



F. Z. Weiss

FREDERICK ERNEST WEISS

1865-1953

FREDERICK ERNEST WEISS was born on 2 November 1865 in Huddersfield, to parents of outstanding character and principles. His father, Charles John Philip Weiss, had been born in Germany, and was learning business in Holland when, in 1848, he was recalled to serve in the German army. At that time troops were being used to repress democratic risings in Germany, and since young Weiss held liberal and progressive views he refused to return. In consequence he was unable afterwards to go back to his home, and after spending ten years in Holland he came to England and established himself as a merchant in Huddersfield. He married Elizabeth Caroline, daughter of Frederick Pesel, a banker in Paris. One of her ancestors was the Huguenot, Thomas Delacourt, who came to England and settled at Wareham, where he was greatly esteemed for his piety and courage. After his death in 1733 he was commemorated in a tablet in the Congregational Church at Wareham as an intrepid supporter of civil and religious liberty in the troubled times at the end of the 17th century. Under James II his home was denounced as a conventicle, his goods were seized and were twice exposed for sale without the appearance of a single purchaser. Furthermore, at the risk of his life he removed from the Town Hall in the dead of night the heads of three gentlemen who had been condemned for their religious views by Judge Jeffries and executed. He hid these heads under his own bed and afterwards interred them. He took an active part in the revolution of 1688, joining William III when he landed at Torbay.

Frederick Weiss was the third of five children. His father had attained a prominent position in the North of England as a merchant; he was a strong supporter of the Free Trade movement, and was a member of a delegation of British manufacturers and merchants which accompanied Richard Cobden on a visit to France to negotiate a commercial treaty. But when Frederick was only three years old his father died, leaving his mother to bring up and educate her young family on a slender income.

To obtain the best possible education for her children, Elizabeth Weiss went to live in Germany, where schooling was much less costly than in England. The family settled in Heidelberg, where Frederick, who was already bilingual, spent three years at a preparatory school, and in 1876 went on to the Heidelberg Gymnasium, where the education was mainly classical. In 1881 the family moved to Switzerland so that the children

might learn to speak French fluently. Settling at Neuchatel, young Frederick entered the *Gymnase Scientifique* to obtain a scientific education, but he kept up his studies in Latin and Greek by private tuition. He has told us that his mother was a great lover of nature, and that she encouraged her son to take a lively interest in natural history. Some two years later he returned to England, and worked for the London Matriculation examination.

He entered University College, London, in 1884, intending to read for Honours in botany, but in fact he devoted most of his first year to the study of zoology and was awarded a gold medal at the end of the course. This change of interest was doubtless due to the fact that the Chair of Zoology was then occupied by Ray Lancaster, who was a most inspiring teacher. On the other hand the teaching of botany at that time was in the charge of Professor Daniel Oliver, who was also Keeper of the Herbarium at Kew; his lectures were delivered at eight o'clock in the morning, after which the Professor returned to Kew where his main interests lay. The practical teaching in botany, which had been organized by F. O. Bower in 1880, was conducted by D. H. Scott, but in 1885 he migrated to South Kensington to act as assistant to Huxley. In his second year Weiss acted as a student demonstrator in zoology, and attended a course of lectures given by Scott. Shortly afterwards the position in the botanical department was greatly improved by the arrival from Cambridge of F. W. Oliver as assistant to his father. Frank Oliver was one of the small band of distinguished men who were trained at Cambridge by S. H. Vines, Francis Darwin and Walter Gardiner in 'the new botany', with an emphasis on plant physiology, anatomy and biology. Weiss at once reacted to his influence and at the end of the year gained the gold medal for botany. In his fourth year he acted as a demonstrator for Oliver, while doing some research in zoology with Lancaster. He took his Degree in 1888, with First Class Honours in zoology, and he was awarded a graduate scholarship of £50.

After graduation, Weiss went to the Zoological Station at Naples, where he occupied the British Association table, and carried out investigations on *Amphioxus* suggested by Ray Lancaster. Among other things, he discovered the excretory tubules associated with the gill-bars of these animals, which he fed on carmine. This work formed the subject of his first published paper(1). While at Naples he received a letter from Oliver telling him of plans for developing the study of botany at University College, and suggesting that he should come home and become a professional botanist. After consulting Lancaster, Weiss decided to abandon zoology, and went to the University of Strasbourg for a term, where he studied under Solms-Laubach, Wortmann and Zacharias. When Frank Oliver succeeded his father as professor in 1890, Weiss became a lecturer in botany and the first Quain Student. He held these posts for three years, during which he carried out an interesting investigation on the structure and development of the latex cells of the Chinese rubber producing plant, *Eucommia ulmoides*(2). At the age of 26 he was appointed Professor of Botany in Owens College,

Manchester, succeeding Professor W. C. Williamson, who had resigned the Chair at the age of 76.

Williamson had been appointed Professor of Natural History in 1851, and, although practising as a medical doctor, he had made important contributions to botany, geology and zoology; he was a great collector, and very active as a popular lecturer on scientific subjects. His successor would need to be a man of wide sympathies and interests, and it is known that two other men, who afterwards became very well-known professors of botany in other universities, were also considered for the post. Subsequent events showed that the Manchester authorities could scarcely have made a better choice. During the thirty-eight years that Weiss held the Chair he not only built up a large department with a high reputation, in which many honours graduates were trained, but he also played an important part in the progress and development of the University, in the expansion of the Manchester Museum, and in the intellectual life of the city.

Before accepting the Manchester Chair Weiss asked Ray Lancaster for his advice, and was told of the risk that he might find difficulty in continuing to do research work, owing to teaching and administrative duties. But though his teaching and administrative work proved heavy, he was able to devote some time to his own researches and to those of his pupils throughout his career. At first his laboratory accommodation was confined to a single room, but his fame as a teacher gradually spread, and more and more students were attracted to the study of botany. After some temporary expedients, a new block of laboratories was built for him in 1911. Manchester became the main centre of botanical teaching and research in the North of England, and among the men whom he trained many have since become eminent in their subject. Among these were several who later held Chairs of Botany, viz. W. B. Brierley (Agricultural Botany, Reading), T. G. B. Osborn (Adelaide, Sydney and Oxford), W. Leach (Montreal), Wilfred Robinson (Aberystwyth), and W. H. Pearsall (Sheffield and University College, London).

Weiss took a keen personal interest in the progress and welfare of all his students. Always friendly and approachable, he did much to inspire in them his own high ideals as a man and a scientist. He gave them a broad outlook on the problems of plant life, particularly with reference to the relation of plants to their environment.

His published work covers a wide field of botanical enquiry. His most important contributions to knowledge, were his papers on the structure of the plants of the Coal Measures. He made a special study of the peculiar roots of the great lycopod trees, which are characteristic elements in the flora of the Carboniferous period. These structures had been studied by his predecessor, Williamson, and had been the subject of much controversy. From the standpoint of the rigid morphology of the 19th century they presented an insoluble problem, since they appeared to have some of the characters of shoots, though they were undoubtedly underground organs spreading through the mud and peaty material in which the plants grew. Weiss

undertook a detailed and systematic study of these structures, which are placed in the organ genus *Stigmaria*, and published a series of papers on them between 1902 and 1911. He returned to the subject later on several occasions to point out the results of increasing knowledge, and surveyed the whole problem in his presidential address to the Linnean Society(48) in 1932. In this work and in other papers he dealt not only with anatomy and morphology, but also with the relation between the structures he studied and their probable environment. He studied the aerating tissues in the stems of the lepidodendroid trees(21), and also the tissues in them which are generally described as phloem, though they show none of the features which characterize this tissue in the higher plants(5). In 1913 he recorded the results of a study of some sections of coal-balls which showed well preserved apices of the roots of *Lyginopteris*(32); he was unable to say with certainty that these roots had a single apical cell, but he found that the tracheidal tissue of the lateral rootlets emerged as a vertical plate, like that of the phanerogams. In his presidential address to the British Ecological Society(39) in 1925, he gave an interesting survey of the structural evidence bearing on the environment in which the forests of the Upper Carboniferous grew.

Fossil plants by no means monopolized his interests. He was constantly studying plants in the field and the garden. The earlier volumes of *The New Phytologist* and the *Proceedings of the Manchester Literary and Philosophical Society* contain many of his short papers on a variety of topics, such as observations on the pollination by insects of the common primrose(9, 14), on the dispersal of seeds by ants(23, 25), on the distribution of the gorse *Ulex europaeus*, and on the vegetation of South Africa(16, 17, 18). He was well acquainted with the vegetation of the British Isles and of Switzerland; he had visited Canada and various parts of the United States, and he went to South Africa in 1905 with the British Association. He took a keen interest in the new methods of study of the vegetation of Britain introduced by Robert Smith and carried on by W. G. Smith, Tansley, Moss and others. He was a member of the Central Committee for the Survey and Study of British Vegetation, and this committee often met in his department at Manchester. He took an active part in the formation of the British Ecological Society in 1913, served on its first council, and was its President in 1925.

The development of the study of genetics which followed the re-discovery of Mendel's work, attracted his interest. He carried out a series of experiments on the inheritance of colour in *Anagallis arvensis* L., using the blue and the scarlet forms which occur wild in Britain(27). About 1912 he was studying the results of crossing *Geum urbanum* and *G. rivale*, showing that the wild form *Geum intermedium* was a natural hybrid between them(31). In 1928 he was investigating the genetics of a mutant form of *Tropaeolum* which had spatulate leaves instead of the normal peltate foliage(42).

While retaining a keen interest in the investigation of fossil plants which was being carried on in the Manchester laboratories by his colleagues, Professor W. H. Lang, Dr (now Professor) John Walton and others, his later

investigations were all concerned with living plants. He devoted much time and thought to the problems of graft-hybrids and chimaeras. In 1925 he examined the leaves of *Crataegomespilus*, a plant which is regarded as a graft-hybrid of the hawthorn and the medlar(40). He showed that the epidermal cells were unlike those of the medlar, although the outer tissues of the hybrid were derived from the latter plant. These observations, which were later confirmed by Haberlandt, suggested some kind of vegetative combination of characters. He gave a full discussion of the problems of graft-hybrids in an article in *Biological Reviews*(45) a few years later. He dealt with the nature of variegated leaves in his 1933 address to the Linnean Society. His presidential address to the same society in 1934 was on the northward extension of the Mediterranean flora. His last published work appeared when he had reached the age of 76.

At Manchester the interests and activities of Professor Weiss were not confined to his own department. He served for long periods on the Council of the University, and repeatedly acted as Pro-Vice-Chancellor. Following the resignation of Sir Alfred Hopkinson in 1913, he was appointed Vice-Chancellor, and he thus had the great responsibility of guiding the university through the trying opening period of the first World War. He held this position for two years. Throughout his tenure of the Chair of Botany he acted as supervisor of the botanical department of the Manchester Museum, he did much to make its large exhibited collections interesting to the public and of real educational value. Almost every year he gave a course of lectures in the museum, which attracted eager and attentive listeners, for he was a fluent speaker and knew well how to select his material. He took much interest in the development of museums as a means of educating the public, and interesting them in natural history. He served on the Museums Committee of the British Association. In public affairs outside the University his advice and help were frequently sought and much valued. He assisted the University Settlement and its work, and helped many movements for the education and betterment of the people of Manchester.

Weiss was elected a Fellow of the Royal Society in 1917 and served on the Council from 1924 to 1925. He took a very keen interest in the Linnean Society, serving on its council for several terms, and acting as its President from 1931 to 1934. He was President of the Manchester Microscopical Society for about fifteen years, and from 1908 to 1910 was President of the Manchester Literary and Philosophical Society. He was President of the South Eastern Union of Scientific Societies in 1937. He gave much of his time to the affairs of the British Association for the Advancement of Science. He was the first secretary of the section for botany after its formation as a separate section in 1895; he was President of this section at the 1911 meeting at Portsmouth.

On retiring from his Chair at Manchester in 1930 he was given the title of Emeritus Professor, and later received the Honorary Degree of LL.D. For six months he acted as Professor of Botany at the University of Cairo,

but declined a request to undertake a longer term of duty there. He was Visiting Professor in the University of Basle for a term, and spent another term at Reading University. He then was living near Guildford and spent much of his time at the garden of the Royal Horticultural Society at Wisley.

For the next ten years his energies were mainly devoted to the affairs of the Royal Horticultural Society; he served on its Council from 1935 to 1940, and again from 1941 to 1946, was an active member of its scientific and library committees, and was for some years chairman of the R.H.S. examining body. His services were recognized by the award in 1947 of the Victoria Medal of Horticulture.

Throughout his life he was helped and encouraged by his wife, whom he married in 1898, and who survived him. She was Evelyn Spence Watson, third daughter of the Right Honourable Dr Robert Spence Watson, of Gateshead, writer and politician, who was a close friend of John Morley (later Lord Morley), and was at one time President of the National Liberal Federation. To those who, like the writer, were often guests at their home, Evelyn Weiss appeared the ideal wife for a botanist. She always took a lively and well-informed interest in her husband's pursuits, accompanied him on his travels, entertained his friends, and devoted herself to making his life smooth and easy. Their family consisted of three daughters, all of whom took university degrees.

Frederick Weiss died on 7 January 1953 at Sydenham, at the age of 87. The last years of his life were placid and untroubled, he maintained his interest in many things, but more especially in the progress of those who had been his pupils or colleagues at Manchester.

His passing severs one of the few remaining links between the biology of to-day and of that great period of high endeavour, great enthusiasm and high hopes, which have been so amply fulfilled. Among the young men who drew their inspiration from Huxley, Vines, and their entourage, few could have done more than Weiss to spread a knowledge of, and an interest in plants as objects of truly scientific studies. Few men of his standing could have been more modest, more willing to help his students or other young scientists who came to him for assistance or advice. As a speaker and lecturer he was always lucid and interesting. As chairman of committees he was admirable in his grasp of the details of the business, and also in the tact with which he conducted the meetings. Above all he had a real gift for friendship. By his fine personal character he inspired and encouraged a large number of those who were privileged to know him. It may well be that his greatest contribution to knowledge is to be found, not in his own published work, but in the researches of those numerous students of plant life who came under his influence.

The photograph is reproduced by the courtesy of Mr F. W. Schmidt of Manchester.

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