

# THE PHYCOLOGICAL SOCIETY OF AMERICA

*'Ipse super maria fundavit eum.' Psalms.*

Volume VIII

News Bulletin, March, 1955

Number 23

P. C. SILVA, Editor and Secretary

## THE GAINESVILLE MEETING

### MINUTES

The ninth annual meeting of the Society was held on Tuesday, September 7, 1954, at the University of Florida, Gainesville. The business meeting was called to order at 4:00 p.m. following presentation of papers in Room 239 of the Administration Building. President Ruth Patrick presided.

Minutes of the eighth annual meeting were approved as circulated to members in the News Bulletin (Vol. VII, No. 21).

### Old Business

#### *Membership Committee*

Dr. C. M. Palmer, chairman, reported that results in the membership drive had been good, but that continued cooperation of all members is needed. A motion was passed instructing the committee to continue its efforts in securing additional members during the coming year.

#### *News Bulletin*

Following considerable discussion by various members, a motion was passed instructing President Ruth Patrick to appoint a committee to look into the matter of the News Bulletin and the possibility of Proceedings of the Society with the idea of stimulating interest in the Society through more effective use of its publications. This committee was to be instructed to poll the membership and report its recommendations to the new president. The poll of the membership was to be completed by January 31, 1955. A committee was appointed, comprising Drs. E. T. Moul (chairman), W. A. Daily, H. Forest, and L. Provasoli.

#### *Journal Committee*

A report was read which had been prepared by the Journal Committee consisting of Drs. P. C. Silva (chairman), R. A. Lewin, and W. R. Taylor. This report is given below:

“During the past eight months results of the poll have continued to be received. Few, if any, additional replies can be expected. Only 128 members, or 50% of the membership, replied, a rather discouraging response. Of those who sent replies, 17 out of 97 American members and 7 out of 31 foreign members indicated that they would not subscribe. An analysis of

the 104 favorable replies, representing a total of 104 personal and 80 institutional subscriptions, yields the following expected financial schedule:

Annual subscription rate	Number of subscribers	Income
\$10.00	111	\$1110
9.00	114	1101
8.00	124	1142
7.50	135	1200
7.00	148	1261
6.00	167	1302
5.50	170	1272
5.00	177	1259

This analysis indicates the most favorable return at a personal subscription rate of \$6.00 with a somewhat higher institutional rate. This expected return amounts to slightly more than half the sum that would have to be guaranteed before publication of the journal could be considered feasible. Publication of a journal at this time is therefore considered impracticable unless supporting funds can be obtained from an outside source."

#### *Treasurer's Report*

In the absence of Dr. R. D. Wood, the Treasurer's report was read by Dr. C. M. Palmer. The report includes the period from August 25, 1953, through May 26, 1954.

Balance on hand, Aug. 25, 1953.....	\$1106.84
Income to May 26, 1954.....	208.25
Total.....	1315.09
Expenditure to May 26, 1954.....	68.18
Balance on hand, May 26, 1954.....	1246.91
Present allocation of funds:	
Savings Account, Phycological Society of America, Union	
National Bank, Wakefield, R. I.....	865.17
Checking Account, Phycological Society of America, Union	
National Bank, Wakefield, R. I.....	314.66
Checks, not yet deposited.....	55.00
Petty funds, held by Secretary R. H. Thompson.....	11.93
Stamps.....	0.15
Total.....	1246.91

A motion was passed accepting the Treasurer's report.

The President urged members to send their dues to the Treasurer in spite of failure to receive official notification that they were due.

#### *President's Report*

The President reported that during the year the following committees were either appointed or asked to continue their work:

Journal Committee (continued): P. C. Silva (chairman), R. A. Lewin, W. R. Taylor.

Membership Committee: C. M. Palmer (chairman), H. T. Croasdale, J. Myers, G. F. Papenfuss, W. E. Wade.

Nominating Committee: R. C. Starr (chairman), C. MacFarlane, E. Y. Dawson.

Eighth International Botanical Congress, Paris: W. R. Taylor (delegate), P. C. Silva (alternate), R. H. Thompson (alternate).

Committee for Local Arrangements, Annual Meeting, Gainesville: H. J. Humm.

Press Representative for Gainesville Meeting: E. T. Moul.

Representative on A.A.A.S. Council, December 1954, Berkeley: G. F. Papenfuss.

The American Institute of Biological Sciences requested a card file of membership of the Society and a set of envelopes addressed for use by the National Register of Scientific and Technical Personnel. The President reported that this request had been complied with.

#### *New Business*

The President noted the great loss to phycology in the death of Professor F. E. Fritsch on May 23, 1954. Mr. John Wallace was asked to prepare a resolution expressing the sympathy of the Society, the resolution to be sent to Mrs. Fritsch through the new secretary.

The President read a letter requesting the appointment of a delegate to the International Arid Lands Meetings to be held in Albuquerque, N. M. in 1955. No action was taken.

A motion was passed that the tenth annual meeting be held with the A.I.B.S. at Michigan State College in September 1955.

#### *Eighth International Botanical Congress*

Dr. Luigi Provasoli gave a short report on various items of interest concerning the Botanical Congress which met in Paris, July 2-14, 1954. He reviewed some interesting papers and said that he thought the Congress was most successful. Drs. Forest, Lewin, Nielsen, Papenfuss, Provasoli, Silva, Taylor, and Thompson were the American phycologists at the Congress.

#### *Nominating Committee*

The following officers were elected on the basis of ballots sent to the membership in June:

Dr. G. W. Prescott, Michigan State College.....	President
Dr. H. C. Bold, Vanderbilt University.....	Vice-president
Dr. P. C. Silva, University of Illinois.....	Secretary
Dr. R. D. Wood, University of Rhode Island.....	Treasurer

A motion was passed that the Society express its appreciation to Dr. H. J. Humm, who acted as local representative and was responsible for seeing that arrangements for the meeting were completed, and to Dr. L. A. Whitford, for the organization of field trips.

As there was no further business, the meeting was adjourned.

Respectfully submitted,

RICHARD C. STARR,  
Acting Secretary.

#### ABSTRACTS OF PAPERS

### Observations on an Apparently Undescribed Ulotrichalean Alga

Harold C. Bold and Richard C. Starr

The authors report the occurrence of an apparently previously undescribed member of the Chlorophyceae, a ulotrichalean organism, from limestone pools and standing water in a field in the cedar glades about 15 miles southeast of Nashville, Tennessee, where it occurred in 1950 and 1954. The organism has been isolated into unialgal culture and grows well in soil-water medium and on agar. The plant consists of a network of anastomosing, cylindrical, gelatinous tubes which are secreted by the branching, in part multiseriate, filaments they enclose. Growth of these filaments is apical. The cells are uninucleate and contain laminate chloroplasts usually with a single pyrenoid. Dissociation into akinete-like cells has been observed. In reproduction, in nature and in culture, each cell divides to form two biflagellate swimmers which function as isogametes. The zygospores enlarge markedly and germinate after a dormant period into four motile cells. Further study and formal description of the organism are projected.

### Algae in the Giant Springs of Florida

L. A. Whitford

As indicated by algal flora and water quality there are the following types of springs in Florida: hard, fresh-water; oligohaline; mesohaline; sulfur. Two other types probably occur: soft, fresh-water; mesohaline sulfur.

The dominant algal community in all springs studied is a lotic aufwuchs (periphyton). Diatoms are generally most abundant except in the sulfur springs where blue-green algae are the chief dominants.

The following algal communities are recognized:

1. the *Cocconeis-Stigeoclonium* community of hard, fresh-water springs;
2. the *Cladophora-Cocconeis-Enteromorpha* community of oligohaline springs;

3. the *Enteromorpha-Lyngbya-Licmophora* community of mesohaline springs;
4. the *Phormidium-Lyngbya* community of sulfur springs.

The importance of current in constantly renewing minerals and gases at the plant surfaces is recognized.

### Tropical Marine Algae

Robert H. Williams

Typical tropical marine algae are shown growing in several characteristic habitats in south Florida in a colored motion picture. Unique features of this flora include the abundance of coenocytic and calcareous green algae.

### The Lyophilization of Some Algae

W. A. Daily and J. M. McGuire

The lyophile process was investigated as a means of preserving in a desiccated state 32 cultures of algae. Seventy-five per cent survived lyophilization. These remain on periodic viability tests, and when cultured recently at from four to ten months after lyophilization they were still viable.

### A Preliminary Report on a Cytological Investigation in *Spirogyra*

Ann Allen

Studies of complete life histories of certain strains of *Spirogyra* are in progress in an effort to understand variations in filament width and plastid number that have occurred in culture. From a clonal culture in soil-water medium there have arisen at least three different width types of *Spirogyra*. Reisolations of single filaments of Type 1, the smallest, result in cultures again showing the three different width types. Reisolations of filaments of Types 2 and 3 result in cultures which maintain their respective filament widths. In so far as staining of mitotic divisions has as yet offered no clear explanation for the variation, stages of the life cycle are being investigated for possible contributions to the variation. Techniques have been developed for inducing conjugation, zygospore production, and zygospore germination for the cultured types. There is indication of more variation in filament width subsequent to zygospore germination. Studies of meiosis and further analyses of zygospore germings are now being undertaken.

### General Features of Algal Growth in Sewage Oxidation Ponds

M. B. Allen

Oxidation ponds have been in use for a number of years as a secondary sewage treatment process. In these shallow lagoons the organic matter of sewage is oxidized as a result of the combined growth of algae and bacteria in sunlight. In some northern California ponds *Chlorella* was found to be

the dominant alga, regardless of the season or the conditions of plant operation. *Scenedesmus* was next in numbers, particularly in the later stages of the ponding process. Various other algae were found in small numbers, especially around the edges of the ponds, but were not sufficiently numerous in the pond as a whole to play an important role in the purification process.

Neither *Chlorella* nor any of the other algae isolated from oxidation ponds could grow in the dark on sewage, nor was the content of oxidizable organic matter in sewage decreased by the growth of pure cultures of these algae in the light. It was therefore concluded that the role of photosynthetic algae in the ponding process is solely that of furnishing oxygen which is used by bacteria (and other colorless organisms) to oxidize the organic matter. This bacterial oxidation, in turn, provides carbon dioxide which is used for algal growth.

Experiments in which the intensity and duration of light were varied indicated that growth of *Chlorella* in sewage was limited by some nutrient or nutrients in the sewage, rather than by external physical conditions. Even when additional carbon dioxide was supplied, growth stopped before all the nitrogen of the sewage had been utilized. Since virtually all the nitrogen had been converted to ammonia by bacterial action, it would have been readily utilized by *Chlorella* if some other factor were not limiting. Sewage as a nutrient medium for algae is being investigated further.

#### First Conclusions from a Jump at *Stigeoclonium*

Herman S. Forest

In a study of *Stigeoclonium*, attention has been directed toward the evolution of that genus and related genera in the Chaetophoraceae and Ulotrichaceae in order to furnish an approach to the difficult systematics of the group. The development of gelatinous sheathing, chloroplast structure, and branching seems to form a pattern throughout the group of genera studied. Uncertain gelatinization, irregular branching, and flat or slightly curved chloroplasts are considered primitive characters, while distinct gelatinization, patterned branching, and ringed chloroplasts are considered derived. Intermediates can be found through much of the system which tend to link recognized genera. Possible intermediates can be found between *Stigeoclonium* and both *Draparnaldia* and *Chaetophora*. In *Stigeoclonium* itself there are so many intermediate forms that the genus would appear to contain few separable entities.

#### New and Interesting Algae from South Australia

Ivan L. Ophel

Three new species of Chlorophyta from South Australia are described and illustrated, representative of *Chlamydomonas*, *Wislouchiella*, and *Sphaerellopsis*.

*Wislouchiella planctonica* Skvortzow, *Draparnaldiopsis alpina* Smith & Klyver, and *Chlorotylum cataractum* Kütz. are recorded from Australia and the Southern Hemisphere for the first time. The occurrence of the "rare" diatom *Attheya zachariasii* Brun in four of the water supply reservoirs of Adelaide is of interest. Concentrations of 27 million cells per liter have been attained.

#### A rare *Tolypella* new to the United States of America

Fay Kenoyer Daily

In a small lake near Laramie, Wyoming, Dr. C. L. Porter of the University of Wyoming recently collected a *Tolypella* which appears to belong to the dioecious *Tolypella hispanica* Nordst. This is a rare species new to the United States of America. The Wyoming collection is considered a new variety of this species on the basis of comparative studies with the holotype of *T. hispanica* and with a collection of *T. hispanica* var. *microcephala* Nordst.

#### The Diatom Flora of Bethany Bog, Connecticut

Ruth Patrick

The results of these studies indicate that the first diatom flora developed at the 13-meter level. The flora at 12 meters increased. At the 11- and 9-meter levels the lake became increasingly eutrophic. Both plankton and benthic forms were present. At the 8- and 7-meter levels the lake was in a transitional stage from lake to bog conditions. From 6 meters to the surface bog conditions were present. These findings support those of Vallentyne on pigment studies.

#### Culture of *Trachelomonas* in Chemically Defined Media

L. Provasoli and I. J. Pintner

The organism was found in a water-lily pond and isolated bacteria-free. E. G. Pringsheim is studying its morphology.

Preliminary work shows that this *Trachelomonas* has many nutritional characters in common with the *Euglena* group, such as the need for B<sub>12</sub>, heterotrophy, and low calcium requirements. *Trachelomonas*, however, has a far lower and narrower tolerance to nutrients, probably a reflection of its need for dilute media.

Fixed carbon sources such as acetate increase growth in stagnant cultures; acetate was effective at a concentration of 10-30 mg. between pH 5.0 and 7.0. Addition of glucose to acetate favors growth especially in acid media. *Trachelomonas*, as compared to other organisms requiring low total solid concentrations, has a relatively high tolerance toward phosphates: 25 mg. % of Na phosphate was not inhibitory. NH<sub>4</sub> is an excellent

N- source (3-7 mg. % calculated as free  $\text{NH}_3$ ) as are several amino acids. Magnesium is needed in large amounts (2-4 mg. % of Mg for 0.5 mg. % of Ca) and is only partially substituted by Ca.

Like other euglenids, *Trachelomonas* needs cyanocobalamin; the addition of thiamine prolongs motility and survival for several months. The pattern of  $\text{B}_{12}$  specificity is, so far, identical with the one of *Euglena gracilis* var. *bacillaris*: "pseudovitamin  $\text{B}_{12}$ " and "Factor A" are active while "Factor B" cannot replace cyanocobalamin. Our results confirm and explain those reported by Pringsheim with *Trachelomonas hispida*, *T. lefevrei*, and *T. zorensis*. He found that mineral media did not support growth; the addition of soil extract and of small quantities of Fe and Mn was necessary. Soil extract is a good source of several vitamins, especially cyanocobalamin.

The reported meager growth of these species in his aseptic media may be due to a lack of utilizable carbon sources, which were released in the bacterized soil-water cultures by microbial action on starch. Our species grows only moderately without carbon sources in stagnant cultures. *Trachelomonas volvocina*, *T. oblonga*, and other *Trachelomonas*, which did not grow in his media, may be even more dependent upon heterotrophy and have more complex and exacting requirements.

In our media *Trachelomonas* reaches 400,000 cells per ml. and maintains its envelope, but the brown secondary deposit of Fe and Mn, so typical of the forms found in nature, is absent. Our first medium contained ethylenediamine tetra-acetic acid (EDTA); in presence of 20 mg. % of this metal-binder growth occurred only after addition of 1-2.5 mg.% of Zn, 0.4-1.0 mg.% of Mn, small quantities of Cu and 0.1 mg.% of Fe. The necessity for high quantities of the metals which are more avidly chelated probably reflects the need to keep the major elements unbound and available to the cells. If EDTA is substituted by a small quantity (2.0 mg.%) of citric acid, a weaker chelator, the need for trace metals is drastically reduced. Additions of more Fe, Mn, and Zn to this weakly chelated medium were tolerated, but failed so far to produce the typical metal deposits on the envelope. Other conditions besides the quantity and form in which some heavy metals are present seem to be necessary for the deposition of the metallic secondary envelope.

#### ANNOUNCEMENT

The Darbaker Prize Committee of the Botanical Society of America will accept nominations until April 15 for an award to be made for meritorious work in the study of algae, particularly microscopic algae. For further details see *Science* (Jan. 28, p. 128).

Wm. Randolph Taylor, Chairman

2. 8. 85

