

Phycological Trailblazer No. 17 George Frederik Papenfuss

(originally printed in the Phycological newsletter. 2002.
Vol. 38 No. 2)

Two decades have already elapsed since the passing of George F. Papenfuss, and although there are many of us still around who have vivid memories of him as a mentor during our graduate student careers, or as a charismatic personality at meetings or on field trips, or as a significant influence by his scholarly contributions to the broad field of phycology, there is a new generation of phycologists who did not know him. So it seems appropriate to include him as a “phycological trailblazer” in that indeed he was one of the “prominent phycologists” of the 20th century (West, 1996). Because Papenfuss (or “GFP”) has been the subject of several tributes and obituaries (Abbott, 1982; Norris, 1983; Wollaston, 1983), this essay will recall some of Papenfuss’ more off-beat adventures and incidents in his colorful life that I hope will convey a sense of his enthusiastic approach to phycology and to life. Only some of his publications will be cited here, those that are specifically referred to. West (1982) has already provided a complete list of his papers.

Papenfuss was born in 1903 and grew up on a farm in the Orange Free State of the Republic of South Africa. His native tongue was

Afrikaans. He had no exposure to or interest in marine algae during that time. He attended the University of Cape Town but soon dropped out and emigrated to America in 1926. He had a variety of jobs, including selling various products as a door-to-door salesman (Norris, 1983). He regarded this work as essential in improving his ability to use the English language. He started an undergraduate program in agriculture at North Carolina State University in Raleigh, and it was a botany course taught by Larry A. Whitford, a founding member of the Phycological Society of America, that opened up the door to algae. He transferred to botany, earning his B. S. degree (with highest honors).

GFP next embarked upon a graduate degree at Johns Hopkins University in Baltimore. Graduate students at that time were required to

spend their summers at biological stations. He first went to the Mount Desert Island Biological Laboratory in Maine, where he was exposed to marine algae by Duncan S. Johnson, a professor of Johns Hopkins who did research in Maine during the summers (Silva, 1982). The following summers GFP opted for the Marine Biological Laboratory, where he studied algae from various sites in the vicinity of Woods Hole.

He carried out his research on Penikese Island in the Elizabeth Island chain, working at the site of the original MBL before it was relocated to Woods Hole on Cape Cod. More recently, it had served as a leprosarium for the Commonwealth of Massachusetts. The island also had living on it at that time a caretaker and his wife, the only other occupants on the island. It was at the suggestion of his academic supervisor, Prof. Johnson, that GFP undertook the study of



G. F. Papenfuss in Austin, Texas (May, 1976)

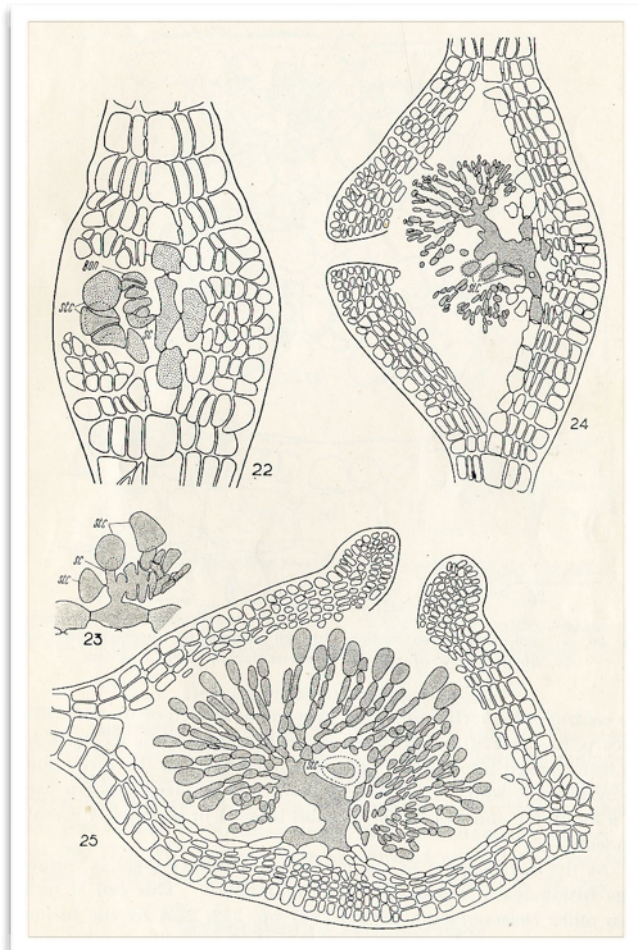


Fig. 1. *Acrosorium acrospermum* (J. Agardh) Kylin. Cystocarpic development. [Figs. 22-25 in Papenfuss, 1939.]

culturing the brown alga *Ectocarpus siliculosus*. Over a three-year period GFP collected material, paying attention to its host(s) and whether the material bore only plurilocular organs or both unilocular and plurilocular sporangia. Around Penikese Island plants bearing plurilocular organs were epiphytic invariably on the host *Chordaria flagelliformis*, and plants bearing both unilocular and plurilocular organs were restricted to the host *Chorda filum*. It was on the former that he recognized that the plants of *Ectocarpus* released swimmers which were sexual (Papenfuss, 1935). GFP later recounted the story of how he was so excited by observing the fusion of gametes that he insisted that the care-taker and his wife come over to his microscope and see for themselves his discovery.

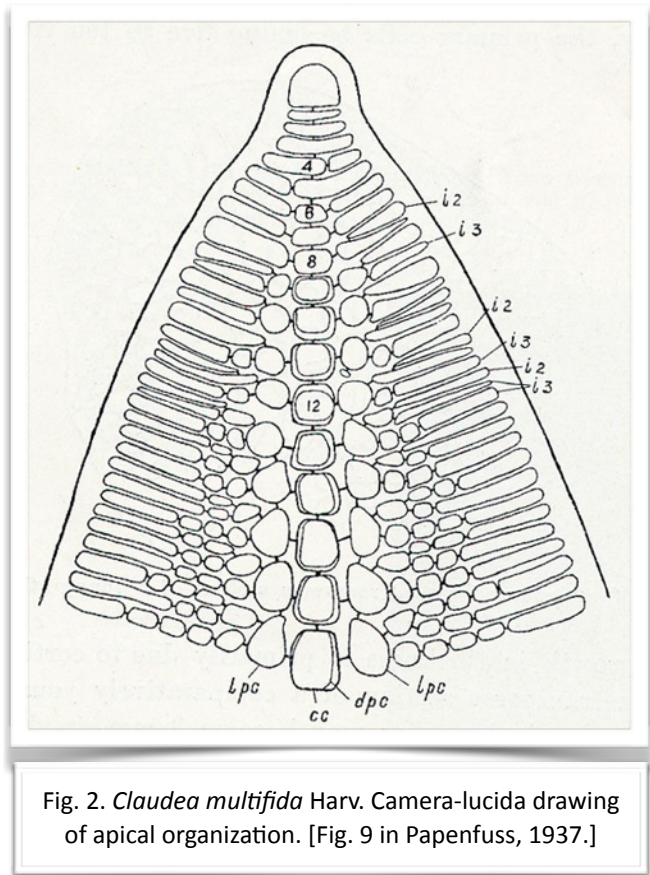


Fig. 2. *Claudea multifida* Harv. Camera-lucida drawing of apical organization. [Fig. 9 in Papenfuss, 1937.]

That same infectious enthusiasm for the algae was to last him his entire life.

While at Johns Hopkins Papenfuss met and married a fellow graduate student, Emma Jean Johnstone, who was to later earn a PhD in Zoology. After receiving his PhD degree in 1933, it was GFP's good fortune to receive a James Buchanan Johnston Scholarship from Johns Hopkins University to continue his studies in Sweden with two major phycological figures of the time, Harald Kylin and Nils Svedelius. He spent 1934 and 1935 studying in Kylin's laboratory at the University of Lund and in Svedelius' laboratory at the University of Uppsala. He was encouraged by Kylin and Svedelius to return to his homeland to make collections. It was in September, 1935, that he returned to South Africa, where he met up with Mary A Pocock (Phycological Trailblazer No. 4), then at the University of Cape Town. In fact, it was Pocock who took GFP on his first two collecting trips, to Strandfontein (False Bay) and Melkbosch (Table Bay), places that could not be

reached by train or bus. Pocock was already familiar with the coastline and knew the best collecting sites. Thus, her collaboration proved critical in insuring that GFP's forays had maximum value. GFP and Pocock went on many collecting trips, including one to St. Lucia Bay in Zululand (now KwaZulu Natal). Some of their samples would later be used for the dissertation research of many of GFP's students: Bob Scagel, Florence Wagner, Paul Silva, K.-C. Fan, Shirley Sparling, Max Hommersand, Rick Searles, Y.-M. Chiang, and Jim Jensen.

With the dark clouds of World War II on the horizon, Mrs. Papenfuss left Sweden for Kansas City, where her mother lived. GFP also decided to head for the relative safety of the States. He made plans to leave by boat from Norway to England, but German U-boats prowling the waters of the North Sea made that escape route too risky. There was a window of opportunity in the late 1930s to leave Europe, but the catch was that the only way out was NOT the obvious way westward but eastward, by train across the expanse of Russia and then across the Pacific, and for the English, across North America and then the North Atlantic to get back to England. So with others caught up in the War, GFP managed to escape Europe, by boarding the Trans-Siberian Railway and riding the rails from Moscow all the way to Vladivostok, its terminus in the east. He related stories about this stressful but exciting adventure and how the spirit of the fellow passengers buoyed up all those aboard. Not deterred by their circumstances, the English boiled up water in the afternoon and served tea on schedule. Finally, in the port city of Vladivostok in easternmost Russia, GFP waited in a harbor to take a ship out for Yokohama, the next leg of his long journey. He later told how he noticed specimens of *Chorda filum*, the distinctive kelp he knew from the North Atlantic and how he felt as if he had run into an old friend. Familiar species of algae can make one feel that way.

By ship GFP eventually reached Hawaii, where he had earlier been offered a temporary appointment as an assistant professor in Botany at the University of Hawaii. This is where his first

graduate students came under his influence, Lois (Eubank) Egerod and Isabella (Aiona) Abbott. His wife also joined him there, and in 1941 their only child, a son Theodore, was born. It was on a Sunday morning, 7 Dec. 1941, in Honolulu that Japanese planes bombed the nearby Navy facility at Pearl Harbor. GFP told how he was taking a shower when Mrs. Papenfuss alerted him as to the bombers flying overhead.

He was awarded a Carnegie Fellowship for two years, which was responsible for his going to the University of California, Berkeley. He arrived in June of 1942, thus overlapping with William A. Setchell until the latter's death the following year. GFP's tenure at UC Berkeley changed from being a Carnegie Fellow to becoming an assistant professor in 1944. The rest of his professional career was on that campus, where he thrived and gained recognition as one of the foremost phycologists of his time. He also mentored a total of 17 PhD students, including a cohort who entered following World War II: Florence (Signaigo) Wagner, Richard Norris, Robert Scagel, and Paul Silva. GFP's contributions included synthetic works such as his chapter on brown algae (1951a), his historical treatment "Classification of the algae" (1955), his summary of phycological advancements (1957), and his "Landmarks in Pacific North American marine phycology" (1976). He reviewed classification of genera within the orders Ulvales (1960) and Dictyotales (1977) and the red algal subclass Florideophycidae (1966). The depth of his grasp of the literature is demonstrated by his catalogue of Antarctic and Sub-Antarctic benthic marine algae (1964) and his catalogue of Red Sea benthic algae (1968b). He maintained a keen interest in the taxonomy of South African algae (1939, 1947, 1952, 1968a)(Fig.1) and in nomenclature (1956, 1958, 1967b). He was a master at detecting problems in phycology (1951b, 1953, 1967a) and in pointing out areas that needed a re-examination (1962). He showed a knowledge of essentially all groups of algae, greens, browns, and reds (1972; Papenfuss & Jensen, 1967; Papenfuss et al., 1982).



Fig. 3. Collecting trip, Pigeon Point, California (April, 1963). (l. to r.: Richard Ellis, Esther Gaw [McLaughlin], Al Loeblich, Jim Jensen, Phil Cook, G. F. Papenfuss, unidentified, Mitsuo Chihara).

Papenfuss thoroughly enjoyed being on field trips (Fig. 3) and having the chance to sample new sites. It was in the latter months of 1962 GFP and his former student Bob Scagel of the University of British Columbia participated in their 2-man expedition in connection with the International Indian Ocean Expedition sponsored by the United States Program in Biology. The adventure got underway in mid-Sept. in Djibouti, French Somaliland, near the "Horn of Africa". They hired a Landcruiser for the long journey, and it came in handy when they had to ford swollen rivers. They also purchased a revolver in case of trouble. By early Oct. they were collecting at Casurina Point near Malindi in Kenya. Next they were at Diani Beach near Mombasa. By mid-Oct. they had reached Dar-es-Salaam, Tanzania, and also Zanzibar Island, where they collected at Chuwani Beach. In early Nov. they were in Mozambique collecting at Xai-Xai and Inhaca Island. Much of Nov. was spent in Natal Prov., South Africa, sampling at such sites as St. Michaels-on-the-Sea, Shelley Beach, and Port Edward. By Dec. 1st they were at Fossil Head, Cape Prov., and then a week later at Sharks Bay, Port Alfred. By mid-Dec. they reached Mungo Bay at Cape Agulhas, the southernmost point on the continent. Eventually

they concluded their expedition at Cape Town. All in all it was an arduous but productive trip.

Papenfuss' legacy includes his scholarly approach to phycology, such as his meticulously detailed papers on *Vanvoorstia* and *Claudea* (1937)(Fig.2), *Taenioma* (1944), and *Caloglossa leprieurii* (1961), the influence he had on a generation of students, and his pivotal role in the establishing the International Phycological Congresses. But he is also remembered for his "joie de vivre", his animated nature featuring a distinctive laugh that could be heard at some distance in the Life Sciences Building on the U. C. campus, and his gregarious nature reflected by his conspicuous and joyful presence at meetings.

Abbott, I. A. 1982. George Frederik Papenfuss (1903-1981). *Br. Phycol. J.* 17: 347-349. Norris, R. E. 1983. A tribute to G. F. Papenfuss. *Trans. Roy. Soc. S. Afr.* 45: 101-105.

Papenfuss, G. F. 1935. Alternation of generations in *Ectocarpus siliculosus*. *Bot. Gazette* 96: 421-446, 2 pls.

_____. 1937. The structure and reproduction of *Claudea multifida*, *Vanvoorstia spectabilis*, and *Vanvoorstia coccinea*. *Symbolae Botanicae Upsaliensis* 2(4). 66 pp.

- _____. 1939. The development of the reproductive organs in *Acrosorium acrospermum*. Bot. Notiser 1939: 11-20.
- _____. 1944. Structure and taxonomy of *Taenioma*, including a discussion on the phylogeny of the Ceramiales. Madroño 7: 226- 231.
- _____. 1947. New marine algae from South Africa I. Univ. Calif. Publ. Bot. 23: 1-16.
- _____. 1951a. Phaeophyta. In: *Manual of Phycology—an Introduction to the Algae and their Biology* (G. M. Smith, ed.), pp. 119-158. Chronica Botanica Co., Waltham, MA.
- _____. 1951b. Problems in the classification of the marine algae. Svensk Bot. Tidskr. 45: 4-11.
- _____. 1952. Notes on South African marine algae. III. J. S. Afr. Bot. 17: 167-188.
- _____. 1953. Outstanding problems in the morphology and taxonomy of the marine algae of the tropical and southern Pacific. Seventh Pacific Science Congress 5: 27-39.
- _____. 1955. Classification of the algae. In: *A Century of Progress in the Natural Sciences 1853-1953*. Pp. 115-224. California Academy of Sciences, San Francisco.
- _____. 1956. On the nomenclature of some Delesseriaceae. Taxon 5: 158-162.
- _____. 1957. Progress and outstanding achievements in phycology during the past fifty years. Am. J. Bot. 44: 74-81.
- _____. 1958. Notes on algal nomenclature IV. Taxon 7: 104-109.
- _____. 1960. On the genera of the Ulvales and the status of the order. J. Linn. Soc. (Bot.) 56: 303-318, 6 pls.
- _____. 1961. The structure and reproduction of *Caloglossa lepieurii*. Phycologia 1: 8-31.
- _____. 1962. Clearing old trails in systematic phycology. Proc. Ninth Pacific Science Congress, 1947, vol. 4 (Botany): 229-233.
- _____. 1964. Catalogue and bibliography of Antarctic and Sub- Antarctic benthic marine algae. Antarctic Research Series Vol. 1: 1-76. American Geophysical Union.
- _____. 1966. A review of the present system of classification of the Florideophycidae. Phycologia 5: 247-255.
- _____. 1967a. Taxonomic and nomenclatural notes on three species of brown algae. Botaniste 50: 319-330.
- _____. 1967b. Notes on algal nomenclature—V. Various Chlorophyceae and Rhodophyceae. Phycos 5: 95-105.
- _____. 1968a. Notes on South African marine algae: V. J. S. Afr. Bot. 34: 267-287.
- _____. 1968b. A history, catalogue, and bibliography of Red Sea benthic algae. Israel J. Bot. 17: 1-118. [Reprinted, Contr. Knowledge of the Red Sea Bulletin No.42.].
- _____. 1972. On the geographical distribution of some tropical marine algae. Proc. International Seaweed Symp. 7: 45-51.
- _____. 1976. Landmarks in Pacific North American marine phycology. In: *Marine Algae of California* (by I. A. Abbott and G. J. Hollenberg), pp. 21-46. Stanford University Press, Stanford, California.
- _____. 1977. Review of the genera of Dictyotales (Phaeophycophyta). Bull. Japanese Soc. Phycol. 25 (Suppl.): 271-287.
- Papenfuss, G. F., & J. B. Jensen. 1967. The morphology, taxonomy, and nomenclature of *Cystoseira trinode* (Forsskål) J. Agardh and *Cystoseira myrica* (S. G. Gmelin) C. Agardh (Fucales: Cystoseiraceae). Blumea 15: 17-24.
- Papenfuss, G. F., K. E. Mshigeni, & Y.-M. Chiang. 1982. Revision of the red algal genus *Galaxaura* with special reference to the species occurring in the western Indian Ocean. Bot. Marina 25: 401-444.
- Silva, P. C. 1982. George Frederik Papenfuss. Taxon 31: 613-615.
- West, J. A. 1982. Prof. Dr. George Frederik Papenfuss November 4, 1903 - December 8, 1981. Bot. Marina 25: 289-293.
- _____. 1996. George Frederik Papenfuss (1903-1981). In: *Prominent Phycologists of the 20th Century*. (D. J. Garbary & M. J. Wynne, eds.), pp. 149-157. Lancelot Press Ltd., Hantsport, Nova Scotia.
- Wollaston, E. M. 1983. George Frederik Papenfuss November 4 1903 - December 8 1981. Phycologia 22: 337.

Michael J. Wynne
University of Michigan