

Phycological Trailblazer

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Felix Eugen Fritsch

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Felix Eugen Fritsch (26 April 1879 – 2 May 1954) (Fig. 1) was a major figure in phycology in the first half of the 20th century (Lund, 1996). His accomplishments and contributions deserve a re-telling in this series. Of German extraction, he was born in London on 26 April, 1879, the son of a schoolmaster. His education was from the University of London, and his D. Phil. degree was earned at the University of Munich in 1899. He was an instructor in the period 1902 to 1911 back at the University College, London. Following that stint, he moved to Queen Mary College, London. He received the rank of Professor of Botany in 1924 and served until his retirement in 1948. Fritsch's (1902a, b, 1903b, 1905) early publications dealt with the phytoplankton of the River Thames. He paid attention to periodicity in the algae (1906b). The scope of his interest in freshwater algae extended to Sri Lanka [Ceylon] (1907a) and other tropical regions (1907b), including South Africa



Fig. 1. Felix Eugen Fritsch and Mrs. Fritsch, on a picnic near Stockholm, Sweden, 1950 (image by W. R. Taylor, MICH.)

(Fritsch, 1918; Fritsch & Rich, 1924, 1925, 1929, 1937; Fritsch & Stephens, 1921). He worked up collections of freshwater algae from the South Orkneys and elsewhere in the Antarctic (1912a, b, c, 1917). In his later studies (1929a) of the encrusting flora of rapid-moving streams on the north coast of Devonshire, he recognized that the blue-green algae were the most abundant constituents. He also noted the presence of diatoms and a new species of *Gongrosira* (*G. fluminensis*). He published an account of our knowledge of algal ecology of static waters, providing an in-depth review of previous work (1931). With R. P. John, Fritsch newly recorded many taxa of algae from soils in the British Isles including a number of new species (Fritsch & John, 1942). He described several new species of *Sphaeroplea* (Fritsch 1918, 1929b; Fritsch & Rich, 1929).

Fritsch demonstrated a remarkable ability at synthesis, in recognizing the parallel trends among the diverse algal classes but yet the differences that separated them (1929c). He was able to apply new data to innovative schemes of classification (Fritsch, 1944c). Fritsch described many new genera of algae and Cyanobacteria, including *Cladophorella* (Fig. 2) (1944b) and (with M. F. Rich) *Pearsoniella* (1924b) and *Raphidiopsis* (1929). But some of his

new genera did not stand the test of time. His *Chamaesiphonopsis* (1929a) was later merged within *Chamaesiphon* by Komárek &

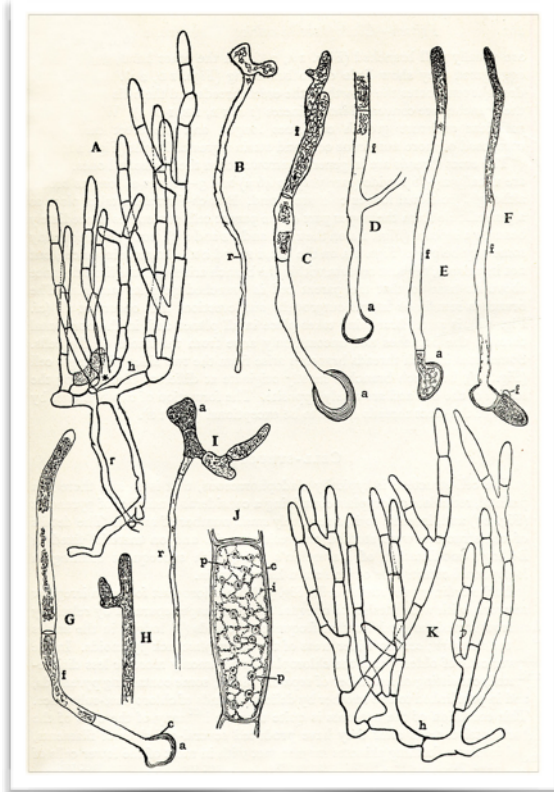


Fig. 2. *Cladophorella calcicola*. [From fig. 2 in Fritsch, 1944b.]

Anagnostidis (1999), and his *Chrooderma* (1942a) was merged within *Cephaleuros* by Printz (1964). Although Geitler (1942) had treated his two species of *Fischerellopsis* (1932) within *Fischerella*, the former name is currently accepted by Komárek & Hauer (2012). His *Isococcus* (1914), based on his *I. sphagnicolus*, was later regarded as within the circumscription of *Chlamydomonas* (Fritsch & Takeda, 1916). His *Scotiella*, based on his *S. antarctica* (Fritsch, 1912a), has been variously interpreted, such as the zygotes of some snow algae (Stein & Amunsen, 1967; Hoham & Mullet, 1978). In referring to “all the *Cosmarium* -like forms, in which the endview is 3- or more-sided with non-produced angles, under one common generic heading”, Fritsch (1953: 266) stated “the name *Cosmostaurastrum* may be suggested”. The somewhat provisional treatment of this generic name would render

it invalid (ICN, Art.34.1). AlgaeBase does not recognize the name at this time (Guiry & Guiry, 2012).

At the time of the International Botanical Congress held in Cambridge, England, in 1930, Fritsch was the recognized phycological authority on the world stage, and that pre-eminent stature is reflected in his front row, center position in the photo that was taken of the assembled phycologists on that occasion (Fig. 3). Even then, his major achievement was in the future, namely, the publication of his two volumes *The structure and reproduction of the algae* (Fritsch, 1935, 1945a). Up to that time, there was no such comprehensive work, other than the volumes (in German) by Oltmanns (1904-1905). So his monumental synthesis of the literature on all groups of algae was a tremendous accomplishment. The high quality of his work and his insight still stand as a bench mark in the annals of phycological literature.

Over his long career, Fritsch showed a special interest in the Cyanobacteria, producing treatments on *Aphanochaete* (1902c), *Anabaena* (1949d), and blue-greens with lime-producing capabilities (1946, 1949b, 1950a, b). His presidential address for the Linnean Society demonstrated his long fascination with the heterocyst in Cyanobacteria (1951a). In a later presidential address, Fritsch (1953) presented his views on the Desmidiaceae, which he considered “a polyphyletic group”.

He contributed his ideas on the widespread occurrence of heterotrichous growth in various unrelated groups of algae, including Cyanobacteria (Fritsch, 1939), and thought that from it advanced types of thalli originated (Fritsch, 1942b). His interest was not restricted to freshwater algae, but he showed a breadth of interest, including life-history differences and strategies in the marine algae (1942c, 1943a, 1949c) and anatomy of the Fucales (1945c, 1952a). In the latter phase of his career, he clearly



Fig. 3. Phycologists attending the International Botanical Congress, Cambridge, 1930.

Front row: Robert W. Kolbe, Gustav A. Senn, Gilbert Morgan Smith, Adolf Pascher, Felix Eugen Fritsch, Nils Svedelius, Margery Knight, Harald Kylin, Nellie Carter; Back row: Bruno Schussnig, Arthur Disbrowe Cotton, M. O. P. Iyengar, Benjamin Millard Griffiths, Geoffrey Tandy, William Randolph Taylor, Anne Hof Blinks, W. H. Pearsall, M. Alison Westbrook, Ethel M. Poulton; on grass: Anthony Rees, Lothar Geitler [Courtesy of Univ. Mich. Herb. archives.]

became more occupied with questions on the evolution within the groups of algae and the relationships of algae to land plants (1949c).

Fritsch (1951b) contributed a chapter on the Chrysophyta in G. M. Smith's *Manual of Phycology*, and at that time that phylum consisted of only three classes, the Xanthophyceae, Chrysophyceae, and Bacillariophyceae. In the 60+ years that have followed, our understanding of that algal assemblage, now usually called the Ochrophyta, has come to recognize (at the moment) a total of 18 classes (Guiry, 2012).

One of Fritsch's legacies is the ongoing accumulation of illustrations of freshwater algae. He started it around 1912, with his own illustrations, and he kept adding to it his own sketches and as well as

illustrations from the literature, such that by the time of his death, the collection contained around 20,000 illustrations. They were donated by his widow to the Freshwater Biological Association, which has continued the practice of gathering images of freshwater algae, thanks largely to Dr. John W. G. Lund (Lund, 1961). The Inter Documentation Company issued a microfiche of the collection of illustrations in 1964, with a series of supplements later being issued (1972, 1978, 1982, 1987, 1992, 1996). The Fritsch Collection of Illustrations of Freshwater Algae has grown to more than half a million figures (Dorr & Nicolson, 2009). Many of these images were used in the production of *The freshwater algal flora of the British Isles* (John et al., 2002, 2011). Fritsch was a significant force in the founding

of the Freshwater Biological Association in 1929. An anonymous note (1955) on his passing recounted the launching of the Freshwater Biological Association and its “struggle” to come into existence, at a meeting in June, 1929. Then on a cold day in March, 1931, Fritsch and Mr. J. T. Saunders, the Hon. Secretary, traveled to Windemere to inspect a few rooms in Wray Castle. Three rooms were available to rent to start the fledgling Association (a boudoir, a smoking room, and a library, which was the third and largest room). With its limited funds, then insufficient to build a new station or a laboratory, the Association “would have to make the best of what had been offered in the Castle”. With time, the whole building would be later occupied by the Association.

Fritsch was elected as a Fellow of the Royal Society in 1932 and was honored with their Darwin Medal in 1950. From 1949 to 1952 he served as President of the Linnean Society. Iyengar (1932) remembered him with the honorific *Fritschella* (Fig. 4), a genus possessing several distinctive features, including the formation of parenchyma and perennating “tubers” (Fritsch, 1945b).

Anonymous. 1955. Report of the Council for 1954-55. Freshwater Biological Association Twenty-Third Annual report for the year ended 31 March, 1955...pp. 7-10, with portrait of Fritsch.

Dorr, L. J. & D. H. Nicolson. 2009. Taxonomic literature...Supplement VIII: Fres-G. Regnum Vegetabile vol. 150. Gantner Verlag.

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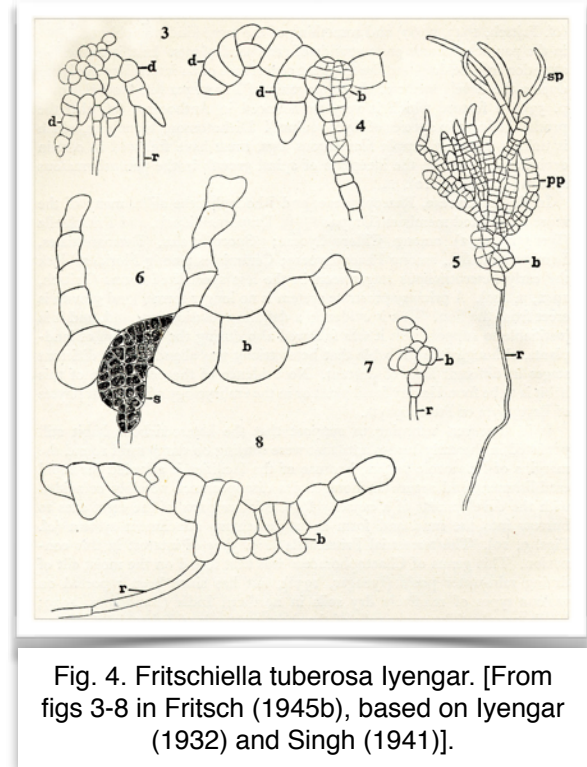


Fig. 4. *Fritschella tuberosa* Iyengar. [From figs 3-8 in Fritsch (1945b), based on Iyengar (1932) and Singh (1941)].

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Michael J. Wynne
University of Michigan, Ann Arbor