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OF

THOMAS CORWIN MENDENHALL

1841-1924

BY

HENRY CREW

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A sense of historical continuity is quite as essential to the advancement of science as to the growth of a nation. The man of science who has no memory for its past is not likely to be greatly concerned about its future. When Newton spoke of standing upon the shoulders of those who preceded him, he expressed a capital interest in the past. In some idea such as this doubtless lay the prime motive which led the early members of this Academy to institute a series of biographical sketches of its members.

The writing of such a sketch, however, is not easy. There is first of all the limitation of space imposed by rule, some fifteen or twenty pages. Besides this there is the difficulty of conveying to any, save a few, of one generation the relative importance of the work of the preceding generation. No man has ever appreciated Galileo more highly than did Newton; yet the experimental work of the great Italian must have impressed the Cambridge scholar as crude. *Mutatis mutandis*, the same might be said about Fresnel and Michelson; or about Rumford and Joule. Again, to tell the truth about an experiment in physics is child's play, compared with telling the truth about a man; for even a man of science is a social as well as a rational being; and his achievement in the increase of knowledge is not the whole of what makes him a valued member of this Academy. His uprightness, his courage, his generosity of mind, his geniality of spirit—or perhaps the want of it—are qualities which his successors deserve to know. Herein lies a second motive for these biographies. With these considerations in mind let us proceed to the life of our late colleague, Thomas Corwin Mendenhall.

ANCESTORS

His ancestry traces back to a family which came to this country as members of the Penn colony in 1686 and settled in Delaware county, in the extreme southeast corner of the state of

Pennsylvania, and in a village which was then called Concord, but which now enjoys the name of Concordville. In this same neighborhood, there is, at the present time, on the Maryland Division of the Pennsylvania railroad, a station named Mendenhall.

It is generally agreed that the earlier form of the family name was Mildenhall; but there is a curious uncertainty as to the exact location of the ancestral home; for it happens that in England there are *two* towns which carry the name of Mildenhall, one in the northwest corner of the county of Suffolk and another in the northeast corner of Wiltshire. In *American Ancestry*, 8, 60 (1893) one finds the definite statement that Benjamin Mendenhall came from Wiltshire, England, in 1686 and settled in Concord, Pennsylvania; while in George Smith's *History of Delaware County*, p. 484 (Philadelphia, 1862) one reads that "Benjamin Mendenhall came from England in 1686 probably in company with his brother, John. They came from a town of Suffolk called Mildenhall, that being the original family name." This latter view harmonizes with the following statement in the *Publications of the Genealogical Society of Pennsylvania*, 4, 249: "Benjamin Mendenhall came from a town in Suffolk, England, called Mildenhall in 1686. He settled in Concord." Henry Graham Ashmead in his *History of Delaware County*, p. 563 (Philadelphia, 1884) says "Three brothers, John, Benjamin, and George Mendenhall came from England with William Penn in 1682. George returned after a brief sojourn in America, John settled in Chester county and Benjamin found a home in Concord township in Delaware county. He was married to Ann Pennell and had sons, Robert and Benjamin."

Any doubt as to whether our Mendenhall family came from Wiltshire or from Suffolk is, I think, largely removed by the existence of a deed which conveys "500 acres of land in Penn's tract to Moses Mendenhall of Ramsbury, Wilts., date 1685, Sep't. 5th." A copy of this deed is given opposite p. 9 of a *History, Correspondence and Pedigrees of the Mendenhalls of England and the United States* by William Mendenhall, of Bath,

England, extended by his son Edward Mendenhall of Cincinnati, Ohio. (Cincinnati: Moore Wiltach & Baldwin, 1865.)

Charles Sumner is credited with the remark that he never passed a small boy on the street without feeling the urge to lift his hat, realizing the possibilities which are latent in the mind and body of such a lad. It is the absence of just such an urge, I fear, which has been responsible for the laxity of our habits and laws concerning the registration of births, marriages, and deaths. It is, in fact, the absence of just such a record concerning the Benjamin Mendenhall who came to America with the Penn colony which makes the first section of this sketch slightly ambiguous.

From here on, however, the story is perfectly clear. As indicated above, the Englishman, Benjamin Mendenhall, who came to America and joined Penn's colony had a son named Robert who was born in 1713 and who also lived in Concord township, Pennsylvania, where he died in 1785. This Robert Mendenhall, who during his entire life was a contemporary and near neighbor of Benjamin Franklin, had a son, named Stephen, who married Mary Farlow. To them was born a son whom they called James and who was the grandfather of the subject of this sketch. James Mendenhall was still living in southeastern Pennsylvania when his son Stephen, the father of our subject, was born in 1805. Shortly after this, in 1810, the family of James Mendenhall moved to what was then known as "the far west," Beaver county, Pennsylvania.

Left fatherless at an early age, this Stephen Mendenhall returned to the neighborhood of Philadelphia, where, a few years later, Mary Thomas became his wife. With her he journeyed again, in 1835, to "the far west," this time making a new home in Columbiana county, Ohio, just across the state line from Beaver county, Pennsylvania. To Stephen Mendenhall and his wife three sons and two daughters were born. The birth of the youngest son occurred on the 4th of October, 1841, while the family was still living at Hanoverton in Columbiana county. The little lad was named Thomas Corwin after a much beloved man, at that time Governor of Ohio, who was later appointed

Secretary of the Treasury and who still later was our Minister to Mexico.

YOUTH

Here, in the beautiful hills of eastern Ohio, the young Mendenhall spent the first twenty years of his life, the twenty years just preceding the first administration of Lincoln, twenty years in a Quaker family where the parents not only advocated, but also practiced, the simple life, frugality, sincerity, plainness of speech and dress, temperance, and the abolition of slavery.

The elder Mendenhall was a carriage-maker and had the pleasure of having his two older sons as partners. In addition to this business, he maintained a farm. Now the amount of knowledge concerning the properties of matter, the behavior of machines, and the processes of life which an eager and gifted boy picks up during twenty years of association with the lathe and work-bench of his father's carriage shop, in running the engine for his brother's steam saw mill, in assisting his mother in the churning of cream, in watching the mining of coal from the adjacent hills, in observing the building of the Cleveland and Pittsburgh railroad, is something amazing. All these and many more details are set forth in a story of his youth which Professor Mendenhall wrote, at odd times, during his years of rest, 1901-1911, spent in Europe. These *Recollections* of Professor Mendenhall, as I shall call them for the sake of easy reference, cover some 900 pages of manuscript and give a pleasing picture of abundance without overproduction, of economy as a fine art, of comfort and independence, and of the happy domestic life of the early Ohio settlers. The whole narrative is written in an easy—almost conversational—style and is, in my judgment, well worthy of independent publication.

Mendenhall's first-hand acquaintance with the world was supplemented by the usual primary school training of the period and by his own independent pursuit of mathematics, a subject to which he was ardently devoted. His well-known ability as an expositor was early adumbrated in his desire to teach school; an ambition which was first satisfied in the autumn of 1858 when he became assistant to the principal at Marlboro, in Stark county,

Ohio, a town to which the Mendenhall family had moved in 1852.

In the spring of 1859, he attended a teacher's institute at Alliance, Ohio, and there came under the brief instruction and influence of James A. Garfield, at that time president of Hiram College. The young teacher was much impressed by Garfield's definition of an adverb as "the skin of a verb stuffed with the bran of an adjective."

Much more powerful was the influence of Professor C. A. Young, the eminent and beloved astronomer, then teaching in Western Reserve College in Hudson, Ohio. Here Mendenhall had the rare privilege of studying with Young during the summer of 1864. Like all the rest of Young's students, Mendenhall felt about him much as Helmholtz did about his great teacher in physiology: "Once to have known Johannes Müller is forever after to be a different man."

The incident which brought to Mendenhall a brief period of study in an institution of collegiate rank is, at the same time, an excellent illustration of the power of the printed page. In the spring of 1861, he was looking over the shelves of a book-store in Cleveland, Ohio; and, having lighted upon a copy of Stoddard and Henkle's *Algebra*, he was so delighted with their novel mode of presentation that he then and there determined to pursue the subject under the immediate personal instruction of a man who could expound mathematics so clearly. The result was that he at once went to the Southwest Normal School at Lebanon, Warren county, Ohio—the home town of Tom Corwin—where W. D. Henkle was then teaching. Within a year he graduated with the degree "I. N.", *Instructor Normalis*, the only degree in course which he ever received. For the interpretation of this degree, "I. N.," I am indebted to the charming little biography of Mendenhall written by his friend Professor W. H. Siebert, of Ohio State University, as a part of a *History of the Columbus High School*.

The years between Mendenhall's leaving Lebanon and his election to the first faculty of Ohio State University in 1873 are crowded with important events in American history; but in the

story of the Mendenhall family the one outstanding fact is the marriage of Mr. T. C. Mendenhall to Miss Susan Allen Marple on July 12, 1870. Miss Marple was a descendant of Major Solomon Allen who carried Major André back to West Point after his capture; her home was in Columbus, and she was a student in the high school where her prospective husband was teaching. This union was the beginning of a long and devoted companionship, extending through the next forty-six years, that is, up to the time of Mrs. Mendenhall's death in 1916. On the first day of August, 1872, the new home was brightened by the birth of a son, Charles E. Mendenhall, well-known physicist and present member of this Academy.*

PROFESSIONAL LIFE

By this time the young high school teacher had proved himself to be an excellent demonstrator and an attractive public speaker. He had a rich tenor voice and that innate courtesy which comes from a consideration for the feelings of others. In his experience in various parts of the state, he had made the acquaintance and had acquired the respect of a number of its leading citizens. Moreover, he was able to qualify as a university professor under the definition laid down by President D. C. Gilman of Johns Hopkins University, namely "a student who can also teach." When, therefore, the Ohio Agricultural and Mechanical College—one of the first of the Morrill Land Grant institutions—opened its doors in 1873, it was in every way natural that this well-known teacher of science was appointed to the chair of physics and mechanics. Here, for the next five years, he went through the usual routine of a university professor at that time, attending also to various subduties, such as outside lectures, the chairmanship of certain committees, the general secretaryship of the American Association for the Advancement of Science, etc.

From the very start Mendenhall was one of the group who were in favor of taking advantage of the liberal provisions in the

* Died August, 1935.

Morrill Act and of making the institution liberal in the best sense of that word. The name of the college was shortly changed to Ohio State University, an institution recognized as one which, in the phrase of the Morrill Act, "promotes the liberal and practical education of the industrial classes * * * without excluding other scientific and classical studies."

Of the original faculty, the two leading men were doubtless Edward Orton and T. C. Mendenhall. Many years later, the latter of these two men made the following remarks concerning this first faculty:

"I shall avoid making comparisons of their work with that of their successors of today, for they belong to a different class. In many respects 1870 is to 1920 a period of almost indefinite remoteness. The college professors of today partake very largely of the nature of a manufactured article. They are highly specialized and accurately standardized. Most of the larger and some of the small institutions of learning are engaged in their production; and by some they are kept 'in stock' for the convenience of others. Today the chancellor of one great university may call by wireless telephone to the president of another something like this: 'Please send me at your earliest convenience one Ph. D. who has "majored" in this and "minored" in that, who has published not fewer than five original papers of not less than one thousand words each, and whose intelligence test is not below 155 nor above 200.'

"The first faculty of the University was not recruited in that way. In 1870 there were no such sources of supply, and the college professor of that period was more or less an accidental product; and yet, in one important sense, far less an accident than his successor of today, for in most cases a professorship was the goal of an ambition dating from early youth." *History of Ohio State University*, Vol. 3, p. 189.

RESIDENCE IN JAPAN

In the spring of 1878, the late Dr. Edward S. Morse returned to America during a brief interval between his visits to Japan and was stopping with his long-time friend Mendenhall in Columbus where he was lecturing upon Japanese homes and Japanese art. This distinguished naturalist carried with him from Japan what was practically a commission to appoint two Ameri-

can professors in the University of Tokio, one to the chair of philosophy, the other to the chair of physics. This commission he executed by recommending Professor E. F. Fenollosa in philosophy, and Professor T. C. Mendenhall in physics. Both recommendations were adopted by the Japanese government; and both men accepted appointment. The autumn of 1878 found Mendenhall, with his family, in Tokio where he was one of that outstanding group of western scholars who at that period were giving themselves unselfishly to the introduction of our mode of thought into the Orient.

The schedule of work, as first planned by the university, he voluntarily increased, giving public lectures by use of an interpreter, exhibiting the newly invented telephone to members of the nobility, and devoting much energy to the equipment of the laboratory of physics; for, as he remarks in his *Recollections*, "I was young, strong, and loved work." Many of his eager and able Japanese students became life-long friends, notably Kikuchi who interpreted his early lectures to popular audiences, and who later became Minister of Education, and still later, as Baron Kikuchi, Vice-Minister of the Navy. Tanakadate and Fujisawa made brilliant careers as students in European universities, and later by their original contributions in the field of physics.

Among the foreign contingent on the university staff at Tokio in those days, may be mentioned, in addition to Professors Morse and Fenollosa, the name of W. S. Chaplin, later Chancellor of Washington University at St. Louis, and the four well known English engineers, John Perry, William E. Ayerton, James A. (now Sir Alfred) Ewing, and John Milne.

Mendenhall's own investigations in Japan were mainly along the line of meteorology and geophysics. It was here that he determined the density of the earth by measuring the acceleration of gravity at sea-level and at the top of Fujiyama. Spectroscopy was then at a stage where accurate wavelengths in the solar spectrum were sorely needed. Mendenhall set about to supply these, employing the best apparatus available, namely a grating by Chapman and a spectrometer by Fauth, after the design of

C. A. Young. The results were published in a monograph by the University.

In the summer of 1880, a somewhat urgent request came from Dr. Edward Orton, then President of Ohio State University, asking Professor Mendenhall to return to Columbus and to devote himself entirely to physics, allowing Professor S. W. Robinson to take the new chair of mechanics. Home ties, old friends, and a charter-membership in the faculty of the state university were considerations too strong to be withstood. Accordingly the summer of 1881 found the Mendenhall family leaving Japan, but not without great reluctance. The following sentence from his *Recollections* will indicate something of the high regard which this professor of physics had acquired for his Japanese students; "Always fond of teaching and always enjoying my college work, I cannot but look upon my three years with these well-mannered, good tempered, ambitious, and intellectually strong men as being, in most respects, the pleasantest and best of all my professional years."

THE SECOND PERIOD AT COLUMBUS

Again in the chair of physics at Ohio State University with enlarged experience, widened horizon, and renewed vigor, Mendenhall gave himself generously to the routine duties of his office and to such extramural demands as the vice-presidency of the American Association for the Advancement of Science for Section B, a course of lectures before the Lowell Institute upon the Molecular Theory of Matter, a report on atmospheric electricity to the Electrical Conference of 1884 in Philadelphia, and various popular addresses. It was during this period that Mendenhall originated, and secured financial support for, the Ohio Meteorological Bureau, the purpose of which was to gather a knowledge of meteorological conditions, to forecast the weather, to exhibit weather indications in public places, and especially to carry them on the sides of the railway trains which sped across the farms of Ohio. These were the days when the applications of electrical science were taught and demonstrated only in laboratories of physics; the days when, to use the phrase of Mr. Rod-

erick Macrae, "Lord Kelvin was creating the science of electrical engineering while he was thinking of other things." Naturally, therefore, Professor Mendenhall was deeply interested in the electrical exhibits at the Cincinnati Expositions, and served on the jury there; and likewise at the Electrical Exposition held at Philadelphia in the autumn of 1884.

Activities of this type brought him a call, in December of 1884, to a professorship of electrical science in the U. S. Signal Corps at Washington, D. C. Earlier in the autumn of this same year, he was one of the "coefficients" who attended the twenty "conferences" held by Lord Kelvin*, then Sir William Thomson, at Johns Hopkins University.

Having by this time become widely acquainted with men of science in Washington, Mendenhall accepted the proffered appointment and soon found himself associated in office with Cleveland Abbe, William Ferrel, and his former student, C. F. Marvin. General A. W. Greeley was on the staff, but at this time absent in the Arctic regions. It was at this period and a little earlier that Mendenhall became well acquainted with and a close friend of Henry A. Rowland at Baltimore. As chief of the Instrument Division in the Signal Corps, it became his duty to visit Charleston, S. C., immediately after the great earthquake of Aug. 31, 1886; and he was thus led to establish the earliest stations in the United States for the observation of earthquakes.

* Kelvin's *Baltimore Lectures* (Camb. Univ. Press: 1904) represent his final attempt to explain the phenomena of light in terms of an elastic solid theory. And since the names of his hearers—dubbed "co-efficients", in a humorous afterdinner poem, by the late Professor George Forbes—have not hitherto been published, so far as I am aware, it may be well to give here the following list furnished by Kelvin himself in a letter addressed to Johns Hopkins University under date of 14 January 1904: Lord Rayleigh, Henry A. Rowland, Eli W. Blake, Jr., Cleveland Abbe, Albert A. Michelson, Fabian Franklin, J. W. Moore, Diaroku Kikuchi, Arthur S. Hathaway, John R. Uhler, George Forbes, Henry Crew, John E. Davies, Thos. A. Smith, Louis Duncan, A. S. Kimball, John T. Hedrick, Clayton C. Hall, J. F. Arnold, Arthur L. Kimball, Christine Ladd Franklin, T. C. Mendenhall, J. M. Mansfield, Edwd. W. Morley, R. W. Prentiss, Gustav A. Liebig, Charles A. Perkins, R. W. Gatewood.

For his work in seismography, cartography and terrestrial gravity, he was awarded a gold medal at the Paris Exposition, 1900, and another by the American Geographical Society in 1901. Between office hours, time was found to prepare a small volume for the *Nature Series* which was then being issued by the Macmillan Company of London. The preface of the book, *A Century of Electricity*, is dated at Washington, D. C., May 16, 1886. As a piece of elementary exposition and as a clear historical recital of what happened in electrical science during the hundred years immediately following Galvani, the volume leaves little to be desired. It is, in fact, an excellent pre-Hertzian picture.

ROSE POLYTECHNIC INSTITUTE

During all the time Mendenhall spent in government duties, he never lost his high regard for the profession of teaching. In 1885, Ohio State University had made him an emeritus professor of physics; but no compliment of this kind ever slackens the activity of a man whose inspiration comes from within. Accordingly when a call came, in 1886, to the presidency of the three-year-old Rose Polytechnic Institute at Terre Haute, Indiana, he promptly accepted. Here he worked for three years, striving to place the education of engineers upon a solid foundation of training in the fundamental sciences, and to give the prospective engineer also linguistic and liberal studies sufficient to enable him to meet with ease his peers in the industrial, financial, and social world. Among his colleagues on the faculty here may be mentioned Professor Thomas Gray who held the chair of dynamic engineering, Professor W. A. Noyes, then at the head of the department of chemistry, now at the University of Illinois, and Professor James A. Wickersham, now emeritus professor of English, living in Terre Haute. It was at this period (1887) that Mendenhall was elected to membership in the National Academy of Sciences and, in the year following, to the presidency of the American Association for the Advancement of Science over whose sessions he presided at the Toronto meeting in 1889.

SECOND RESIDENCE IN WASHINGTON

Much indoor work had, however, begun to tell upon his hitherto robust health. Accordingly, when President Harrison's Secretary of the Treasury, Mr. Windom, offered him the superintendency of the U. S. Coast and Geodetic Survey in the summer of 1889, Mendenhall accepted, partly on account of his interest in geophysics and partly in the hope of more fresh air and sunshine. Again in Washington, many new acquaintances were added to those above mentioned. Fast friendships were cemented with S. P. Langley, J. W. Powell, Gardiner Hubbard, Graham Bell, Simon Newcomb, F. W. Clarke, and L. O. Howard.

The Bureau of Standards had not yet been created. "Weights and Measures" formed a subdivision of the Coast and Geodetic Survey; and the superintendency of this Survey was, with the possible exception of the directorship of the U. S. Geological Survey, perhaps the most important scientific appointment in Washington.

The multiplicity of duties connected with this office may be indicated by mentioning that within the next five years Mendenhall was engaged in a relative gravimetric survey, using the portable short pendulum of his own design; was off on a trip to Alaska in the interests of a boundary settlement; was a member of the first Behring Sea Commission; was a member of the U. S. Light House Board; and was an "official delegate" to the International Electrical Congress held in Chicago in 1893. In addition to these governmental duties, he found himself appointed on five different committees of the National Academy of Sciences; and in 1892 gave a second series of Lowell Lectures on "Measuring the Earth."

The interest attaching to the International Electrical Congress of 1893 arises largely from the fact that this was the assembly which gave to the so called "practical units" of electrical science their present form and meaning. It was here also that the last of these eight units—that of inductance—received its name, the *henry*. The legislative chamber, which was charged with decision as to units, names of units, and standards, was composed

of 26 members representing the more important nations of Europe and North America. Among others representing Europe, were Helmholtz, O. Lummer, E. Mascart, T. Violle, S. P. Thompson, W. H. Preece, W. E. Ayrton, and Galileo Ferraris. The American delegates were H. A. Rowland (President of the Chamber), T. C. Mendenhall, H. S. Carhart, Elihu Thomson and E. L. Nichols. Owing largely to national prejudices, the sessions were prolonged through an entire week in August. Many differences arose as to what were the essentials and what were the frills in the various phrasings of these eight definitions. The form finally adopted for the three basic units, *ohm*, *ampere*, and *volt*, and soon afterwards approved by the various national governments, [*Proc. Internat. Elec. Congress.* Chicago, 1893, p. 20. (1894)] was however a draft which Mendenhall had worked out, in the privacy of his own room, the evening before. The original of this protocol of Mendenhall's, to which Rowland, Helmholtz, Mascart and Ayrton had, in advance of its adoption, affixed their signatures is now in possession of the Franklin Institute. These details are introduced as evidence of Mendenhall's mastery of clear thought and concise English.

WORCESTER POLYTECHNIC INSTITUTE

President Cleveland, during his second term, placed no less than 44,000 appointments on the classified list of the civil service, thus bringing them under the merit system; but this did not prevent some of the members of his cabinet from beginning the redistribution of some of the better offices, even in the scientific bureaus, immediately after the inauguration, March 4, 1893. Opposed on principle to this feature of democracy, Mendenhall felt such appointments and dismissals, thrust upon the Coast Survey from the outside, to be an indignity. He still cherished his old love for the profession of teaching and accordingly resigned his Washington post in the spring of 1894 in order to accept the presidency of Worcester Polytechnic Institute in Massachusetts. In making this move Dr. Mendenhall entered his protest against the appointment of men to governmental posi-

tions of technical importance merely as a political reward and without any desire to improve the service.

The summer of 1894 was spent abroad. Then came seven years of educational and administrative work in which the effort was, with the aid of an able faculty, to secure the same high ends which were sought at the Rose Polytechnic Institute. And here again many extramural duties thrust themselves upon him. Chief among these was perhaps the chairmanship of the Massachusetts Highway Commission, whose problems, following the introduction of the automobile, were just then assuming a new and first-rate importance. It was about this time, 1895, that the new series of *Science* was begun. On the editorial committee, physics was represented by Dr. Mendenhall. In this same year, 1895, he became a member of the Society for the Promotion of Engineering Education; and so helpful and influential was he in the Council of that body that, in 1911, the Society elected him to honorary membership, the only distinction of the kind it had then granted.

EUROPEAN RESIDENCE

In 1901, President Mendenhall celebrated his sixtieth birthday anniversary, resigned his presidential office, and went to Europe, with Mrs. Mendenhall, in search of rest, recreation and health. This trip proved to be a very long one, covering ten years. The time was divided between the Azores, Geneva, Lucerne, Rome, Florence, Lugano and other parts of Italy. Dresden, Egypt, India and Japan were also visited. The warm—even affectionate—reception which the Mendenhalls received, in 1911, during their three months' stay in Japan was a grateful reward for services performed thirty years earlier. Any student of modern Japanese history will be well repaid in reading Mendenhall's excellent picture of the almost incredible changes which took place in Japan within this brief third of a century. His paper will be found in the *Journal of Race Development*, 2, 224-235, (January, 1912).

BACK TO OHIO

The last step in this long odyssey of eleven years brought the travellers, in 1912, to Ravenna, the principal town of Portage County, Ohio, in a neighborhood where relatives and old friends awaited them. Marlboro, the boyhood home of the Mendenhalls was only seventeen miles away: Cleveland only thirty in the opposite direction. Columbus was within easy reach. Ravenna offered much to a gentleman of leisure and a man of cultivated tastes. Here was a commodious home, genial friends, good books, wide interests, peace of mind, *otium cum dignitate*. Bereft, in 1916, of his devoted wife, the inspiring woman with whom he had travelled more than forty years of life and the mother of his worthy son, he was left much alone, yet with a host of priceless memories. Letters of sympathy came from many parts of the world.

Within the next few years, the Franklin Institute bestowed upon him the highest honor in its gift, the Franklin Medal. It was upon this occasion that he gave some of his *Metrological Memories* in the form of a highly interesting address. Here he relates just how, on April 5, 1893, in a very quiet, but thoroughly open, manner the United States standards of length and mass were shifted from the English yard and pound to the International Meter and Kilogram.

No one can follow the details of this man's life without early discovering his deep and lasting affection for Ohio State University. It was in this seat of learning that he first realized the ruling passion of his youth. Here he met his students a little more intimately than elsewhere. Members of his classes, among whom I may mention Mrs. W. H. Siebert and Professor Charles F. Scott, tell me that he never gave a lecture which did not challenge the interest of the hearer or one which was not, at some point, enlivened by humor. Here he gave his best, without money and without price. It was therefore a matter of deep satisfaction to him and to a host of his former students that Governor James M. Cox appointed him to the Board of Trustees of this university, a body which shortly elected him to its chairmanship. The new building devoted to physics was ap-

appropriately named the "Mendenhall Laboratory." One of his last and characteristic contributions to this university was the endowment of the Joseph Sullivant Medal (named in honor of an old friend), to be given once in every five years for an admittedly notable achievement by a son or daughter of the university.

His death occurred at Ravenna on March 22, 1924.

This brief and inadequate sketch may perhaps be brought to a close by a single paragraph from a universally beloved and lifelong friend of the man and of the university. In a letter to me under date of February 16, 1934, President Emeritus William H. Scott writes: "I knew Professor T. C. Mendenhall well before I became associated with him as a member of the same faculty, having met him at State Teacher's Associations, at a county association of which he was one of the instructors, and in my own home. As a teacher he was one of the two or three best I have known—clear, simple, attractive, and impressive. As a lecturer he excelled and was very popular. As a member of the faculty, he did his part with an eye to the whole as well as to his own department. Few men whom I have known had so many friends and admirers."

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- (i) A definite and easily observable length to measure, namely, the external diameter of the ring.
- (ii) The great rigidity of the pendulum; hence but slight departure from the measured figure when suspended.
- (iii) Detection of, and partial correction for, non-homogeneity of the pendulum.

Some estimate of the accuracy of which the method is capable, in good hands, may be obtained from the following results for two different rings:

$$(i) g = 980.526$$

$$(ii) g = 980.511$$

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