom of his decision has proven of mutual advantage for forty-two years.

In regard to the American Chemical Society, William McPherson was one of its most enthusiastic supporters. He was very much aware of the value of its publications and of its organization into geographical sections that enabled chemists

throughout the country to follow the progress of the science. He was the first chairman of the Columbus, Ohio, Section which was founded in 1897. From the initial group of one hundred and five members, it has now grown to a membership of five hundred and ninety.

In the official structure of the American Chemical Society, Dr. McPherson served as one of its vice-presidents in 1909-1911; as councilor in 1923-1926; as member of the executive committee and president in 1930. He was one of the wise and far-seeing leaders who have contributed to the unprecedented growth and usefulness of the Society. He served as the representative of the American Chemical Society on the executive board of the National Research Council.

William McPherson, in 1917, was a member of the group that responded to the Nation's call for chemists, when it was learned that poison gas was being used as an instrument of warfare. He left his academic activities and proceeded to Washington, D. C., to serve in a civilian advisory capacity in the Trench Warfare Section of the United States Army. Later he was commissioned as a captain in the reserve Corps, from which he was called into active service on the staff of the head of this newly created branch of the military organization.

Captain McPherson was promoted to the rank of major in the National Army in January of 1918 and on July 13th, 1918 he received the rank of lieutenant-colonel in this new military service. He was made responsible for the relations existing between

Edgewood Arsenal and the extra-mural chemical organizations upon which the Arsenal would depend for service and coöperation. In his line of duty, he was called upon to represent the United States Chemical Warfare Service in its contacts with the Inter-Allied Conference on Gas Investigations held in Paris. While on one of these important missions, the Armistice was signed. He returned to America on December 11th, 1918, but his duties compelled him to remain in the service until March 24th, 1919 when he received his honorable discharge from the United States Army. After this military interval, he returned to The Ohio State University to whose success he had consecrated his life.

The following years were filled with useful service; giving to the limit of his strength and time to the advancement of his Alma Mater and exerting in his scientific writing a strong and widespread influence in the training of young people.

After a prolonged illness, this very notable and distinguished career came to a close on the morning of October the second 1951. William McPherson was a man of many gifts, not least of them being a talent for friendship and a sincere interest in those whom he called friends. His ways of showing this could be verified by many who caught their inspiration from his lips and from his life. When to his personal charm is added his ability as teacher and chemist and administrator, William McPherson will remain in the memory and hearts of those who knew him as a man of great stature.

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[CONTRIBUTION FROM THE CHEMICAL INSPECTORATE, BRITISH MINISTRY OF SUPPLY]

## The Preparation and Properties of Silicomolybdic Acid. I. The Properties of Alpha Silicomolybdic Acid

BY J. D. H. STRICKLAND

Silicomolybdic acid has been prepared by a new and convenient synthesis and absorption spectra of the pure acid measured with an ultraviolet spectrophotometer. Most of the reported properties of the acid in solution have been confirmed and a detailed study made of its reduction with stannous chloride. The silicomolybdate anion is reduced in its entirety, probably by the addition of hydrogen atoms, to give two blue compounds, both of which still contain the silicon and molybdenum atoms combined in the ratio 1:12. Absorptiometric and potentiometric studies have shown that one compound,  $\alpha$ -silicomolybdous acid, corresponds to the addition of four electrons and the other,  $\alpha$ -hyposilicomolybdous, to the addition of five electrons. Absorption spectra and other properties of these reduction products are noted.

### Introduction

The determination of small quantities of silicon by the formation of silicomolybdic acid and the subsequent measurement of the light absorption of this compound, or its reduction product "molybdenum blue," is now established analytical practice.

Jolles and Neurath<sup>1</sup> were probably the first to suggest that the formation of silicomolybdic acid could be employed in analysis, and later Isaacs<sup>2</sup> introduced the subsequent reduction of this compound. The analytical literature of the past twenty-five years contains a very large number of methods, adapted for particular materials using carefully standardized conditions. In all cases, however, the analytical conditions have been determined empirically and little is known concerning the reactions which take place during the analysis. It is generally recognized that the formation and reduction of silicomolybdic acid is dependent upon time and pH, and most of the investigations of a more fundamental nature have been designed to determine the most suitable values for these variables. Unfortunately, very little agreement has been reached, especially with regard to pH, and authors give values for the optimum acidity necessary for silicomolybdate formation which often differ widely.

This unsatisfactory state of affairs makes it very difficult for the analyst to vary conditions or to design new methods without making, each time, a

fresh series of investigations. It was decided, therefore, to investigate fully the mechanism of formation and reduction of silicomolybdic acid. The subject has proved to be considerably more complicated than was expected, owing to the discovery of the existence of at least two distinct forms of the silicomolybdate anion and of several reduction compounds thereof. This investigation has, therefore, been restricted to a brief preliminary survey of the subject with some emphasis on such aspects of it as may be of value in analytical work. A complete elucidation of the mechanism of formation of a molybdate heteropoly acid, such as has been achieved by Souchay and collaborators with heteropoly tungstates,<sup>3</sup> is impossible without a fuller knowledge of the chemistry of the parent molybdate species than we at present possess. Nevertheless, the work described in this and following papers has thrown some light on the number of molybdate species present in acidified solutions.

The discovery of the existence of two types of silicomolybdate makes it desirable to describe in this first paper some of the more characteristic properties of solutions of the only type previously recognized, which will be called  $\alpha$ -silicomolybdic acid. This compound has the empirical formula  $H_4SiMo_{12}O_{40} \cdot 29H_2O$  and its structure in the solid state has been well established.<sup>4</sup>

(3) For a summary of much of this work see M. Jean, *Ann. chim.*, **3**, 470 (1948).

(4) See, for example, J. F. Keggin, *Proc. Roy. Soc. (London)*, **A144**, 75 (1934); J. W. Illingworth and J. F. Keggin, *J. Chem. Soc.*, 575 (1935).

(1) A. Jolles and F. Neurath, *Z. angew. Chem.*, **11**, 315 (1898).

(2) M. L. Isaacs, *Bull. soc. chim. biol.*, **6**, 157 (1924).