spirit that guided some of our older clinicians who never wasted their time in laboring for things beyond their reach, but who carefully and minutely studied every perceptible evidence that lay within the ken of their senses.

I have been led to offer these criticisms on a tendency in American medicine because a common complaint from physicians is their want of laboratory facilities. Often they are heard to talk as if their professional happiness would be complete if they had at their command an ample laboratory with abundant technical service. Such complaints are due to a want of cultivation of the seeing eye and sensible fingers. The exercise of intelligent clinical observation should be to a physician the most fruitful source of intellectual satisfaction. In this kind of work he can always gather new knowledge by employing originality, and he must be original to do it. Such work is more satisfying than to repeat tests which have been devised by the originality of others. A photographer derives some pleasure from a photographic reproduction of a painted picture, but how inferior is such pleasure compared with that of the original painter. When a complaining doctor leans too heavily on laboratory support for comfort in his practice, it probably means that he has failed to strengthen the powers that lie within his grasp. When by his perspicacity a doctor makes a diagnosis of an obscure case he has a glint of the same divine fire that lit the mind of Democritus when he said, "Rather would I explain the cause of a single fact than become king of the Persians."

OBITUARY

THE SCIENTIFIC WORK OF ETIENNE S. BIELER

BEFORE me are some original papers on a variety of scientific subjects published in British, Canadian and American journals—a noteworthy contribution from the pen of a deeply mourned friend and colleague cut off in the prime of his scientific activity and production. Etienne Bieler gave early proof in the advanced mathematical classes at McGill of a singularly lucid and penetrating mind and a power of concentration which his teachers felt assured would place him in the front rank of scientific men of his time. He was marked out for a career of distinction in the field of physics, and during his final years of study in Montreal covered a consistently broader range of studies than is usual. The writer well remembers in the spring of 1915 Bieler's announcing his decision to enlist in the McGill University Company, and immediately afterwards commencing to write a difficult examination in applied mathematics, in which he took brilliant marks. Returning invalided from France in 1919, he joined the postgraduate classes with a view to proceeding to his M.Sc. degree—a part of the work being taken in electrical engineering, in order to add a certain amount of breadth to a future career in pure science.

A class problem was the source of Dr. Bieler's first published paper. At that time methods had been successfully worked out in Great Britain for detecting submarines by their disturbance of the earth's magnetic field reacting on a loop of submarine cable. The complete solution of this problem was at a later date written up and communicated to Sir William Bragg, for use of the Admiralty. It was later released for publication and published in *Proceedings* of the Royal Society.[1]

[1] October, 1921.

It is impossible in a short article to do more than select a few papers describing Bieler's most important contributions to science. Passing over a short paper on the "Measurement of Small Capacities" (1921), giving in abstract the results of a highly creditable thesis on the distribution of electric potential across the suspension insulators used in high voltage lines, I turn to a paper published in the *Transactions* of the Royal Society of London (1924), dealing with the scattering of α-particles by light atomic nuclei. It is now well known as a result of Sir Ernest Rutherford's investigations that an atom consists of a central nucleus carrying a positive electrical charge about which are rotating a greater or lesser number of electrons or ultimate electrical particles of negative electricity. On arriving at the Cavendish Laboratory as 1851 exhibitioner, Bieler was assigned the task of investigating the nature of the electric fields in the neighborhood of nuclei of light atoms such as aluminum and magnesium. The experiment consists in firing α-particles (positively charged helium atom) from radium into a thin screen of the metal to be investigated. The deviation of α-particles passing at various distances from the atomic nuclei may be detected by the scintillations which are produced in a zinc-sulphide screen. The experiments are exceedingly laborious, as scintillation counts can not be made otherwise than by the naked eye, which must be rested at frequent intervals to be able to detect the faint effects observed. The theoretical aspect of the subject is considered in a page published in the *Proceedings* of the Cambridge Philosophical Society (1923), and there is evidence of high and mature mathematical power on the part of the author. The final result shows that the nature of the nuclear field begins to deviate from the "inverse square law" at a distance of 10^{-13} centimeters. The scientific results

we have just described are often quoted in the literature of the atom as a tribute to the fundamental nature of the work.

On returning to McGill as assistant professor, Bieler continued his work along similar lines, but was greatly handicapped by the lack of a suitable supply of radium, curiously enough in the very laboratory where its essential properties were first discovered. He then turned his attention to magnetism, and in preparation for an attack on the experimental side of the subject published a critical survey of the subject in the *Journal* of the Franklin Institute (1927). In collaboration with Mr. C. T. Lane, the technique for obtaining samples of extremely pure substances was developed, and the determinations made in the McGill laboratories are now quoted as among the most reliable.

In the summer of 1927 Bieler developed, in collaboration with Mr. H. G. I. Watson, a new method for geophysical prospecting which was successfully applied in the mining districts of northern Quebec. A brief account of his work is published in the *Canadian Mining and Metallurgical Bulletin* (1928), just before the author left to take charge, under the auspices of the Australian government, of an extensive program of work planned to locate, if possible, new mineral deposits. There is no doubt but that, had Bieler lived, he would have been among the foremost world authorities in this field. An appreciation of his work in England and in Australia by his coworkers there, will, it is to be hoped, appear in another issue.

He died at Geraldton, western Australia, on July 25, 1929, after a brief illness of acute pneumonia.

I have spoken only of Bieler's scientific work. He was equally at home in writing and speaking French and English, and it has several times been my privilege to hear, among a group of friends interested in literature and music, articles from Bieler which testify to a vivid imagination, an extensive vocabulary and an inside knowledge of the works of literary men.

L. V. KING

MCGILL UNIVERSITY

HENRY CHAPMAN MERCER

DR. HENRY CHAPMAN MERCER, an archeologist and ethnologist of international reputation, died at Doylestown, Pennsylvania, on Sunday, March 9. Many generous bequests of scientific interest were made in his will. The famous Mercer Museum, erected and maintained by Dr. Mercer for the Bucks County Historical Society, has been bequeathed to that society and endowed with a maintenance fund of $130,000. The Mercer Museum contains a historical collection, which is internationally famous, of some twenty thousand ethnological tools and implements of the pioneer settlers of America. Fonthill, Dr. Mercer's incomparable home, is bequeathed to the public for a museum, and the beautiful grounds surrounding it are given to the Doylestown Nature Club as an arboretum, both bequests to be maintained by an endowment fund of $100,000. Another $100,000 bequest is made in memory of his uncle, Timothy Bigelow Lawrence, to Rudolf P. Hommell, Lehigh University, who now is conducting an expedition in the Far East for the collection of utensils employed in the daily life of the inhabitants.

Dr. Mercer was never married. He was born in Doylestown, Pennsylvania, on June 24, 1856. In 1879 he was graduated from Harvard with the degree of A.B. Dr. Mercer received the honorary degree of doctor of science from Franklin and Marshall College in recognition of his archeological discoveries during his Yucatan expedition. He was granted the honorary degree of doctor of law by Lehigh University. Principal among several honors bestowed on Dr. Mercer was the award of a bronze medal by the Exposition Historico-Americano Madrid in 1892 for his "Lenape Stone."

In 1882 he was an honorary member of the United States Archeology Commission at Madrid. He became editor for anthropology in the *American Naturalist*. In 1894 he was appointed by Dr. William Pepper as curator of American and prehistoric archeology at the University of Pennsylvania and filled that position until 1897.

Dr. Mercer had contributed numerous learned papers to historical publications and published many books. Among his books are "Hill Caves of Yucatan" (1896), "Antiquity of Man in the Delaware Valley and Eastern United States" (1897) and "Ancient Carpenters' Tools" (1929).

Fonthill, which was built by Dr. Mercer in 1908 and 1909, is a unique residence entirely of concrete with beautifully groined and arched ceilings, upon the interior of which Dr. Mercer lavished his finest exhibitions of ceramic art, illustrating history and historical subjects, both ancient and modern.

Dr. Charles Conrad Abbott wrote the following ode to Dr. Mercer:

Reincarnation of the storied past,
Skyward, in majesty, thy walls arise,
In strength assuring us that they shall last;
Not crumble as the common structure dies.
Thy towers, mantled with the morning light,
Proudly acclaim the past is still alive
Where proud, grim feature, or the sorry sight,
Would have the world in soulless fashion thrive.