

PIONEER LEADERS IN PLANT PATHOLOGY: W. J. DOWSON

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Walter John Dowson was born in Bristol, England, on 22 May 1887 and died on 1 September 1963, at the age of 76, after an unusually full and varied life. Those meeting him for the first time found a kindly and unassuming man, able at once to put them at their ease. Nevertheless, in his own field of plant pathology, that of bacterial plant diseases, Dowson was a true pioneer. But he did not begin the work that was to make him well known to all plant pathologists of his time until he had reached the age of forty-five.

FAMILY HISTORY, PERSONALITY, EDUCATION

Dr. W. J. Dowson's father was Walter Dowson, MD, of Bristol, who was at one time director of the Burroughs Wellcome Physiological Research Bureau at Herne Hill (London), where he was concerned with development of antidiphtheria sera and similar products. Dowson once remarked to me that his father had been very like his teacher and later colleague F. T. Brooks in that he had a strong and even dominating personality. By contrast, the son was singularly lacking in aggressiveness but this, together with his warm interest in other people and their affairs, contributed to the felicity of his human relationships. His mother was born Blanche Baily and her Bristol family had earlier founded the tobacco business later sold to the brothers W. D. & H. O. Wills. A well-known member of this family was Edward Hodges Baily, R. A. (1788-1867), a sculptor who carved the bas-reliefs on the south side of the Marble Arch in London, and also modeled the statue of Nelson in Trafalgar Square. Perhaps it was this family connection that led to Dowson's interest both in Nelson's life and in the strategy



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of naval warfare; he also enjoyed building ship models. This was an unlikely hobby for such a man, but his character was not so simple as his manner suggested. He was a natural taxonomist, yet he would not venture an opinion unless certain he was right. Sometimes on fungus forays with their students, his colleague F. T. Brooks would brandish a toadstool and call out in a stentorian voice "What's this, Dowson?" Dowson usually knew the right answer, but he often lacked the confidence to return an unequivocal reply. Just so, his final interpretations of his own and his predecessors' work have withstood the passage of time remarkably well.

As a boy, Dowson was educated first at Dulwich College near his home in S. E. London and then went as a boarder to Oundle School in Northamptonshire, at the early age of about 10 years. In 1906 he went up to Christ's College in Cambridge with a scholarship and three years later gained Class I honors in Part I (three subjects) of the Natural Sciences Tripos. In 1910, he did nearly as well (Class II) in the more difficult examinations for Part II (botany) and took his BA degree. His early academic success was event-

ally crowned in 1950, when the University of Cambridge awarded him its highest mark of scientific merit, the degree of ScD, for his published work. After graduation, he worked at the Botanisch Laboratorium in Hamburg under Professor H. Klebahn for two years and became proficient in the speaking and writing of the German language, as his first paper shows (1).

OUTLINE OF CAREER

In 1913, Dowson went as government mycologist to Kenya, where he worked on sprays for control of coffee leaf rust caused by *Hemileia vastatrix* (4) and on diseases of various crops (5). Here he met Miss Muriel Jessie Johnstone, whom he married in April 1915, and a son and daughter were later born of the marriage. Mrs. Dowson took a close interest in her husband's work, which he regularly discussed with her. In 1920, Dowson was appointed mycologist to the Royal Horticultural Society's Gardens at Wisley, south of London, and there he worked on various diseases, chiefly fungal, of ornamentals and fruit trees (7-14). In 1928, he went abroad again, accompanied by his wife and family, as plant pathologist to the Department of Agriculture in Tasmania (15, 16). There his professional skill together with his more human qualities made him a great success with the orchardists and other growers. To this day I can remember the envy with which I heard from my Australian colleagues of Dowson's popularity with the growers, with whom I was at first finding communication both difficult and alarming.

The year 1932 was a significant divide in Dowson's research career and was the result of a generous benefaction to Cambridge University from the Rockefeller Foundation. This enabled both a considerable extension of the Botany School Building and the acquisition of a field station on the outskirts of Cambridge, comprising about 1.2 ha land, glasshouses, and a field laboratory. An endowment was also provided for establishment of a Subdepartment of Mycology (under F. T. Brooks) and one of Plant Physiology (under F. F. Blackman). So Brooks secured Dowson's appointment as a university lecturer in his new subdepartment, from 1932 onwards. As an undergraduate, Dowson had impressed Brooks by his performance; less than five years in age separated student from youthful teacher but from then on Dowson continued to seek Brooks's advice whenever he needed it. But the traffic was not all one way; as colleagues they supported one another. At one time, Brooks had been quite a heavy cigarette smoker; Dowson eventually managed to persuade him to do as he did and smoke a pipe instead. A pipe features prominently in all the later portraits of Brooks. When Brooks retired as professor of botany in 1948, he was succeeded as director of the Subdepartment by Dowson, who then had only four years to go before his

own retirement as a university teacher in 1952. As colleagues, for part or all of the time, Dowson had Dr. John Rishbeth, Dr. N. F. Robertson (now Professor of Agriculture at Edinburgh), and myself. Dowson made a kindly and considerate head of our small subdepartment; he was always so eager fully to ascertain our views that the transaction of business sometimes took longer than it need have done, but this was a small price to pay for so equable a relationship.

RESEARCH WORK

Up to the year 1932, Dowson's opportunities for programmed research had been severely circumscribed by the heavy demands of extension work in Kenya, at Wisley in England, and again in Tasmania. The decision, made with Brooks after his return to Cambridge as a teacher, that he should give a course of lectures and practical work on bacterial plant diseases also gave him at last the opportunity for sustained research on these diseases, on some of which he had already published (14, 15). As his bibliography from 1935 onwards shows, Dowson, together with his graduate students and visiting workers from overseas, worked on a wide variety of bacterial diseases. His overseas associates who published with him included Dr. Maria D'Oliveira from Portugal (17), Dr. Z. Volcani from Israel (28), Dr. J. C. Hopkins from Southern Rhodesia (30), Dr. K. A. Sabet from Egypt (33, 40), Dr. E. Hellmers from Denmark (34), Dr. P. O. Wiehe from Nyasaland (now Malawi; 36), and Dr. D. Sutić from Yugoslavia (41, 42). Dowson corresponded regularly with plant bacteriologists in the USA and one of them, Dr. Mortimer P. Starr, was a particularly welcome visiting worker in Cambridge, as I can well remember.

But Dowson's contributions to the understanding of bacterial plant diseases, important though they were, may well be outlasted by his influence on classification of the pathogens. In 1939 and subsequently, Dowson classified plant-pathogenic bacteria mainly into four genera (21, 23, 25, 26, 29). Gram-negative bacteria with peritrichous flagella were first placed in the genus *Bacterium* Ehrenberg 1828, emend. Dowson 1939, and green-fluorescent species with polar flagella in *Pseudomonas* Migula 1897, emend. Dowson 1939. A new genus, *Xanthomonas* Dowson 1939, was created for gram-negative bacteria of color yellow in mass and with a single polar flagellum. This disposition of gram-negative pathogens within *Pseudomonas* and *Xanthomonas* was generally accepted at the time and subsequently. But after the generic name *Bacterium* had been declared invalid by the Sixth International Congress for Microbiology at Rome in 1953, Dowson (37) was obliged to redistribute species from this discarded genus between *Pectobacterium* Waldee 1945, emend., and *Erwinia* Winslow et al 1917,

emend., according to whether or not they were able to liquify pectate gel. Less difficulty was experienced with the much smaller number of gram-positive pathogens, six species of which were transferred (25) to the genus *Corynebacterium* Lehmann & Neumann from Bergey's *Phytomonas* 1939, which at that time embraced a heterogeneous collection of both gram-positive and gram-negative pathogens.

The history of this evolving classification of bacterial plant pathogens is told by Dowson in his textbook, the first edition (29) of which was published by Adam and Charles Black (more widely known as publishers of *Who's Who*) in 1949, and the second edition (37) by the Cambridge University Press in 1957. The first edition is dedicated to Professor F. T. Brooks "who first introduced the author to mycology and subsequently encouraged him in the study of bacteria and bacterial plant diseases" and the second to his memory. This dedication epitomizes the long and fruitful collaboration between these two men, who together advanced their subject by research and are together well remembered by their former students.

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