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#### AMENDMENT TO CONSTITUTION

The Secretary announced that the transmitted ballots on the proposed changes in Article VI of the Constitution, as canvassed by the Council, showed an affirmative vote in excess of three-fourths of the total membership of the Society, and were therefore adopted as follows:

Change Article VI, Meetings, section I, by dropping the matter in italics in the following quotation:

I. "The Society shall hold at least *two* stated meetings a year—a *summer meeting at the same locality and during the same week as the annual meeting of the American Association for the Advancement of Science—and a winter meeting*. The date and place of the winter meeting shall be fixed by the Council, and announced *by circular* each year within *a* month after the adjournment of the *summer* meeting." . . .

And by making insertions so that the section shall read as follows:

I. The Society shall hold at least one stated meeting a year, in the winter season. The date and place of the winter meeting shall be fixed by the Council, and announced each year within three months after the adjournment of the preceding winter meeting.

The President called for the necrology, and memoirs of deceased Fellows were presented as follows:

#### MEMOIR OF GEORGE H. ELDRIDGE\*

BY WHITMAN CROSS

In the death of George Homans Eldridge, which occurred on June 29, 1905, at Washington, D. C., American geology lost one of its most enthu-

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\* This memoir was not read, on account of the author's absence, but is here inserted in its proper place.

siastic and devoted workers. Those who were fortunate enough to know him mourn his untimely end, both because of the promise, which can not now be fulfilled, of further important contributions to knowledge and of the loss of a friend of singularly attractive and lovable personality. Eldridge possessed many traits worthy of all admiration, and it is befitting to place in the records of this Society a tribute to his memory, both as a geologist and as a man.

The subject of this sketch was born in Yarmouth, Massachusetts, December 25, 1854, the son of Ellery and Sarah (Matthews) Eldridge. His early education was first in the public schools of Yarmouth and later in the Boston Latin School, whence he went to Harvard University, graduating in the class of 1876.

There is nothing in the statements I have seen concerning Eldridge's boyhood to indicate a special predilection for scientific studies; but it is of record that he was greatly interested in the military training given to the Latin School pupils, and he rose from the ranks of the cadets to become lieutenant colonel at graduation. This love of the military work and discipline led him to organize a company of Harvard students, of which he became captain. There can be no question in the minds of all who have known Eldridge's energy and persistence that the boys under his command got a good insight into the meaning of military discipline, and that they received a training that was good for them.

Not long after graduation from Harvard the estate left by Eldridge's father became much involved, through no fault of his, and he resorted to teaching as a means of support. He was first located at Mount Vernon, New Hampshire (1876-1877), and for two years (1877-1879) at Nahant, Massachusetts, as principal of the High school. While at Nahant he passed examinations qualifying him to teach in the Boston Latin and other high grade schools of the Boston system, but at this point circumstances transpired which turned him to his life work in geology.

While it does not appear that Eldridge had specialized in geology in his university studies, he had availed himself of the opportunity afforded by the summer school of geology conducted by Professor Shaler at Cumberland Gap, Kentucky, in connection with the State Geological Survey. Eldridge was a member of that school, both in 1875 and 1876. A general fondness for natural science may be inferred from the courses of public lectures given at Nahant, and that the trend of his interest had been turned toward geology is shown by the fact that, while teaching at Nahant, Eldridge was taking private instruction in geology from Professor Shaler.

The opportunity to take up the profession of geologist came through the demand for young men to study the mining industry of the country in connection with the Tenth Census. That undertaking was placed in charge of the newly formed U. S. Geological Survey, and the study of the iron and coal industries was assigned to Professor Raphael Pumpelly. He applied to Professor Shaler to recommend assistants. Eldridge was one of those chosen, and in the summer of 1879 he entered upon that work. He was assigned to study the deposits of the baser metals in the southern Appalachian region and also the coal fields of northern Montana. The results of this work were published in the Census report, as cited in the appended bibliography (1, 2).

About the time that the Census work was completed the Northern Transcontinental Survey was organized to examine the mineral resources along the route of the Northern Pacific railroad. This survey was placed in charge of Professor Pumpelly, and Eldridge was naturally one of the first to be employed. He was engaged in this work for about four years, studying especially the coal fields of Dakota and Montana. Owing to the abandonment of the Survey in 1884, much of Eldridge's scientific work of this period never came to publication. The discussion of Montana coal fields in the reports of the Tenth Census embodied much of this information.

From the summer of 1884 until his death Eldridge was connected with the U. S. Geological Survey. For the first six years of this period his field of work was in Colorado, as assistant to S. F. Emmons. It was as his colleague during these happy years that the writer of this sketch came to know Eldridge and to love him for his many noble and attractive traits of character.

The principal results of Eldridge's Colorado work, under Mr Emmons, appear in the Anthracite-Crested Butte folio (10); in the monograph on the Geology of the Denver basin (15), and in a sketch of the complex stratigraphy and structure of the foothill belt about Golden (6).

The study of the Cretaceous in Colorado and Montana led Eldridge to propose the union of the Fort Pierre and Fox Hills as the Montana formation or group (5).

In 1890 Eldridge investigated the first productive oil field of the western Cretaceous at Florence, in Colorado, and wrote an account which has served to direct the work of development in that interesting field (?).

In 1891 Eldridge was given independent work, and his first assignment was to the investigation of the phosphate deposits of Florida. That this study was never completed was not the fault of the geologist; the exigencies of Survey work led to his repeated assignment to investigations

deemed of more urgent importance. With each postponement of this study the amount of development in the phosphate area increased greatly, so that the field work was never completed. In fact, the last visit to the Florida phosphate diggings was made by Eldridge only a few months before his death. A preliminary report was published in 1893, giving a summary of his observations to that time (8).

The great energy and endurance possessed by Eldridge, as well as his ability to grasp the broad features of geology in a new country, led to several assignments in reconnaissance work. In the seasons of 1893 and 1894 he was engaged in surveys of this character in northwestern Wyoming and northeastern Idaho. Two valuable reports were the results of this work (11 and 12).

Again, in 1898, with the beginning of Alaskan exploration by the Geological Survey, Eldridge was called on for genuine reconnaissance work. He was placed in charge of the work of several parties, and himself conducted one of them through a wild and quite unknown territory north of Cooks inlet, within which is Mount McKinley, the highest point in North America. It is believed by his friends that the exposure and strenuous exertions of this season's work seriously impaired Eldridge's vitality. It was too much for a man of 44 years to undergo without lasting injury. His reports appear in the Survey publications cited in the bibliographic list (16 and 17).

In the summer of 1899 Eldridge was assigned to the comprehensive study of the asphalt and bituminous rock deposits of the country. His investigations were carried on in many states and concerned deposits of various characters. The field work occupied more than a year's time and the report is really a monographic discussion of a class of deposits which had previously received scarcely any attention. This is probably the most important single contribution to science made by Eldridge (18).

Soon after the completion of the asphalt report the investigation of important oil fields in southern California, in a region of much structural complexity, became a matter of great interest, and it was entrusted to Eldridge. After a vast amount of labor, which was rendered doubly difficult by the rapid development of the oil fields, he had nearly completed his report on some important sections of the district when attacked by his last illness. It is to be hoped that some part of the material may appear under the name of the man whose career has unhappily been cut short before he could complete his work. A preliminary statement concerning the field was issued in 1903 (21).

The last fruit of Eldridge's wide experience was dictated from his bed of suffering not long before the end. It was a summary of his views

regarding the origin of vein asphalt, one of the singular phenomena investigated some few years ago (22).

The illness which terminated this career, with its promise of still higher achievements, seems to have begun in the autumn of 1904. After several months of uncertainty as to its nature, it became evident that an operation was necessary to remove an internal growth of problematic character. The relief afforded by the operation was not lasting, and with the renewal of the sarcomatous growth the end was inevitable. Almost to the last the patient exhibited his customary cheery courage and had faith in his ultimate recovery.

The scientific work accomplished by Eldridge was of the highest order in many respects. He was not much given to theorizing, choosing to stick close to the firm ground of established fact. His investigations were characterized by thoroughness and by infinite patience in the accumulation of facts bearing on his problem. His aim seemed to be to exhaust the subject so far as time and conditions would permit. To ascertain and make known the exact truth was his ambition. As a result of fidelity to this high ideal, he gathered a vast store of information in each of his more important investigations, and in that it was not granted him to utilize a great part of this knowledge to the full, in mature and well considered discussion, must be a source of keen and lasting regret.

While an adequate tribute to the estimable personality possessed by Eldridge, such as his friends may desire to see put on record, is perhaps not in place in this publication, this sketch would be far from satisfactory without some appreciative notice of the traits which endeared our friend to all who were privileged to know him. His was a character such as all admire, and to know the possessor was to love him; blessed with a fine physique and great strength, Eldridge seemed always in high spirits and overflowing with good cheer. The power to brighten with his presence was felt by all with whom he came in daily contact, and among all ranks of the great organization to which he belonged his death caused the feeling of personal loss, even to many who could not claim direct acquaintance. A fund of anecdote in illustration of this influence for good might be cited.

For many years physical strength and great power of endurance stood Eldridge in good stead in trying circumstances. Professor Pumpelly tells in a personal letter how, during his work for the Transcontinental Survey in Montana, Eldridge rose from his bed after a severe attack of typhoid fever, and, in spite of his physician's orders, proceeded with the task assigned him to find and explore certain coal beds in an undeveloped district. It was early winter and severe snow-storms had driven out rail-

road surveyors and others, who told Eldridge that the locality he sought to reach was inaccessible; but he continued his journey, found the coal buried under heavy snow-drifts, opened and sampled it, and returned in safety. In the writer's own experience with Eldridge in the field, there have been many illustrations of his phenomenal endurance and grim determination—a combination of qualities making it a hopeless task for one of average powers to compete with him in many undertakings. When engaged in the preparation of reports Eldridge has been known to work without sleep for nearly 48 hours and seem to suffer no ill effects.

A good comrade and loyal friend, Eldridge was also a beautiful example of the devoted son. His aged and infirm mother found with him during her declining years a home of many comforts, such as could be supplied only by cheerful sacrifices. Soon after the death of his mother Eldridge was married to Miss Jessie Newlands, of San Francisco, who survives him.

Eldridge was a man of much modesty, never putting himself forward except as a duty. His ideals were those of the Christian gentleman, and hence his influence for good was always felt by those within his sphere of life. Many will join in the tribute of his old instructor and friend, the late Professor Shaler, who wrote of him:

“He will remain with me as the type of the strong, well-balanced man; brave, steadfast, patient in his duties, ever friendly with his neighbor, helpful with his friends—I feel that my contacts with him served to ennoble my life.”

#### LIST OF PUBLICATIONS

- (1) Montana coal-fields. Tenth Census of the United States, 1879-1880, vol. xv, 1886, pp. 739-757.
- (2) The industries of the base metals (lead, zinc, and copper) in the census year. Tenth Census of the United States, 1879-1880, vol. xv, 1886, pp. 809-830.
- (3) On some stratigraphic and structural relations of the country about Denver, Colorado. Mining industry (Denver, Colorado), vol. iii, no. 3, 1888, pp. 24-25; no. 4, pp. 33-35; no. 5, pp. 44-45.
- (4) On some stratigraphical and structural features of the country about Denver, Colorado. Proceedings of the Colorado Scientific Society, vol. iii, 1888, pp. 86-118.
- (5) Some suggestions upon the method of grouping the formations of the Middle Cretaceous and the employment of an additional term in its nomenclature. American Journal of Science, vol. xxxviii, October, 1889, pp. 313-321.
- (6) On certain peculiar structural features in the foothill region of the Rocky mountains near Denver, Colorado. Bulletin of the Philosophical Society of Washington, vol. xi, 1892, pp. 247-274.

- (7) The Florence oil field, Colorado. American Institute of Mining Engineers Transactions, vol. xx, 1892, pp. 442-462.
- (8) A preliminary sketch of the phosphates of Florida. American Institute of Mining Engineers Transactions, vol. xxi, 1893, pp. 196-231.
- (9) Artesian wells of eastern Dakota. Comptes Rendu, International Congress of Geologists, 5th session, 1893, p. 318.
- (10) Anthracite-Crested Butte folio, Colorado (in conjunction with S. F. Emmons and C. Whitman Cross). Geologic Atlas of the United States, folio 9, U. S. Geological Survey, 1894.
- (11) A geological reconnaissance in northwest Wyoming. Bulletin no. 119, U. S. Geological Survey, 1894, pp. 72.
- (12) A geological reconnaissance across Idaho. 16th Annual Report, U. S. Geological Survey, pt. 2, 1895, pp. 211-276.
- (13) Occurrence of uintaite in Utah. Science, new series, vol. iii, 1896, pp. 830-832.
- (14) The uintaite (gilsonite) deposits of Utah. 17th Annual Report, U. S. Geological Survey, pt. 1, 1896, pp. 909-949.
- (15) Geology of the Denver basin in Colorado (in conjunction with S. F. Emmons and C. Whitman Cross). Monograph no. 27, U. S. Geological Survey, 1896, pp. 556.
- (16) Report of the Sushitna expedition (in conjunction with Robert Muldrow); the extreme southeastern coast; the coast from Lynn canal to Prince William sound; the Sushitna drainage area; maps and descriptions of routes of exploration in Alaska in 1898, with general information concerning the territory. Special Publication of the U. S. Geological Survey, 1899, pp. 15-27, 101-102, 103-104, 111-112.
- (17) A reconnaissance in the Sushitna basin and adjacent territory, Alaska, in 1898. 20th Annual Report, U. S. Geological Survey, pt. 7, 1900, pp. 7-29.
- (18) The asphalt and bituminous rock deposits of the United States. 22d Annual Report, U. S. Geological Survey, pt. 1, 1901, pp. 209-464.
- (19) The petroleum industry of California. Engineering and Mining Journal, vol. 73, 1902, p. 41.
- (20) Origin and distribution of asphalt and bituminous rock deposits in the United States. Bulletin no. 213, U. S. Geological Survey, 1903, pp. 296-305.
- (21) The petroleum fields of California. Bulletin no. 213, U. S. Geological Survey, 1903, pp. 306-321.
- (22) The formation of asphalt veins. Economic Geology, vol. 1, no. 5, March-April, 1906.

*MEMOIR OF ALBERT ALLEN WRIGHT*

BY FRANK A. WILDER

Albert Allen Wright, a Fellow of this Society since 1893, died at Oberlin, Ohio, on April 2, 1905, after an illness of a single day. While his health had been somewhat impaired for some time before his death, he was not greatly hindered in his activities as a teacher and investigator till the day before his death.