Kermack, William Ogilvy
(1898–1970)
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Kermack, William Ogilvy (1898–1970), biochemist and mathematical epidemiologist, was born on 26 April 1898 at Kirriemuir, Forfarshire, the only son of William Kermack, postman, and his wife, Helen, *née* Ogilvy (*d*. 1904). After his mother's death he was mainly brought up by his father's sister. At five he was sent to a local school, Webster's seminary; there he received an excellent education, being taught co-ordinate geometry and geometric conic sections by the headmaster and general science by G. K. Sutherland, later professor of biology at Southampton.

In 1914, aged sixteen, Kermack took thirteenth place in the University of Aberdeen bursary competition: he matriculated in that year. In 1918 he graduated MA with first-class honours in mathematics and natural philosophy and BSc with special distinction in mathematics, natural philosophy, and chemistry, winning four prizes and medals and, in 1919, the Ferguson scholarship in mathematics. After graduation he served six months with the Royal Air Force at the Martlesham Heath Experimental Station. From 1919 until 1921 he worked in a British Dyestuffs Corporation research group under W. H. Perkin and with Robert Robinson at the Dyson Perrins Laboratory, Oxford. This work led to his first publication: it dealt with the synthesis of norharman, the fundamental structural unit of the alkaloids harmaline and harmine.

In 1921 Kermack took charge of the chemistry department at the laboratory of the Royal College of Physicians of Edinburgh. Most of the funding of the laboratory, founded in 1887, came from the Carnegie Trustees for the Universities of Scotland. A. G. McKendrick, director of the Pasteur Institute at Kasauli, India, had been appointed superintendent in 1920. Like Kermack, he had a deep interest in the mathematical aspects of biology.

While working alone in the chemistry laboratory on 2 June 1924 Kermack was totally and permanently blinded when a preparation exploded, driving caustic alkali into his eyes. He bore his loss with courage and immediately retrained himself. He returned to work before the end of the year, the Board of Scientific and Industrial Research and the Carnegie Trustees providing him with a special assistant. In his subsequent twenty-five years at the college laboratory he published eighty-four papers. In 1925 he married Elsábeletta Raimunda Blásquez, daughter of Raimundo Blásquez of Anguilas, Spain. Kermack's continued work on the synthesis of indole compounds led to the award of a DSc degree from Aberdeen in 1925, but he also established two new and highly productive collaborative ventures. Work with McKendrick led to the publication in 1927 of the classic paper *'A contribution to the mathematical theory of epidemics'* (*PRS*, 115A, 1927, 700–21). This established the threshold theory, a cornerstone of modern theoretical

epidemiology. In Kermack and McKendrick's own words, it postulates that:
for each particular set of infectivity, recovery and death rates, there exists a critical or threshold density of population. If the actual population density be equal to (or below) this threshold value the introduction of one (or more) infected person does not give rise to an epidemic, whereas if the population be only slightly more dense a small epidemic occurs.

In a series of papers published over the next twelve years special cases and dynamics were considered, and the theory was tested against data from the field and from the experiments of Greenwood and others on ectromelia and mouse typhoid.
Kermack's other collaboration was with University of Edinburgh mathematicians. It focused particularly on Whittaker's conjecture on the solution of differential equations by definitive integrals, and the central theorem establishing the existence of a quantity associated with two neighbouring null-geodesics in a Riemannian space that depends on the two geodesics as a whole.

During his lifetime Kermack was best known for his work on the organic chemistry of antimalarials. His work focused on the synthesis of heterocyclic compounds, particularly the creation of quinolone derivatives. He hoped to deduce rules relating structure to chemotherapeutic activity. He collaborated with workers on avian malaria at the Molteno Institute, Cambridge, and chemists in the ICI drystuffs division, receiving support from the Department of Scientific and Industrial Research, the Chemical Society and the Carnegie Trust. His main achievement was to devise a synthetic route to acridines related to atebrine. This facilitated the production of mepacrine, which became the major British antimalarial when the supply of German products was cut off in 1939.

In 1949 Kermack moved to Aberdeen as the first MacLeod-Smith professor of biological chemistry. He built up a department noted for the quality of its teaching and the breadth of its research interests. Active in committee work, he was dean of science from 1961 to 1964, and from 1949 to 1969 an effective governor of the Macaulay Institute for Soil Research and the Rowett Research Institute for Animal Nutrition. During his career he was honoured by election in 1925 to the Royal Society of Edinburgh (council 1946–9) and the Royal Society (1944), and the award of the Freeland Barbour fellowship of the Royal College of Physicians of Edinburgh (1925), the Makdougall Brisbane prize of the Royal Society of Edinburgh (1928), and the LLD (St Andrews) in 1937.

Kermack's wife, Elsábeletta, looked after him devotedly, and he received enormous support from his staff, who read scientific papers to him. Radio was invaluable to him. On the left politically, he was an agnostic. He retired in September 1968, retaining an office in Marischal College, in which he died suddenly on 20 July 1970. His wife survived him.

Sources

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DNB

Likenesses

W. Stoneman, photograph, 1946, repro. in Davidson, *Memoirs FRS*

Wealth at Death

£13,042 13*s*. 4*d*.: confirmation, 26 March 1971, *CCI*
£327 3*s*. 2*d*.—held in trust: 26 March 1971, *CCI*