VARIATION OF RADIATION PRESSURE WITH REFRACTIVE INDEX

Liquid	Water	Ethyl alcohol	Carbon tetrachloride	Xylene	Benzene	Carbon disulphide	Standard error (per cent)
Observed reflexion ratio	1·274	1·305	1·413	1·424	1·432	1·539	± 1·5
Corrected pressure ratio	1·348	1·374	1·478	1·502	1·517	1·637	± 2
Mean refractive index	1·329	1·358	1·457	1·489	1·493	1·613	± 0·1
Discrepancy (per cent)	+1·4	+1·2	+1·4	+0·9	+1·6	+1·5	

medium. This method again eliminated the viscosity of the medium.

The foregoing experiment has been carried out by Mr. J. C. S. Richards (University of Aberdeen), aiming at an over-all accuracy of one per cent. For this accuracy, many observations (more than four hundred) were necessary on each liquid, to average out the effects of Brownian and other disturbances. It was also necessary to allow for effects such as the slight change of reflectivity of the vane on immersion in liquid, and the loss of light in the medium as it crosses the glass/air or glass/liquid interfaces on its way to the vane. Mr. Richards's results are shown in the table.

This table shows that the proportionate increase in momentum is within 1 to 1·5 per cent of the refractive index, the experimental results being consistently high by a small amount which is probably due to some unforeseen correction that we have not allowed for. The agreement is amply good enough, however, for us to conclude that the effect has been satisfactorily confirmed. Not only, therefore, does light press against a mirror but it also gains or loses momentum whenever it crosses a refracting boundary.

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OBITUARY

Dr. G. F. Herbert Smith, C.B.E.

GEORGE FREDERICK HERBERT SMITH was born on May 26, 1872, eighty-one years ago. Well known to mineralogists for his early work on geometrical crystallography and on the scientific study of gemstones, he was better known to a wider circle for his work as honorary secretary of the Society for the Promotion of Nature Reserves and numerous other councils and committees having to do with the preservation of wild life and the protection of Nature. Most of this work, however, was done in the fifteen years since his retirement from the Natural History Museum, where he had served successively as assistant in the Department of Mineralogy, assistant secretary and secretary of the Museum and keeper of minerals for a total of forty years.

Herbert Smith came to the Department of Mineralogy at twenty-five by way of Winchester and New College, Oxford, with firsts in the finals honours schools in mathematics and physics. He spent part of a year at Munich studying under Paul Groth, and at the Museum he produced some important papers on geometrical crystallography and devised a three-circle goniometer which he used for working out the intricate problems of the crystallography of the gold telluride, calaverite (1902), and the sulpharsenite of lead, sartorite, from the famous Binnenthal locality. Early in his career at the Museum he became interested in the study of gemstones and scientific methods of identifying faceted stones. To this end he designed a convenient form of refractometer and put in the hands of jewellers an instrument that all could use effectively with very little difficulty. From 1912 he was one of the examiners for the diploma in gemmology initiated by the National Association of Goldsmiths and so remained after its Education Committee became the Gemmological Committee in 1924 and finally formed the Gemmological Association in 1931. He was president of the Association in succession to Sir William Bragg from 1942 until his death. Among gemmologists his name is a household word, and his book "Gemstones", now in its twelfth edition, contains the record of his accumulated knowledge and experience in the scientific study of gemstones both as minerals and as gems.

After the death of Charles E. Fagan in 1921, Herbert Smith left the Department of Mineralogy to become assistant secretary of the Museum. Thenceforward he became involved in administrative work. During the early part of his period in this office an important event was the move in 1924 of the zoological collections preserved in spirit into the completed eastern half of the New Spirit Building. It was probably thanks to Herbert Smith's efforts that the Empire Marketing Board made a generous grant to enable a third quarter of this building to be completed in 1930 to provide accommodation for the overcrowded Department of Entomology pending the erection of its own building (which was in the event not completed until 1952 although the south half was occupied in 1936). Some of the work of preparing evidence for the Royal Commission on Museums and Galleries in 1927 fell to Herbert Smith, and he also had the congenial task of arranging for the celebration of the fiftieth anniversary of the opening of the Natural History Museum (1931). Several collecting expeditions in East Africa were organized during this period, culminating in the successful 'Ruwenzori' Expedition by the late F. W. Edwards and Dr. George Taylor in 1934. Accounts of these expeditions were published in the *Natural History Magazine*, a museum publication which Herbert Smith edited throughout its short life during 1927–36. The preparation and sale of postcards illustrating speci-

mens in the collections was another of Herbert Smith's innovations and was completely successful.

He did many things to encourage a corporate spirit in the Museum staff, strongly supporting the formation of a sports club and rifle club, of which latter he was himself an active member. With three other senior members of the staff he organized the staff association for the scientific staff. This association was affiliated to the Society of Civil Servants, of which Herbert Smith was one of the honorary secretaries, 1918–25. He was also editor of its journal, 1923–30, and later a vice-president and president, 1929–32. It was typical of Herbert Smith that, in connexion with this work for the Society of Civil Servants, he arranged a special train to take its members and other Civil servants to Richmond, Yorkshire, to view the total eclipse of the sun in 1927. He wrote a guide to the eclipse and provided "pieces (5 by 2 ins.) of dark glass for viewing the Sun". It was no fault of his that cloud obscured the view.

The Civil Service Arts Council he served for fifteen years as honorary secretary and treasurer, and he also served on the Civil Service Sports Council and was chairman of its publicity committee from 1946. As another spare-time activity he represented the Trustees of the British Museum on the Council of the Royal Albert Hall from 1930 until his death, and was chairman of the Executive Committee, 1941–47, and a member of the Finance Committee, 1941–51.

In the last two years of his service in the Museum, he returned to the Department of Mineralogy as keeper and did some good work in arranging new exhibits of gemstones and semi-precious stones in specially illuminated cases. These unfortunately had to be dismantled only two years later on the outbreak of war so that the specimens could be put in a safer place.

Herbert Smith's work for the Society for the Promotion of Nature Reserves began in 1921 when, succeeding Charles E. Fagan in the Museum Office, he took over also the secretarial work of the Society. During his long term of office, the activities of the Society greatly increased. It was this Society that took the initiative in 1941 of getting together a conference to consider Nature protection in post-war reconstruction. This conference in its turn appointed, at the suggestion of the responsible Minister, the Nature Reserves Investigation Committee in 1942. Of both these bodies Herbert Smith was honorary secretary, and he was also chairman of the Geological Reserves Sub-Committee. These committees co-ordinated the work of no less than twenty-four regional committees in England and Wales. Two reports were issued in 1945, shortly after the end of the War, and their detailed recommendations were almost all incorporated in the report of the Wild Life Conservation Special Committee presented to Parliament in 1947 [1,2]. The establishment of the office of Nature Conservancy was a direct outcome of the recommendations of this Committee.

Herbert Smith had been chairman of the Wild Plant Conservation Board since 1931 and was interested, too, in the Society for the Preservation of the Fauna of the Empire and the Convention for the Protection of the Fauna and Flora of Africa. In a wider field he was one of the British delegation to the International Conference for the Protection of Nature held at Brunnen in 1947 [3] and of the later conference of Government representatives held at Fontainebleau under the auspices of Unesco in Paris during the following year. There he was chairman of the committee charged with the drafting of the constitution. His committee completed its task in two days and the finished draft was ready for the closing session. He attended the first General Assembly in Brussels in 1950 as head of the British delegation, and since that year he held the office of a vice-president of the Union.

Herbert Smith had outlived most of the friends who had known him as a young man. To many who served on his committees he may have seemed reserved, autocratic and obstinate. He was, in fact, determined to get things done and he usually succeeded. He understood what things were practicable, and by hard work and persistence he accomplished much. That was his reward for the devotion with which he worked for the protection of Nature, to which cause he gave, voluntarily and unpaid, almost all his time for the fifteen years that followed his retirement from the Natural History Museum.

He died after a short illness on April 20, 1953, and leaves a married daughter. His wife, a daughter of the late John Ellerton, of Leamington, died in 1936. He was a Fellow of the Royal Astronomical Society, a member and a past vice-president of the Mineralogical Society, and for many years a Fellow of the Geological Society and a member of the British Association. He was awarded the C.B.E. in 1949.

W. Campbell Smith

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[3] *Nature*, **160**, 320 (1947).

NEWS and VIEWS

Geography at Glasgow : Prof. A. Stevens

The retiring professor of geography in the University of Glasgow, Prof. A. Stevens, commenced his long association with the University as an arts student and graduated M.A. in 1907. After a short break, he continued his studies in the Faculty of Science and obtained his B.Sc. as a geologist. In 1914 he joined Shackleton's South Polar expedition, and was marooned for two years in the Antarctic. On returning home Stevens served with the Army until the end of hostilities. In 1919 he was invited to organize a Department of Geography at Glasgow ; a lectureship had been established in 1909 but was in abeyance. It was not until as late as 1947 that a chair of geography was established with Stevens as the first professor. He has devoted his energies very largely to the development of the Department on what he believed to be a sound basis ; the emphasis has been on regional geography. At the same time, he has contributed notably by papers and in discussion to theoretical aspects of his subject ; his presidential address to Section E (Geography) at the British Association in 1939 is an example. Prof. Stevens has not been a prolific writer ; but his papers have covered a wide field and each has been a stimulus to his fellow workers. There have been contributions of lasting value on physical geography in which his earlier interests undoubtedly lay, and latterly papers to the Institute of British Geographers have dealt with problems of population distribution in the British