

eight Archæan provinces into which he divided India and Burma. Of this plan only the general discussion and about a quarter of the account had been published by 1940, and other commitments prevented the completion of further sections before his death. Thus a work that would have been of the greatest value to geologists in India has been left largely uncompleted.

In the Geological Survey of India, Fermor was promoted to the grade of superintending geologist at the early age of thirty. Though he first officiated as director in 1922, it was not until 1932 that he was substantively appointed to the post. It was unfortunate for him that his period of office coincided with a period of financial stringency in India. This compelled him to reduce the staff of his Department, and prevented him from planning the work of the Survey as he would have liked. In other directions, however, he was able to render service to India, in particular by the part he played in helping to bring into existence a national scientific academy for the whole of India at a time when conflicting interests were tending to divide scientific India. This was effected by the formation of the National Institute of Sciences of India, of which he became the first president in 1935. During the same year he was president of the Royal Asiatic Society of Bengal, while earlier he had been president of the Mining and Geological Institute of India in 1922, and general president of the Indian Science Congress in 1933. To each of these institutions he delivered original addresses that indicated the wide scope of his outlook. He was elected a Fellow of the Royal Society in 1934 and the honour of knighthood was conferred on him on the eve of his retirement after thirty-three years service.

Though he retired from official service in India in 1935, he continued to play an active part in scientific matters. Perhaps the most important of these was his visit to Malaya in 1938 to report on the mining industry of that country. This report must have proved of the greatest value when the time came to reconstruct the country after the Second World War.

On retiring to Bristol, Fermor took an active part in local scientific life, and became president of the Bristol Naturalists Society in 1945 and 1946. Finally, he was elected president of the Institution of Mining and Metallurgy for the year 1951-52, the subject of his presidential address being "The Mineral Deposits of Gondwanaland".

From the time that he first went to school until he left for India, Fermor's education cost his father little, for both at school and at college, by hard work and ability, he won scholarships that paid for his school and college fees. No doubt it was due to this that he was able throughout his life to apply himself with great concentration to the task in hand, while it may also have been responsible for the relatively spartan life that he led. In later years he mellowed, and the patience and tact that he displayed at the time of the formation of the National Institute of Sciences of India revealed to many a new aspect of his character, and won him many friends.

W. D. WEST

#### Dr. Saul Dushman

By the death of Saul Dushman on July 8, the General Electric Company of Schenectady has lost one of a small group of scientists who became world-famous and who established the scientific traditions of the Company's research laboratories—the group

which included W. D. Coolidge, Irving Langmuir and W. R. Whitney.

Dushman was born on July 12, 1883, in Rostoff, Russia, and his family migrated to Canada in 1892. They settled in Toronto, and when Saul Dushman left the high school there in 1900 he had the best scholastic record ever achieved in the province of Ontario. This won him the Prince of Wales Scholarship at the University of Toronto, where he obtained his A.B. degree in 1904 and Ph.D. in 1911. Soon afterwards he joined the Research Laboratory of the General Electric Co. and remained on its staff until his retirement thirty-seven years later. He was assistant director from 1928 until 1948.

His early work was on physico-chemical problems; but at the suggestion of Dr. Langmuir he changed over to experimental and theoretical work on thermionic emission, to which branch of physics he soon made important contributions. In 1923 he applied the theory of the vapour-pressure constant for monatomic gases to the derivation of an expression for the constant  $A_0$  of Richardson's equation, which differs only by a factor of  $\frac{1}{2}$  from the expression accepted to-day (electrons were not spinning in 1923!). On the experimental side, with various colleagues he determined the thermionic constants for a number of pure metals and also for metals covered with adsorbed layers.

This work led Dushman to take an interest in vacuum physics, an interest which persisted to the end of his life. He wrote a short book on the subject in 1922, upon which many of us were brought up, and in 1949 there appeared his monumental volume of 882 pages on the same subject. Throughout the book Dr. Dushman's wide personal experience in the field is evident, and his early interest in physical chemistry coloured his choice and treatment of various topics—as indeed it did in his work on thermionic emission. The book will long be a memorial to his encyclopædic knowledge of his subject, his enthusiasm and his desire to serve others.

His colleagues in the laboratory remember him also for his deep interest in human beings, his friendliness and, again, his desire to serve. Physicists all over the world will join with them in paying tribute to his memory.

F. A. VICK

#### Dr. K. T. Compton

KARL TAYLOR COMPTON was born on September 14, 1887, in Wooster, Ohio. He received his bachelor's and master's degrees from the College of Wooster, where his father, a Presbyterian clergyman, was dean and professor of theology. Compton spent the first part of his academic life doing research and teaching physics. He was awarded a doctorate at Princeton in 1912 and, after teaching for two years at Reed College, Oregon, returned to Princeton in 1915, where he remained until 1930, becoming chairman of the Department of Physics in 1929. His numerous papers covered a variety of physical topics, including ionization of gases, soft X-rays, spectroscopy in the extreme ultra-violet, fluorescence and dissociation of gases, electric arcs and other types of gas discharge and photoelectricity. His contributions in spectroscopy and thermionic emission were recognized by the award of the Rumford Medal of the American Academy of Arts and Sciences. In 1927