

purposes of the section exists it is inconceivable that it will occupy a position of any importance in the minds of engineers. Unless, therefore, its characteristics can be so modified that it occupies a place among its sister organizations that is unique, it has no justification for continued existence.

As has already been explained, the engineer is concerned with the adaptation of existing knowledge to the needs of the constructive arts; while the fundamental scientist is concerned with the advancement of learning through scientific research, and is rarely interested in the practical application of the results of his work. Because of the nature of their professional duties very few engineers find the time or the opportunity to keep abreast of the advances in abstract knowledge after the completion of their formal training, and, as a consequence, they are unacquainted with, if not positively indifferent to, the newer developments in science that might revolutionize their own work if these developments could be quickly assimilated and adapted to use.

There is, then, an opportunity for Section M to occupy a place of peculiar usefulness as the common meeting ground of the creators of scientific knowledge and of those who adapt such knowledge to the use and benefit of mankind. I would, therefore, suggest that a serious effort be made to so modify the aims of the section that it will effectively promote the association of scientists and engineers, and enable the latter to voice his scientific needs and his achievements in adapting science to industry, and the former to attempt to forecast the possible practical applications of some new theory that has been recently developed or of a discovery which, if it can be made useful, will be revolutionary in its character. I recognize the difficulties that are inherent to this plan but I hope that they may be overcome. Under such an arrangement it would seem to me that the programs for the section meetings might very properly include papers presented by representatives of the different divisions of engineering that will present the latest applications of scientific knowledge in each of these divisions, and by the exponents of the fundamental sciences that will present and interpret the possible applications of the latest discoveries in the several sciences. The advantages of such programs would seem to be obvious for, as has already been explained, the older societies are generally more concerned with the technique of engineering than with its theoretical or fundamental scientific basis.

In addition to programs for the meetings of Section M, such as I have just described, it would seem desirable that the American Association for the Advancement of Science foster the publication of a journal that will endeavor to present in a popular form the

latest scientific data and discoveries with suggestions of their possible applications, so that engineers and those who are responsible for the management of our industries may more quickly than formerly have access to and utilize such information.

If, therefore, Section M can in some manner establish a bond of interest and sympathy between engineers and scientists so that the former will become more scientific and the latter more practical, the future of the section will become secure.

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EUGENE ALLEN SMITH

EUGENE ALLEN SMITH became State geologist of Alabama on April 18, 1873, and served continuously in that capacity until his death on September 7, of this year, or more than fifty-four years' service. Michael Tuomey was the first State geologist, appointed to the place when the State Legislature of 1847-48 created the department, with final approval on January 4, 1848. However, from the results accomplished by the Smith survey, it would seem that Eugene Allen Smith was also the Geological Survey of Alabama. He did not write all its reports, but he certainly dominated the entire program and policy of the survey. He published some very long and detailed accounts of Alabama's natural resources, to which almost all of his writings were confined, but most of his contributions were in the form of short and concise accounts, rather than exhaustive monographs. Furthermore, his writings cover a wide variety of subjects from the oldest rocks in the crystalline area to the recent sands at the seashore; from the metals to clays and sulphur; from agriculture to gold mining. In addition to his writings which found their way into print, he must have issued thousands of volumes in the form of letters and reports. No matter how unimportant the sample or the inquiry, it was his habit of sending back a courteous and complete reply. The office is filled with a tremendous mass of correspondence, including many volumes of copies made by presses in the days before carbon paper and the typewriter.

Eugene Allen Smith was born at Washington, Autauga County, Alabama, October 27, 1841, the son of Samuel Parrish and Adelaide Julia (Allen) Smith. On his mother's side his ancestry is traceable back to Governor William Bradford through Allyns, Phelps, Bishop, Fitch, Walcott and others. He attended the private school at Prattville and entered the public schools of Philadelphia at the age of 11. His work in the Philadelphia schools was a great inspiration to him, and in his own words: "I read

three or four pages of Latin each day just because my instructor liked for me to do so." It was also in Philadelphia that he composed and edited "The Half-Yankee Boy," several copies of which have been preserved. This interesting newspaper consisted of a double sheet or four pages, filled with excerpts from various sources, and on a wide variety of subjects. These were carefully lettered in ink and comprise one of the many clever and original ideas which filled his life. It was during this period between the Prattville schools and college that he developed a passion for carving. He used a penknife with amazing dexterity, as is attested to by the numerous articles left in his personal effects. Perhaps his most beautiful work was done on peach seeds, while some very nice things were done in wood. His designs were original and artistic, and the craftsmanship inspired.

At the age of nineteen he entered the junior class at the University of Alabama, where he received the A.B. degree in 1862. In April of that year all of the members of his class were sent to various parts of the state as instructors for drilling recruits. He was sent to Greenville and enlisted in Company K, the company which he was drilling, as a private. He was later elected a second lieutenant in this company, and was later detailed by President Davis as state captain and instructor in tactics at the University of Alabama. He served in this capacity from December, 1862, until April, 1865. Somehow the war and its heavy blow to the South had not entirely upset his life and plans, and he managed to go to Germany in October, 1865, to continue his studies. He spent a few months at the University of Berlin, a similar period at Göttingen and then went to Heidelberg. From the latter university he received the degrees of master of arts and doctor of philosophy *summa cum laude*, in 1868. While in Europe he spent his summers in travel, and, as would be expected, allowed the art galleries to consume a good bit of that time. Usually on these jaunts he was accompanied by some of his fellow students, "not because of their interest, but because they were on allowances also!"

Upon his return to America in December, 1868, he went to the University of Mississippi as assistant professor of chemistry, and was associated with the geological survey of the state, which was under the charge of Eugene Woldemar Hilgard. There can be no doubt but that Hilgard instilled in him much of his interest in geology. His first work was embodied in his report on the Mississippi bottoms. He remained at the University of Mississippi until May, 1871, when he was elected professor of chemistry and mineralogy in the University of Alabama. He was instructed by the trustees of the university to spend

such time as was not required by his duties as a professor in the university to the study of the natural resources of the state, which he did at his own expense. It might be said in passing that the University of Alabama has always taken the lead in this important work.

In 1873 the Legislature passed an act "To revive and complete the Geological and Agricultural Survey of Alabama," and made a special appropriation of \$2,200 for the purchase of an ambulance, team and other equipment. In addition to this, the sum of \$800 was appropriated for chemical apparatus for the analysis of soil and ores, and \$500 annually for a period of ten years for the expenses of the survey. Eugene A. Smith was appointed state geologist, to receive no compensation since his salary as a professor in the university was regarded as being sufficient remuneration for the added duties. During this decade he was assisted by Henry McCalley, of Huntsville, who gave his services to the work of the survey gratuitously. Much of the state was visited, and the results incorporated in the rather detailed reports of progress, and many shorter contributions which were published in various scientific journals.

He devoted the first part of this period to the metamorphic region, studying the formations at that time thought to be Pre-Cambrian. Later, he gave considerable attention to the coal and iron regions of the present Birmingham district, calling attention for the first time to the vast areas underlain by coal. The brown ores of Bibb, Shelby, Talladega and Calhoun Counties received all the consideration given iron ores since red ores were regarded as too low grade to be used as a source of iron. During the latter part of this decade, he was appointed special agent in the division devoted to cotton culture, for the 1880 census. This work carried him into the Coastal Plain country for his first intimate glimpse of the wonderful sections along the Alabama and Tombigbee Rivers. In addition to his reports for the census, he published his very fine and comprehensive "Report for 1881-82, embracing an account of the agricultural features of the State." All this had been accomplished on an appropriation of \$500 annually!

In 1883 the wonderful work of the survey prompted the legislature to increase the annual appropriation to \$5,000. This made it possible to do more efficient work, and to accomplish even greater results. McCalley was given general charge of the Warrior Coal Field, while Smith delved into the problems of the younger formations of the state, a work which perhaps gave him his greatest accomplishment and certainly his greatest enjoyment. Many field seasons were spent in the Coastal Plain region, and several reports record the results.

In 1891 the annual appropriation of the survey was increased to \$7,500 and the work continued to enlarge and expand, and grow in importance. Reports appeared more frequently and on a greater variety of subjects. Smith had a large and important share in all this work, besides being charged with all administrative duties. With the natural enlargement of the work, the legislature in 1919 increased the annual appropriation to \$12,600, where it remained until his death. His fast increasing duties as state geologist made it necessary for him to give up his work in the university in 1913, and he was made professor emeritus, and subsequently devoted all his energies to the work of the survey. For the first time in 1906 the state gave financial support to the state geologist, and \$1,500 was designated as his salary. This was increased, over his protest, to \$4,000 in 1919. His plea was that if there was anything available, he wanted it for the survey and not for himself. As the result of his final request of the legislature, the annual appropriation was increased to \$50,000, and his survey was assured of adequate support for the first time in its history. The final passage of this bill was recorded during the first day of his fatal illness, but he had full knowledge of its successful voyage through the law-making channels.

His quarters at the University had evolved from a small laboratory in the basement of Wood's Hall, and later the lower floor of Garland Hall, to the handsome building which bears his name. This structure was completed in 1910, and houses the survey and the museum, with the departments of geology and biology occupying parts of the wings. He made the building and its surroundings the beauty spot of the campus, using his full knowledge of flowers and shrubbery to the very best advantage. Thus in the midst of an environment his very own, he was stricken on August 29 while at the breakfast table with an internal malady and had to be taken to the hospital for an immediate operation. The operation was successful, but his vitality was too low to allow him to recover from the shock. He succumbed at 4:30 P. M., on September 7, and was buried the following afternoon.

He was a life member of the American Association for the Advancement of Science, and was vice-president and chairman of Section E (Geology) in 1904 and elected again in 1926, which he declined because of his age. He was appointed honorary commissioner at the Paris Exposition in 1878; was a member of the council of the Geological Society of America from 1892-95, vice-president in 1906 and president in 1913; was honorary life-member of the American Institute

of Mining and Metallurgical Engineers and received numerous other honors during his long and colorful career. Perhaps one of the greatest honors and distinctions came from the law makers of his own state, when he was named specifically in the statutes as state geologist. His resignation could only have been received by the State Legislature.

He always took an active interest in all of the affairs of the university, appearing at all its functions, especially the athletic contests. He would never go into enemy territory to a football game, saying "there is trouble enough at home without going away to hunt for it!" He enjoyed most the baseball games in which there was an abundance of base hits. The university loses one of its most loyal friends.

His bibliography carries more than 120 entries, which comprise about 5,000 pages, with hundreds of maps and illustrations. His contributions have been as valuable as voluminous, and his further achievement in directing the complicated affairs of the survey in such a way as to keep it intact for more than half a century and amply providing for its future constitutes an accomplishment which stands on its own merits.

The phenomenal development of the mineral industries of Alabama, which accompanied the progress of the work of the survey, must have given him a great deal of pleasure and satisfaction, but he never gave voice to any such emotion. The annual production of coal had gone from almost nothing to over 20,000,000 tons. Industrial plants emerged from the hillsides like mushrooms, and great mines and quarries were everywhere. He was directly responsible for the location of the cement plant at Spocari, near Demopolis, and he and Watt T. Brown brought about the establishment of the Ragland plant. These proved that cement could be successfully made in Alabama, and the growth of this industry has been remarkable. Surely his reward was in watching this progress in the development of the state he loved and for which he had devoted his life, without ever a thought of himself. He died, poor in this world's goods, but rich in its honor. His achievements had won for him the love and respect of all who knew him. His simple and beautiful life, his modesty and genial nature endeared him to his associates as "The Little Doctor." He had outlived all his contemporaries, passing from this life with the full knowledge that he had done everything he could for his work and for the state.

WALTER B. JONES,
State Geologist

ALABAMA