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WALTER CURRAN MENDENHALL

1871—1957

A Biographical Memoir by
THOMAS B. NOLAN

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Biographical Memoir

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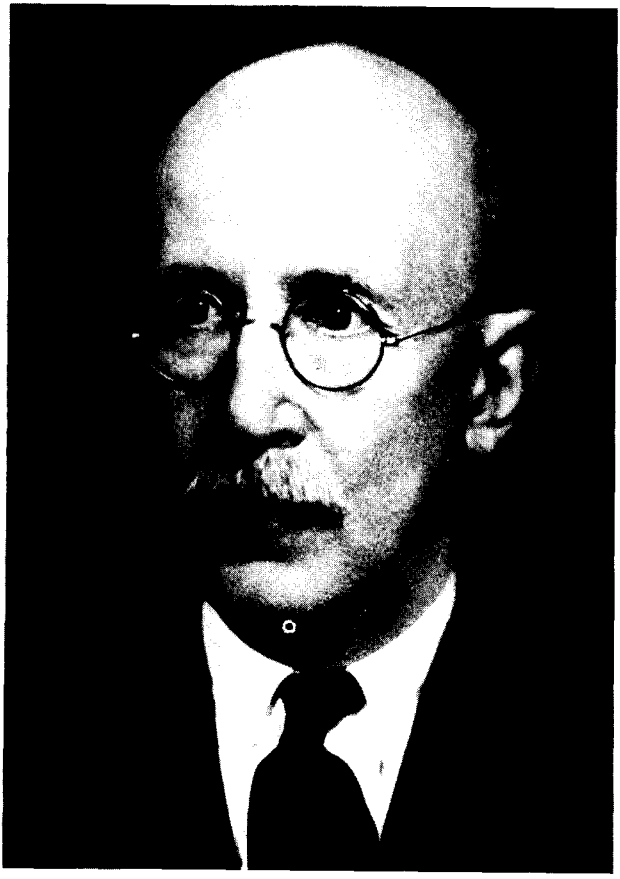

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February 20, 1871–June 2, 1957

BY THOMAS B. NOLAN

IN THE SCANTY biographical material that he provided the Academy following his election, Walter Curran Mendenhall listed as his occupations, "Farmer, student, and geologist." To these he might well have added, "explorer, administrator, and public servant." He will be remembered, by all who knew him, for the latter as well as for his accomplishments as a scientist and administrator. He would probably have felt that his greatest contributions, both to science and to the country, were effected through his devotion to absolute integrity. His insistence on the maintenance of the highest standards was evidenced in all the varied activities of the federal scientific agency with which he was associated for nearly fifty years.

Mendenhall was born in Marlboro, Stark County, Ohio, on February 20, 1871. The small community was a Quaker cultural and religious center. His father, William King Mendenhall, was a descendent of William Mendenhall who emigrated from England with William Penn. The Mendenhalls lived in Pennsylvania as farmers until the middle of the nineteenth century, when the paternal grandfather, Robert, moved to the farming community near Alliance, Ohio. He was remembered by his grandson as a "large man, well proportioned," who was "well-balanced, social, often selected by

neighbors as a trustee, etc." The father too, was tall, though slight, and was recalled as "social, and humorous."

The mother, Emma Pierce Garrigues, was of Quaker descent; her family had moved from Pennsylvania to Ohio at about the same time as the Mendenhalls. She and William King Mendenhall were second cousins. She began teaching school when she was fourteen years old and continued teaching for some years after marriage. Her son characterized her as "steady, stable, self controlled, retiring, and fond of reading." These phrases could equally well have been applied to the son, though he inherited his physical characteristics and his humor from his father.

Mendenhall's early schooling started in the country school at Marlboro, but was completed (through high school) in Portland, Oregon. There he lived for several years with the family of his mother's brother, Samuel Parker Garrigues, whom he characterized as "merchant, kindly, good business man." He then returned to Ohio and taught school for a short time before entering Ohio Normal University (now Ohio Northern University) at Ada.

While still an undergraduate, Mendenhall had been employed, initially as a teamster and laborer, by the U.S. Geological Survey, assisting M. R. Campbell with a study of the Appalachian coal fields. Campbell, some thirteen years older, had been a family friend and must have been largely responsible for Mendenhall's decisions to enter the field of geology and to affiliate with the U.S. Geological Survey—two decisions that determined the remainder of Mendenhall's long career.

There seems to be no indication of other factors that led to these decisions, as there is no evidence in Mendenhall's family background or in his schooling of what became so profound an interest in earth history. Even in a letter that he wrote in early 1893 to Senator Brice of Ohio, asking him

to intercede with Major Powell (Director of the U.S. Geological Survey at that time) in his behalf, there seems to have been no particular interest in geology. He wrote, characteristically emphasizing a concern on performance, "You may rest assured that if I should secure the appointment it would fall to one who fully appreciates the opportunities it offers for study, and who would go out to *work* and make the most of those opportunities, and not for a summer's vacation."

Mendenhall graduated from Ohio Normal in 1895 with the degree of B.S. and immediately entered full-time work with the U.S. Geological Survey—again as assistant to Campbell in a continuation of the coal basin studies. Except for leaves of absences in 1896–1897 for a year of graduate work at Harvard and in 1899–1900 for a year of study at Heidelberg, Germany, Mendenhall remained a member of the Survey until his retirement February 28, 1943.

The young man from Ohio quickly impressed his colleagues and superiors in the U.S. Geological Survey. His first publication in 1896, as junior author with Campbell, grew out of their geologic exploration in the southern extension of the Pennsylvania coal fields. Such early joint authorship was unusual and must have indicated the prompt recognition, by his colleagues and superiors in the Survey, of his competence and energy—both physical and mental.

These qualities were of prime importance in his assignments during the next several years, for he was one of the small number of Survey geologists selected to carry out explorations—geographic as well as geologic—in the vast little-known area of Alaska. On the first of these, in the summer of 1898, he was attached to a military expedition; however, on succeeding trips in 1900, 1901, and 1902, the projects were under Survey auspices without direct military support.

Except for the field season of 1899, when he was an assistant to George Otis Smith in a mapping project in the central

Cascade Mountains of Washington, Mendenhall spent the years through 1902 in exploratory work in Alaska. His first assignment, as geologist to Military Expedition No. 3 was a reconnaissance from Resurrection Bay to the Tanana River. The discoveries of gold in the Klondike in 1896–1897 generated a demand for knowledge of possible routes to the mineralized areas in interior Alaska, and this expedition of 1898 was directed to seek information on possible wagon or railroad routes inland from the coast. Mendenhall's route, as it turned out, proved to be the one that was eventually followed in part by the Alaska Railroad, as well as passing through the area later colonized in the Matanuska Valley. In his report, Mendenhall notes that "in two months and two days after leaving [the present site of Anchorage], having travelled in the interim about 670 miles, [he had] mapped topographically and geologically some 400 miles of hitherto unexplored country."

The two seasons of 1900 and 1901 were in even more remote country, northwest of the Yukon River, between it and Norton and Kotzebue sounds. The 1901 expedition, from Fort Hamlin to Kotzebue Sound, covered between 1100 and 1200 miles; it led him to observe that "exploring expeditions in high latitudes . . . are limited in time, and hence . . . certain sacrifices must be made to the paramount necessity of gaining ground. Work under these conditions cannot be uniform in quality. Observations made while the observer is struggling ahead at the end of a tracking line, or bending all his energies to the prevention of disaster in the wild waters of a gorge, or perhaps zigzagging up a 1000 foot climb with 90 pounds on his back, are not always as complete as is desirable. It is hoped, however, that such conditions have not resulted in other inaccuracy than that due to incompleteness."

One understands Mendenhall's uncharacteristic note of apology in the above quotation on reading that one phase of the expedition involved an 18-mile portage of boats and equip-

ment over a summit that reached elevations of 1500 feet above the Yukon and Kobuk drainages. More characteristic is the expressed concern over maintenance of quality of his observations.

The final Alaskan season of 1902 was spent in the Copper River region, where Mendenhall and F. C. Schrader developed knowledge of the geologic framework and provided a sound appraisal of the economic potentiality of a region that was being vigorously explored for base metals deposits as well as gold. Typically, he presented what must have been an unpopular conclusion in respect of the inflated claims, so often made during the period, of the mineral potential of the new territory. He and Schrader wrote,

"We regret our inability to present as encouraging a report for the section as has been made by the prospectors. . . . The opinion is forced upon me that the assay returns which have led prospectors to believe that platinum exists in commercial quantities . . . must have been faulty. We do not believe that the metal . . . exists in the Nadina field. . . . Samples of the rock that was supposed to carry the tin . . . proved not to carry the metal."

The explorations in Alaska were followed by a series of assignments of a very different sort. In 1903, Mendenhall was asked to undertake a study of the groundwater resources of southern California. He continued work there until 1908, and during these five years produced a series of reports on the supplies of water available both in the California coastal plain areas southward from Los Angeles and in the San Joaquin Valley.

The rapid development of irrigation in southern California after about 1900 had resulted in the essentially complete appropriation of the surface waters and in a significant decrease in both the amount of artesian water available and in the areas from which artesian flow could be obtained.

The reports prepared as a result of the five years in Cali-

fornia anticipate to a remarkable extent three elements that were characteristic of Mendenhall's later career as an administrator and public servant: a deep feeling of individual responsibility in the public interest; an acute awareness of the practical aspects of development of natural resources; and, above all, the need for thorough and detailed understanding of natural processes, and for the research that would provide the basis for this understanding.

During his first year in California he recognized the problems, and dangers, of uncontrolled and rapid development. In a report prepared at that time he wrote, "if . . . it is . . . understood that each additional plant installed . . . is at the expense of those already in existence, it is better [to curtail new developments] . . . than to . . . [obtain] a temporary increase in industrial activity."

This early recognition of the need for conservation, which preceded by several years the 1908 White House Conference, was expanded in later reports: "A strong public sentiment, therefore, should be created, which will under all circumstances oppose the careless use of artesian wells," and an even more present day expression of concern, "The promoting and speculative spirit, the desire to get rich overnight, to control large holdings, and to avoid personal labor, will have to be superseded by a willingness to be satisfied with sure but moderate returns, to be content with small farm units, and to attain personal independence through individual efforts."

This concern for the public interest characteristically was accompanied by a recognition of the practical aspects of irrigation farming. F. H. Newell in a preface to one of Mendenhall's reports of this period wrote, "The author has had consistently in mind . . . the needs of the practical irrigator and the questions which must arise in disputes concerning title to percolating waters." The reports contained thorough discussions of such matters as pumping costs, sound irrigation practices and the like.

Throughout the series of reports prepared in this period is the emphasis on the need for an adequate scientific understanding of the geology and hydrology of the natural resource. He wrote, "Obviously a resource which has become as important to the continued welfare of so rich a district is worthy of careful study." Mendenhall became one of the earliest students of the principles of groundwater hydrology. He introduced quantitative elements into his discussions of the available supplies, as well as emphasis on the geologic factors. Some of the earliest estimates of "safe yield" from the groundwater reservoirs were presented, as well as such modern concepts as the possibility of constructing check dams as a mechanism for recharging the underground aquifers.

One of the last of the projects undertaken during this period was a study of "Some Desert Watering Places in Southeastern California and Southwestern Nevada" instigated by the mining boom of the early 1900s in this area. One earthy piece of advice —which is still valid for portions of the West—concerned the then rather frequent misfortune that befell the casual prospector:

"With some persons . . . the faculty of getting lost amounts to genius. They are able to accomplish this wherever they are. The only suitable advice for them is to keep out of the desert. There are safer places in which to exercise their talents."

The groundwater work in California was Mendenhall's last systematic geologic fieldwork. He was transferred to the headquarters of the U.S. Geological Survey in Washington on July 1, 1908, to become Geologist in Charge, Underground Water Investigations. This marked the beginning of his career as a scientific administrator which was to continue for thirty-five years through the rest of his professional life.

As the supervisor of the Survey's groundwater work, the concepts and techniques he had so skillfully and successfully utilized in southern California were now applied over a much wider area. Mendenhall was an extremely effective supervisor—

leading, but not dominating, and generating loyalty and high performance in the men and women in his units.

After four years as chief of groundwater studies, Mendenhall was asked to assume the chairmanship of the Land Classification Board, of which he had been a member since 1908. With his transfer, the Board became the Land Classification Branch (now the Conservation Division of the Survey), and Mendenhall's responsibilities now included supervision of regulatory activities, as well as the scientific ones that had characterized his previous position. Major functions of the Branch were to identify mineral lands for withdrawal from entry pending their proper classification, to classify the public lands for mineral or water potential, and to determine values as a basis for transfer to private ownership. After passage of the Mineral Leasing Act in 1920 the functions of the Branch were expanded to include the administration of that Act.

At that time there were five major operating Branches or Divisions of the U.S. Geological Survey; Mendenhall had served in four. He had begun his career in the Geologic Branch; his Alaskan work was under the direction of what was to become the Alaskan Division; his California assignment was in the hydrology unit that became the Water Resources Division; and he chaired the Land Classification Branch, the predecessor of the Conservation Division. Only the Topographic Branch had been omitted from this broad range of experience, although the Alaskan exploratory trips had in fact involved essentially as much topographic, as geologic, mapping.

In November 1922, Mendenhall returned to his first organizational unit, the Geologic Branch, as Chief Geologist. In this position he succeeded David White, who had requested relief from administrative work to resume his own paleobotanical work. Mendenhall further developed the high standards established by his predecessors, among whom were White, G. K. Gilbert and Waldemar Lindgren. Gilbert, who had been

a member of one of the four exploratory Surveys that were merged to form the Geological Survey in 1879, was in many respects, the scientific mentor of Mendenhall. Even after his death in California in 1918, Mendenhall's Survey career was deeply influenced by his memories of Gilbert.

Mendenhall was especially insistent on maintaining high standards, through close control of the employment of young geologists for the Survey. Under his leadership, the U.S. Civil Service entrance examination for Junior Geologists became a nationwide measure of excellence, and practically all universities encouraged their students to take it, regardless of their ultimate job objectives. The relatively few, in those days, who were given employment in the Survey found an environment that was stimulating in the extreme. A clue to his success in recruiting employees of high quality is the disproportionate number of geologists of that vintage on the staff of the Survey who became members of the Academy.

Viewed in the context of the times, Mendenhall's record as Chief Geologist is even more impressive. The years following World War I were times of considerable stress. Funding was low in the aftermath of the war, and the applied work of the Survey during the War, together with the great expansion of the petroleum industry, resulted in a large number of resignations by the more experienced Survey geologists to enter industry. Maintaining high standards while rebuilding the geologic staff required full use of his administrative talents.

Increasingly too, he was called on to act as Director during the absences of George Otis Smith, and when Smith resigned at the end of 1930 to become Chairman of the Federal Power Commission, Mendenhall was named Acting Director. The following year he was appointed by President Herbert Hoover to be the fifth Director of the Survey. He continued to serve in this capacity until his retirement, after two Presidential extensions, February 28, 1943.

In accepting the appointment as Director, Mendenhall outlined his concept of the responsibilities of the position in a memorandum to the then-Secretary of the Interior, Ray Lyman Wilbur. He wrote, "Insofar as my part in Survey affairs may be effective, it will be directed toward fostering closely coordinated team work, to the end that the products of Survey activities shall continue to be of high quality,—since quality is essential to permanent value—and as useful in the public service and in the advancement of geologic and engineering science as we can make them. We hope that our ideals will continue to be what we hope they are now, sane and practical ideals; that we shall not dissipate energy pursuing perhaps temporarily attractive, but impracticable dreams. . . . We shall hope . . . to continue to devote our energies to the advancement of useful knowledge and the permanent welfare of our fellow citizens through our scientific and engineering services."

The changing national climate, however, made achievement of these goals difficult. Mendenhall was faced with a succession of events for the next twelve years that tested his abilities and determination to the limit.

With Secretary Wilbur's assistance, he had initiated a program as Chief Geologist with what was then regarded as adequate funding, "for fundamental research in geologic sciences." But financial constraints during the years of the Great Depression not only put an end to this enlarged program, but resulted in progressively decreased appropriations that required curtailment of staff and fieldwork, as well as other drastic economies. The Survey's appropriations, during the years from 1932 to 1935, were cut almost in half.

Mendenhall continued as Director after the change in administration that resulted from the election of Franklin Roosevelt to succeed Herbert Hoover as President. The Survey Directorship had been regarded as nonpolitical from the beginning, even though the position was a Presidential appointment sub-

ject to Senate confirmation. All but King, the first Director, who served only two years, had served under both Republican and Democratic administrations. Efforts were made to replace Mendenhall, when the new President was inaugurated, but these happily failed, at least partly as a result of the support volunteered on his behalf. C. K. Leith and Isaiah Bowman, both members of the Academy, were especially active in the representations that were made. One of the expressions of support, made by a midwestern university professor, was typical of the regard in which he was held; it was addressed to the newly appointed Secretary of the Interior Harold L. Ickes:

". . . an unsolicited expression of the exceptional regard in which . . . Dr. Mendenhall is held by his associates in the geological profession. In my own experience I have known no man in whom personal ambition was so completely subordinated to devotion to the public welfare or in whom sound judgment, fairness, complete honesty and kindliness were so combined with technical knowledge and administrative capacity of the highest order."

In addition to this very personal problem, the depression seriously affected planning for the Sixteenth International Geological Congress. Mendenhall had been selected to serve as General Secretary of the Congress, which was originally planned to be held in Washington in 1932, and which was to be preceded and followed by an extensive series of excursions to all parts of the country. Traditionally, these quadrennial International Congresses were substantially subsidized by the host government. But the United States Congress did not make funds available, and Mendenhall was forced to postpone the sessions until 1933 to provide opportunity to seek financial support from other sources, especially the Geological Society of America. But in spite of all this, the gathering, under his leadership, was successfully held, and was attended by a large and distinguished group of geologists from all over the world.

Finally, the increasing tensions in Europe culminating in the entry of the United States into World War II in 1941, progressively affected the normal work of the Survey. Beginning as early as 1939, the mapping, water, and mineral resource activities were more and more oriented towards national defense matters. In spite of his Quaker background and beliefs, Mendenhall wholeheartedly supported this shift in emphasis as one that was required by a public agency. In a congressional hearing during this period he affirmed that, "The effort of every individual and of every agency must be thrown completely into the war effort."

The transition from peacetime to war work was successfully accomplished largely through Mendenhall's effective and loyalty-inspiring leadership. The U.S. Geological Survey's contribution to the war effort was substantial. The degree to which he was personally responsible for this performance was recognized by two Presidential extensions as Director after he reached the normal retirement age of seventy.

For the more than fourteen years after retirement Mendenhall lived quietly at his home in Chevy Chase, Maryland, near the Chevy Chase Club where he enjoyed golf games with his old friends. A major disappointment during this time was caused by a fire in his home that destroyed material he had accumulated on the history of the early exploratory surveys of the West. He had planned to prepare an account of this history, for which he would have been ideally qualified. In fact, he had started to develop the subject in his presidential address before the Geological Society of America. He concluded that address with a statement that reflected his dedication to the science of geology:

". . . it seems to me that geology in developing to its present full stature has come to fill that desirable dual role, of a rich culture and a very practical science. Cultivated for its own sake, it is one of the finest of disciplines, which opens to its

disciples vast concepts of time and process, and eons of pre-human history, leading back toward remote and fascinating beginnings of things on earth. Practically applied, it is one of the most useful of sciences, because the materials with which it deals include a large proportion of those things derived from the earth, out of which our civilizations are builded. Mankind in a century or more has obtained glimpses of its value in both fields, but who can doubt that, measured by what the future has in store, they will prove to have been glimpses only."

Mendenhall was a member of many scientific and professional societies, including the National Academy of Sciences (to which he was elected in 1932), the Geological Society of America (president in 1936), the American Institute of Mining and Metallurgical Engineers and the American Association of Petroleum Geologists (in both of which he held Honorary Memberships).

Among his honors were Honorary Sc.Ds from the Colorado School of Mines in 1928 and University of Wisconsin in 1932. He received the Penrose Medal of the Society of Economic Geologists in 1944.

Mendenhall was survived by his widow, Alice M. Boutell Mendenhall, whom he married on September 20, 1915, and two daughters, Margaret Boutell Smith and Alice Curran Mendenhall.

I have drawn extensively on two memorials prepared by contemporaries of Mendenhall, which were written shortly after his death. It is perhaps appropriate to close this account with the summary appraisals made by each of them. D. F. Hewett, writing in *Science* (vol. 126, pp. 603–04, September 27, 1957) observed, "In the science of geology, where progress depends on myriad observations, . . . Mendenhall approved of discussion but disliked arguments. Quite unemotional himself, he was suspicious of fervor. Many who knew him well agree that one of his outstanding qualities was integrity in thought

and action and none who knew him ever suspected him of having a selfish purpose." M. M. Leighton (*Bulletin of the American Association of Petroleum Geologists,* vol. 42, pp. 682–95, March, 1958) wrote, "He prized humility for himself, yet with it came distinction."

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KEY TO ABBREVIATIONS

Geol. Soc. Am. Bull. = Geological Society of America Bulletin
Natl. Geogr. Mag. = National Geographic Magazine
Sci. Mon. = Science Monthly
U.S. Geol. Surv. Bull. = U.S. Geological Survey Bulletin
U.S. Geol. Surv. Prof. Pap. = U.S. Geological Survey Professional Paper
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