Meetings

Seaweed Symposium

The 4th international symposium on various aspects of marine algae was held in Biarritz, France, from 18 to 24 September 1961. The earlier symposia had been held in Edinburgh in 1952, Trondheim in 1955, and Galway in 1958. At the fourth symposium the participants numbered 222 and 27 different countries were represented. There were concurrent sessions for the presentation of original research on the general biology of seaweeds and on their chemistry and utilization. Many aspects of these subjects were discussed, such as anatomy, ecology, laboratory culture, taxonomy and life histories, methods of measuring natural distribution, chemical composition, and specific applications. There were surprisingly few papers on the technology of extraction.

The symposium was opened officially by M. Fontaine, director of the Oceanographic Institute in Paris. All meetings were held in the municipal casino, a unique setting for a scientific congress. Three formal lectures were delivered during the conference—by Elizabeth Percival (Edinburgh), on algal polysaccharides; by L. Provasoli (New York), on the techniques of laboratory culture; and by Davy de Virville (Paris), on the distribution of marine algae on the Atlantic coast of France. Films were shown of the reproductive stages of *Prasiola stipitata*, by Friedmann (Jerusalem), and of fertilization and development in *Nereocystis luetkeana*, by Scagel (Vancouver). During the congress opportunity was provided for the botanists to make collecting excursions to the Basque coast around Biarritz, under the guidance of Dangeard (Bordeaux).

About 40 papers were presented to the botanical section. Hydrographic and topographic data, as related to algal distribution and associations, were discussed. Artificial cultural media for seaweeds were described as satisfactory for 15 species of *Sphacelaria* but inadequate for two species of *Ulva*. The influence of iodine and arsenic on a red alga was discussed. The results of culturing two species of *Porphyra* indicated an *Achrochaetium*-like stage in the life history of one of them.

Experimental studies with *Fucus vesiculosus* showed that different regions of the thallus exhibit a differential wound-healing and regenerative response. The ecology of *Laminaria hyperborea* on a rocky coast of the Isle of Man was described. Plants of the same age were smaller at greater depths, and the growth rate was affected by the amount of light available.

Photosynthesis and growth in *Macrocystis pyrifera* in California, as well as experimental transplantation of this species, were described in considerable detail. Identification of particles of seaweed meal with respect to species and organ has been made possible through an anatomical investigation of species of Laminariales and Fucales.

About 30 communications were presented to the section on chemistry and utilization. Andersen (Halle) described the power of carrageenin to suspend cocoa in milk as due to a thixotropic gel formed by interaction of the ionic sulfate groups of carrageenin with casein as a three-dimensional reticulum. Dillon (Galway) discussed the constitution of the laminarans and supported the view that two such polysaccharides exist: (i) laminaritol, nonreducing and containing mannitol, and (ii) laminarose, reducing and containing only D-glucose. The mechanism of sulfation of polysaccharides in algae was clarified by Fogarty and Rees (Glasgow) with the evidence that an enzyme exists in plant tissues which can bring about this reaction with 3′-phosphoadenosine-5′-phosphosulfate.

Haug and Larsen (Trondheim) presented further evidence of the heterogeneity of natural alginate through quantitative separation of the constituent uronic acids by an electrochromatographic method. Two papers were read which showed that seaweeds in various forms can act as a fertilizer, mainly because of the presence of trace elements, and also as a soil conditioner. Jensen (Trondheim) made an estimate of the ascorbic acid in rockweeds and found a seasonal variation, with a maximum in early summer and a minimum in mid-winter.

Laur (Paris) reported further analyses of the lipids in the Rhodophyceae by separation of the methyl esters of the fatty acids in gas chromatography. The presence of highly unsaturated acids from C_{14} to C_{22} in considerable amount was demonstrated. Manners (Edinburgh) has studied the characteristics of the amylase in *Cladophora rupestris*. He found it unstable and difficult to purify. It resembled α-amylase in its activity. Percival (Edinburgh) described further work on the heteroglycans of *Ulva* and *Enteromorpha* found in the residue after aqueous extraction. This contained L-rhamnose (35 percent), D-glucose, D-xylose, D-glucuronic acid (18 percent), and sulfate (16 percent). Heterogeneity was shown by passage through a column of diethylaminoethanol (DEAE) cellulose, but the three fractions obtained differed only in their intrinsic viscosity. Oxidation with periodate and infrared spectroscopy indicated that the sulfate was mainly attached to C_2 of rhamnose and that the latter constituted a 1→3 linked chain with side chains of glucuronic acid attached 1→4 to rhamnose.

Turvey and Williams (Bangor) have examined the polysaccharide from *Porphyra umbilicalis* which contains D- and L-galactose, 3,6-anhydro-L-galactose and 6-O-methyl-D-galactose as a sulfate ester. A partial hydrolyzate contained L-galactose-6-sulfate, free and in the form of disaccharides which also contained either D-galactose or 6-O-methyl-D-galactose.

Merritt, Katsuura, and Young (Halifax) described the construction and operation of a semicontinuous dryer of original design for Irish moss. With steam at pressures up to 90 pounds per square inch and an air flow up to 80 pounds per minute per square foot, temperatures up to 200°F could be used without appreciable degradation of the extractable carrageenin.

H. A. Hoppe (Hamburg) stressed the desirability of establishing some center of information for the seaweed industry. J. Seere (Casablanca) strongly

supported the suggestion as particularly applicable to the collection of data on resources and on methods of harvesting, and of laws or regulations governing harvesting. At the closing session of the symposium this took the form of a motion that the U.N. Food and Agriculture Organization be requested to undertake this project, as it had undertaken the publication of an international list of those concerned with study of algae and the collection of statistics on the utilization of aquatic plants. The suggestion was welcomed by M. Ruivo (Rome), delegate from the Food and Agriculture Organization.

Abstracts of the communications were supplied in mimeographed form, and the papers will be published in full at a later date. The national committee was under the chairmanship of Davy de Virville; M. Barriety (Biarritz) served as secretary. The next symposium will be held in Halifax in 1964.

The International Phycological Society held its organization meeting at the conclusion of the symposium.

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Forthcoming Events

April

19–21. Southern Soc. for Philosophy and Psychology, Memphis, Tenn. (D. R. Kenshalo, Dept. of Psychology, Florida State Univ., Tallahassee)

20–21. Pennsylvania Acad. of Science, Pittsburgh. (K. B. Hoover, Messiah College, Grantham, Pa.)

20–22. Czechoslovak Soc. of Arts and Sciences in America, 1st natl. congr., Washington, D.C. (M. Rechcigl, Jr., 1703 Mark Lane, Rockville, Md.)

21–21 Oct. World's Fair of Science, Century 21 Exposition, Seattle, Wash. (J. Rockey, c/o Seattle World's Fair, Seattle)

22–26. Association of American Geographers, Miami Beach, Fla. (M. F. Burrill, AAG, 1785 Massachusetts Ave., NW, Washington, D.C.)

23–25. Canadian Inst. of Mining and Metallurgy, annual, Ottawa, Ont. (C. Gerow, CIMM, 1117 St. Catherine St., W. Montreal 2, Quebec, Canada)

23–25. Meteorological Uses of Rockets and Satellites, symp., Washington, D.C. (World Meteorological Organization, 41, Avenue Giuseppe Motta, Geneva, Switzerland)

23–25. Pan American Congr. of Gastroenterology, New York, N.Y. (C. A. Flood, 180 Fort Washington Ave., New York 32)

23–26. American Physical Soc., Washington, D.C. (K. K. Darrow, APS, Columbia Univ., New York 27)