

and Italy, eventually contributing a paper on the mineralogy of Elba. He was co-author with V. Goldschmidt of Heidelberg of an elaborate memoir on the crystal morphology of the diamond, and later produced an authoritative treatise on the precious stones of Russia.

In 1912 Fersman was appointed to a professorship in mineralogy and to a curatorship of the Museum of Mineralogy attached to the Academy of Sciences. From this time his interests were to be devoted to the field of geochemistry. There were to follow during the next twenty-five years his monumental works on geochemistry, and while it is still too early to assess the value of some of the daring theoretical treatment his exuberant genius brought to the interpretation of the factual data, experimental and observational, which he had amassed, his rank as a leader of international reputation has rested on brilliant achievement over a wide field. Between the two World Wars his contributions included detailed investigations on the geochemistry of pegmatites, particularly those of granite and alkali-syenite type; researches on the geochemical migration of elements within sedimentary terrains remote from magmatic centres, and numerous other studies in regional mineralogy.

Many geological expeditions fostered by the Academy of Sciences within the vast territories of the U.S.S.R. were organized under his leadership, and he personally conducted explorations in Central Asia, the Urals and the Kola Peninsula. These investigations led to highly important economic developments, notably with the discovery of great apatite deposits of magmatic origin in Kola and of large workable deposits of sulphur in the Kara-Kum desert of Transcaspiia.

Of Fersman's many achievements, his researches on the great alkali igneous complexes of Khibin and Lovozero in the Kola region rank among the most outstanding. In the elucidation of these unique intrusions, Fersman's own studies were dominant. They have greatly widened our knowledge of the chemistry and mineralogy of alkali magmas and of the conditions controlling the peculiar sodic (agpaite) type of differentiation.

As director of the Khibin Scientific Arctic Station near Kirovsk, Fersman inspired much of the later work of his younger colleagues in the same field, and it was under their guidance that the participants in the Kola Excursion of the 1937 International Geological Congress were able to appreciate to the full the magnificent pioneer researches linked with his name.

Fersman's most important memoirs, including his works on geochemistry (four vols., 1933-37), pegmatites (1931, 1940) and other studies in regional mineralogy, are in Russian. In English, his "Scientific Study of Soviet Mineral Resources" (1935) provides a succinct account of the planning and development of the mineralogical researches in which he himself played so prominent a part.

In addition to his scientific work—he was author of some five hundred scientific books and papers—Fersman was active in public life. He had a gift for the exposition of scientific knowledge in popular form, and his artistic sense was shown in his articles about chemical elements, minerals and rocks. Member of the presidium of the Academy of Sciences, he was at one time chief editor of its scientific publications.

Fersman was the recipient of a Stalin Prize and was awarded the Order of the Red Banner of Labour by the Soviet Government. Abroad, his honours

included foreign membership of the American and British Mineralogical Societies and the award of the Wollaston Medal of the Geological Society of London in 1943.

C. E. TILLEY.

¹ *Nature*, 155, 296 (1945).

² *Nature*, 154, 814 (1944).

Sir Martin Forster, F.R.S.

THE death in Mysore City on May 24 at the age of seventy-two of Martin Onslow Forster has removed from our midst an organic chemist who, prior to 1922, was an outstanding figure in British chemistry. Forster received his early education at Dover Hill House, Margate, and having decided upon a chemical career he entered the Finsbury Technical College, where he received an excellent training under the late Prof. R. Meldola. As was customary at the time, when the opportunities for research in Britain were somewhat limited, he proceeded to Germany, where he worked at Würzburg under Prof. E. Fischer. The debt which Forster owed to him was in some measure repaid by the brilliant memorial lecture which he delivered to the Chemical Society in October 1920. Returning with his Ph.D. degree, Forster in 1894 came under the influence of Prof. H. E. Armstrong, in whose laboratory he worked as the holder of a Salters' Research Fellowship, and so arose a life-long friendship. His tenure of the fellowship was short, since in 1895 he was appointed by Sir William Tilden to a demonstratorship in chemistry at the Royal College of Science, and there followed a period of amazing scientific activity which rapidly placed Forster in the front rank of British organic chemists.

For many years Forster's investigations were confined almost entirely to the chemistry of camphor, on which subject he published more than thirty memoirs under the general title "Studies in the Camphane Series". Many of these are now only of historic interest; but his work on β -bromocamphor and on the oximes of camphor and *epicamphor* are of lasting value, and the latter form a remarkable contribution to stereochemistry. In 1907, he broke new ground when, in collaboration with H. E. Fierz, the first of a long series of papers on the triazo-group appeared. This work, which was not devoid of personal risk and actually resulted in grievous injury to one of his research students, was actively pursued until 1913, when he resigned his appointment at the Royal College of Science, having been an assistant professor since 1902. Almost all Forster's papers were communicated to the Chemical Society, and they are notable for the clarity and brilliance of their exposition. This latter quality was not confined to the written word, since it was generally regarded as a 'field-day' when Forster read a paper at one of the Society's meetings.

Forster's resignation and his decision to enter politics somewhat surprised his friends, and was undoubtedly due in part to his disappointment at not having been appointed to a full professorship. The outbreak of the War in 1914 brought Forster back to chemistry and in 1915 he was appointed a director of British Dyes, Ltd., a post which he held until 1918. In these critical years he served British chemistry well. His activities were not confined to the technical side of the industry; he was mindful of the importance of social amenities for the staff, being responsible for the first staff club at Huddersfield. During 1918-22 he filled the newly created post

of director of the Salters' Institute of Industrial Chemistry, where his experience both as a teacher and in industry undoubtedly proved of the greatest value. His keen interest in the City of London Companies was further shown by his election in 1919 as prime warden of the Worshipful Company of Dyers.

Although so actively engaged in experimental research, Forster found the time to participate in the administration of the Chemical Society. After serving on the Council, he was honorary secretary during 1904-10, treasurer 1913-22 and vice-president 1910-13. The value of his contributions to science were recognized by the Society in 1918 by the award of its highest distinction, the Longstaff Medal. He was elected to the Royal Society in 1905 at the unusually early age of thirty-three, and he served on the Council. He was a regular attendant at the meetings of the British Association, being president of Section B at the Edinburgh meeting in 1920.

A complete change in Forster's life and one made at considerable personal sacrifice came in 1922 when, at the request of his friend Sir William Pope, he accepted the post of director of the Indian Institute of Science, Bangalore. The Institute, which we owe to the munificence of the Tata family, had passed through a somewhat difficult period, and it was clear that if it was to fulfil the hopes of its founders, a director of outstanding quality was required. This it found in Forster, and perhaps in the Institute will be found Forster's most lasting contribution to science. Not only did he win the loyalty and friendship of his staff, but he gained also the confidence and affection of the students. He and Lady Forster, whom he married in 1925, realized to the full their many difficulties. Their hospitality was boundless, and the Institute became a very happy family. His success as a director was due not only to his scientific attainments. He was a fine speaker, and he delighted in the social obligations which his position involved. No one will question that the high position which the Institute has now attained in India is due in large measure to the work which he did.

The many administrative duties of his post prevented Forster from continuing his scientific work in Bangalore, although for the first few years he did direct the work of some research students. But his interest in science never abated, and I personally owe much to his advice and encouragement. He was president of the Indian Science Congress in 1925 and he was an original fellow of the National Institute of Sciences. On his retirement in 1933, Forster settled in Mysore City, making occasional visits to Britain, the last being in 1939. After Lady Forster's death in 1941, his life was somewhat lonely, and he had every intention of returning permanently to London at the end of the War. He had hoped to enjoy once more the scientific life in which he had once played so prominent a part.

J. L. SIMONSEN.

Prof. John Borg

THE death, on May 4, is reported of Prof. John Borg, the most renowned of Maltese botanists. He was formerly superintendent of agriculture, professor of natural history in the University, and director of the Botanic Garden in Malta. From these official posts he retired in 1933; but up to his death he maintained his interests in botany and agriculture, and he held the title of emeritus professor of natural history in the Royal University.

Borg's contributions to the advancement of biology were varied and included research in both the pure and applied fields. His influence on education was not limited to his academic activities but extended to public lectures and to articles in the local Press and other publications written in English or Maltese. In agriculture and horticulture, his work included published accounts on the cultivation and diseases of fruit trees in the Maltese Islands, on orange culture, on vines, on scale insects, and on the pig. His book "Cacti. A Gardener's Handbook for their Identification and Cultivation" (London: Macmillan and Co., Ltd.) is well known and widely used.

The most valuable of Borg's works in systematic botany, and one that will maintain his name among all interested in the flora of the Mediterranean region, is his "Descriptive Flora of the Maltese Islands including the Ferns and Flowering Plants" (Malta: Government Printing Office, 1927). This is a book of 846 pages written in English. It includes a lucid introduction to the history of botanical investigation of the islands, their geology, vegetation and flora. The bulk of the volume consists of carefully prepared descriptions of the families, genera and species of the vascular plants, including those naturalized or commonly cultivated, of Malta and the associated islands, together with their Maltese localities and Maltese and English names. The flora gives the impression not only of conscientious preparation but also of intimate personal acquaintance with the plants described. Malta is intensively cultivated over much of its surface and almost all the rest is heavily grazed (if grazed be the right word) by the almost omnivorous goats, and there is little natural vegetation left; but its flora is surprisingly rich and of considerable importance in studies of the phytogeographical problems of the Mediterranean Basin.

I met Borg only once, in his department in the University of Valetta, and recall him as a quiet, unassuming man devoted to his work but with the widest interest in all that related to his country. His widow, to whom his "Flora" is dedicated and who was his constant companion and assistant on botanical rambles, survives him. His large collection of cacti and other succulents has been left to the Argotti Botanic Gardens and he has made other bequests to his University.

W. B. TURRILL.

Prof. E. Rádl

SOME time in May 1942, Dr. Emanuel Rádl died in Prague at the age of sixty-nine. In early life he was a biologist of local distinction. His critical abilities first reached a wider public in 1909 when he published his "History of the Development of Biological Theories", in which he stressed the changes that had occurred with regard to the significance and the evidence for evolution during the nineteenth century. He was critical of certain Continental schools of biological thought and of various 'cell theories', of temporary 'fashions' in science and of Driesch's ideas on entelechy.

Later Rádl turned his attention to philosophy, changing his chair of biology for that of philosophy at the University of Prague. He wrote several works on the history and modern trends of philosophy, and in his "Present State of Philosophy and Psychology" (1933) he expressed the opinion that Anglo-Saxon countries were then "being infected with the bacilli of moral anarchy, spiritual decadence and cold