THE PHYCOLOGICAL SOCIETY OF AMERICA

Volume XV News Bulletin, February, 1962 Number 1

BY-LAW CHANGE PASSED

By an overwhelming majority of those voting, the change in By-law 5 was approved. This change calls for a substantial increase in dues and the addition of the sustaining and institutional membership class. Over 300 ballots were mailed, and 163 replied in favour of the change, with 14 opposed. Thus 92% of those voting approved the change. Although only 58% of the membership voted, those in favour equal 54% of the total membership. Therefore, a slight majority of the members are in favour of the resultant dues increase.

For the past 5 years, the cost of printing the News Bulletin has exceeded the amount received from dues, sale of reprints, and bank interest. At the 1961 Purdue meeting it was evident that if the Society were to maintain itself that an increase in revenue, primarily dues, was essential. With membership exceeding 300, an increase in dues from $2 to $4 per year would equal publication costs. At the same time, it was considered essential for the Society to become a member of the American Institute of Biological Sciences, the group that helps arrange the annual meeting. Full membership in AIBS is $1 a year per person and entitles each member to receive 5 issues of the AIBS Bulletin, including the meeting-issue in which all papers are listed. Therefore, the approval of By-Law 5 raises individual memberships to $5 per year; and adds sustaining and institutional memberships at $10 per year.

EDITORIAL

If the Society and its NEWS BULLETIN are to grow and expand, it is necessary that the membership must also grow. As mentioned previously, the main source of revenue is the dues. The sale of reprints, interest on savings, and profits from the 1950 symposium, *Culturing of Algae,* constitute a minor part of the yearly receipts. There are no organizations, government or private, subsidizing the Society. Sale of the past volumes of the NEWS BULLETIN will only bring in a small amount.

NOW IS THE TIME FOR ALL MEMBERS TO COME TO THE AID OF THEIR SOCIETY. Now is the time to increase the membership. Now is the time to get your library or organization to subscribe to the NEWS BULLETIN. Now is the time for you to contemplate completing your set. Now is the time for your library to have a complete set.

Enclosed in this issue is an application form. *Please,* give it to an interested non-member and urge him (or her) to join immediately. Extra copies are available from the members of the Executive Committee. If the membership doubles, so will the News Bulletin and the effectiveness of the Society.

Few libraries subscribe to the NEWS BULLETIN. It is up to you to urge that your library subscribe. Will you please do this immediately? Past issues, from volume 8 (1955) to present are available at $2 a year. Plans for reprinting the first 8 volumes are being made. Orders for the past volumes should be made directly to the Editor, and immediately, as prices will probably be raised.

Finally dues should be paid promptly. Enclosed also is your statement. Sixty people still owe for 1961. This is $120 which is almost half the cost of a number of the NEWS BULLETIN. With the by-law change, members will be dropped 3 months after the second dues notice, which means that if payment for 1962 is

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MEETINGS OF INTEREST TO PHYCOLOGISTS

22-24 FEBRUARY—Genetics Society of Canada, Winnipeg, Manitoba (Science Liaison Office, NRC, Sussex Dr., Ottawa 2).

16-20 APRIL—Shellfish Sanitation, Robert A. Taft Sanitary Engineering Center, 4676 Columbia Pkwy., Cincinnati 26, Ohio.

18-29 JUNE—Aquatic Biology for Engineers, Robert A. Taft Sanitary Engineering Center, 4676 Columbia Pkwy., Cincinnati 26, Ohio.

25-27 JUNE—1st International Conference on Wildlife Disease, Sha-wan-ga Lodge, High View, New York (AIBS, 2000 P St. NW, Washington 25, D.C.).

13-16 AUGUST—3rd Symposium on Biological Problems in Water Pollution, Robert A. Taft Sanitary Engineering Center, 4676 Columbia Pkwy., Cincinnati 26, Ohio (C. H. Tarzwell, Chief Aquatic Biology).

20-25 AUGUST—15th International Congress of Limnology, University of Wisconsin, Madison (Dr. J. C. Wright, Birge Hall, University of Wisconsin).

19-24 AUGUST—8th International Congress for Microbiology, Montreal, Canada (Secretariat, 3574 University St., Montreal).

26-31 AUGUST—17th Annual Meeting PHYCOLOGICAL SOCIETY OF AMERICA, Oregon State University, Corvallis (with the AIBS, 2000 P St. NW, Washington 25, D.C.).

not received by about August, you will be dropped. It will no longer be possible to receive *gratis* copies of the NEWS BULLETIN for 1½ years after last payment of dues.

Plans are underway to establish an Editorial Committee. It is hoped to present the new Editorial Policy in the next issue. The interest shown in the Society and the NEWS BULLETIN in the past year has been gratifying. Now, to help the Society grow and to continue to show your interest, please pay your dues, enlist new members, and encourage your library to be a subscriber.

DEADLINES

BOTANICAL SOCIETY OF AMERICA

1 June—Darbaker Prize in Phycology nominations due. Letter stating merits of the candidate and copies of reprints should be sent to P. C. Silva, Botany Department, University of California, Berkeley.

NATIONAL INSTITUTES OF HEALTH: Bethesda 14, Maryland.

28 February—Research grant request proposals due. Special form available.

31 May—Renewal of Research Grant Requests Proposal. Special form sent to those eligible.

NATIONAL SCIENCE FOUNDATION: 1201 Constitution Ave., Washington 25, D.C.

15 February—Applications to Summer Institutes for Science, Mathematics, and Engineering Teachers. Applications should be sent to institution involved.

1 March—Supplementary Training for Science Teachers Program Proposal.
—Inter-Institutional Associations Proposal.
—Supplementary Science Projects for Students Proposal.
Information: Special Projects, Division of Scientific Personnel and Education.

15 May—Basic Research Proposals, Life Sciences. Information: Biological and Medical Sciences Division.

1 July—High School and College Teachers Academic Year Institute Proposals, 1963-64. Information: Institutes Section, Division of Scientific Personnel and Education.

TEMPERATURE TOLERANCE OF ALGAE IN DRY SOIL

F. R. Trainor
University of Connecticut, Storrs

There have been a number of reports concerning the longevity of algal cells in soils (Bristol, 1919; West and Starkey, 1915; Fritsch, 1936). Because of their resistance to desiccation, algae have been obtained repeatedly from air-dry soil samples during investigations of the soil algal flora. Such samples afford the investigator an abundant supply of algal types from resistant and, sometimes, thick-walled spores. Fritsch (1922) indicates that ordinary vegetative cells, without thickening of the wall, can survive in dry soil. Inasmuch as zygospores can apparently live for months in the dry state, air-dry samples have been employed in screening soil samples for sexual organisms.

The present information was obtained while attempting to isolate sexual forms from a corn-field soil sample from Storrs, Connecticut. In an effort to accelerate the drying out of soil samples, and eliminate vegetative cells, oven drying was introduced. After drying one gram soil samples at temperatures up to 100° C. for one hour and subsequent incubation in nutrient solution at room temperature under continuous illumination, algal growth was obtained in every case. These results then led to experimentation concerning the temperature resistance of algal cells in dry soil.

One gram samples were placed in aluminum pans and subjected to temperature treatment. Duplicate samples were then dried at temperatures of 100, 110, 120, 130, 140, 150 and 160° C. for one hour. After cooling to room temperature, the samples were placed individually in 100 ml. of I-N medium (Trainor, 1958) in 8 oz. soft-glass Blake bottles. These were then incubated at 26° C. and 34° C. under continuous fluorescent illumination. An untreated control soil sample was included in all cases. The procedures were repeated twice; in one replicate, samples from small home gardens in Pennsylvania and Maryland were included for comparison.

After 10 days, luxuriant algal growth was noted in bottles which contained soil samples previously oven-dried at 130° C. for one hour. Excellent growth was also obtained when lower oven-drying temperatures were used; no growth was obtained when higher temperatures were employed. (In both the Maryland and Pennsylvania soil samples, the upper limit of the drying temperature was higher, 140° C., but no organisms were isolated or identified.) In approximately half of the bottles, when temperature pre-treatment was followed, initial growth was evident two or three days sooner than in the control. This could be explained by the stimulation of spore germination with high temperature during drying.

Attempts were made to isolate at least some of the organisms which could resist these high temperatures in the dry state. Two *Chlorella* species, two *Chlamydomonas* species, two *Chlorococcum* species and an *Anabaena* were isolated and identified from those bottles which contained soil previously dried at 100° C. for one hour. In addition to those previously listed, the following organisms were present in the control bottles: a second *Anabaena*, two additional *Chlorococcum* species, a representative of the genus *Spongiochloris* and the genus, *Scenedesmus*. In all bottles which contained soil previously dried at 130° C., only a large *Chlorella* was present.

Some of the "temperature-resistant" species grow very well at high temperatures, e.g. at 38°C. for one *Chlamydomonas* and one *Chlorococcum*. However, survival of cells in the dry state after temperature treatment does not necessarily mean later growth at high temperatures, or rapid growth rates. This can be

borne out by the fact that some "temperature-resistant" species will not grow at 38°C. and that at least one organism from the control, *Spongiochloris* sp., grows well at that temperature.

Temperature treatment of wet or moist soil samples was not employed. No attempt has been made to determine at what temperature each organism is killed in the dry state. However, it appeared that perhaps somewhat more than one hour would be more effective in sterilizing the dry soil samples. Thus one half gram sample was dried at 100°C. for 24 hr. and then incubated in nutrient solution; a small *Chlorella* species survived. This resistance to desiccation could certainly carry such a species over the most trying conditions of extreme temperatures and lack of water. It is thus no surprise that algae have survived in dry soil samples for many years. It is interesting, though, that the most resistant species found in this soil is a *Chlorella* and not one of the blue-greens, which apparently hold longevity records.

In addition, the fact that it has been demonstrated that algal species can tolerate rather high temperatures in the dry state leads one to be more cautious in dry sterilization of glassware, other containers and soil for later experimentation at lower temperatures.

This study was aided by funds from NSF Grant G 16106.

BRISTOL, B. M. 1919. On the retention of vitality by algae from old stored soils. New Phytologist 18: 92-107.

FRITSCH, F. E. 1922. The moisture relations of terrestrial algae. I. Some general observations and experiments. Ann. Bot. 36: 1-20.

————. 1936. The role of the terrestrial algae in nature. *In* Essays in Geobotany. T. H. Goodspeed, Ed. pp. 195-217. Univ. Calif. Press.

TRAINOR, F. R. 1958. Control of sexuality in *Chlamydomonas chlamydogama*. Am. J. Botany 45: 621-626.

WEST, G. S. and C. B. STARKEY. 1915. A contribution to the cytology and life-history of *Zygnema ericetorum* (Kütz.) Hansg., with some remarks on the "genus" *Zygogonium*. New Phytologist 14: 194-205.

MARINE RESEARCH

SANDY HOOK LABORATORY: Fellowships in marine planktonological research to be conducted at the Sandy Hook Marine Laboratory, are being offered by Columbia's Lamont Geological Observatory. The fellowships, open to qualified scientists of any nationality, will be limited, in general, to $1500 plus transportation. A research vessel is available at Sandy Hook for field collecting. For further information consult the Director, P.O. Box 428, Highlands, New Jersey.

SCOTTISH MARINE BIOLOGICAL ASSOCIATION: Two research fellowships in marine biology, financed by the US Office of Naval Research, are available through the Scottish Marine Biological Association. Applicants should have a master's degree or its equivalent, in biological sciences. Fellows will be trained in analysis of plankton collections obtained from the Continuous Plankton Recorder survey of the northeastern Atlantic Ocean and the North Sea. The survey is to be expanded to include new routes across the Atlantic and North American waters. Salaries will range from £800 to £1000 per annum. For information consult the Officer-in-charge, Oceanographic Laboratory, Craighall Road, Edinburgh 6, Scotland.

VIRGINIA FISHERIES LABORATORY: The National Science Foundation is sponsoring two research participation programs beginning 11 June. One supplies research experience for undergraduate biology majors who are potential Master's Degree candidates. The other provides research experience for junior college and college science teachers with limited research facilities. Teachers participating must have at least the equivalent of a Master's Degree in the field in which they plan to do research. The Laboratory is affiliated with the College of William and Mary, located 13 miles away in Williamsburg. For information write: Robert S. Bailey, Director NSF Program, Virginia Fisheries Laboratory, Gloucester Point.

INTERNATIONAL INDIAN OCEAN EXPEDITION: The Special Committee on Oceanographic Research (SCOR) of the International Council of Scientific Unions is sponsoring the Expedition within the period 1961-1964. Anyone interested in participating in the United States Program (including those outside the US) should immediately contact Dr. John H. Ryther, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts.

1962 SUMMER COURSES

This listing of summer instruction includes primarily those courses dealing with the algae. Also noted are courses in Limnology, Oceanography, Cryptogamic Botany, or Invertebrate Zoology. Data supplied were furnished by the institution involved, generally the Director. The information is listed as follows:

STATE—Name of Biological Station: Summer address

Course, credit (s = semester, q = quarter): Instructor, home school: Days per week: Dates of session.

Where to apply: Deadline, if any: Additional information.

Primarily Marine

CALIFORNIA — Hopkins Marine Station: Pacific Grove

No report received.

—Mendocino Biological Field Station: Box 86, Albion

Marine Biology (undergraduate), 5q: D. V. Hemphill, Pacific Union College: 5. *Marine Ecology* (graduate), 4q: D. V. Hemphill: 5: 18 June-9 August.

Director, Biology Dept., Pacific Union College, Angwin: 4 June: Affiliated with Graduate School, Loma Linda University (Calif.).

—Pacific Marine Station: Dillon Beach, Marin County

Undecided: Director, Pacific Marine Station, Dillon Beach.

—Kerckhoff Marine Laboratory: 101 Dahlia Av., Corona del Mar

Marine Invertebrates, Marine Ecology, 8s: W. North, Scripps Institution of Oceanography: 6: Dates not confirmed, possibly 11 June-14 July.

Director, Dept. of Zoology, Seaver Laboratory, Pomona College, Claremont: 1 May.

FLORIDA—Oceanographic Institute, Tallahassee

Survey of Marine Science, 4s: R. W. Menzel, Florida State University: 5: 16 June-11 August.

Director, Florida State University, Tallahassee: 14 May: Limited enrollment.

—University of Miami Marine Laboratory: Coral Gables

Introduction to Oceanography, 4s?: R. H. Williams, University of Miami: 6: 18 June-24 July, 26 July-29 August.

Director of Summer Sessions, University of Miami, Coral Gables.

HAWAII—Hawaii Marine Laboratory: University of Hawaii, Honolulu 14

Neither Phycology nor Oceanography courses offered 1962.

MISSISSIPPI — Gulf Coast Research Laboratory: Ocean Springs

Introduction to Marine Botany, 4s: R. B. Channell, Vanderbilt University: 5. *Marine Zoology for Teachers*, 4s: H. J. Bennett, Louisiana State University: 5: 11 June-6 July.

Director, Ocean Springs: 25 May.

NORTH CAROLINA—Duke Marine Laboratory, Beaufort

Marine Algae, 6s: H. J. Humm, Duke University: 5½: *Marine Ecology*, 6s. I. E. Gray, Duke University: 5½: 12 June-17 July. *Marine Invertebrate Zoology*, 6s: C. G. Bookhout, J. L. Richardson, Duke University: 5½: 18 July-22 August.

Director, Beaufort.

OREGON—Oregon Institute of Marine Biology: Charleston

Neither Phycology nor Oceanography courses offered 1962.

PUERTO RICO—Institute of Marine Biology, Mayaguez

Neither Phycology nor Oceanography courses offered during summer, 1962. Both offered during academic year.

RHODE ISLAND—Narragansett Marine Laboratory, Kingston

No summer courses offered.

TEXAS—Institute of Marine Science: Port Aransas

Marine Botany: Not offered summer 1962.

VIRGINIA — Virginia Fisheries Laboratory: Gloucester Point

Marine Botany, 4s: H. J. Humm, Duke University: 2½. *Marine Biology*, 4s: Staff, School of Marine Science, Colleges of William & Mary, Virginia Institute of Marine Science: 2½: Dates of 8-week session not stated.

Director, School of Marine Science, Gloucester Point: 1 June.

WASHINGTON—Walla Walla College Biological Station: Rosario Beach, Rt. 3, Box 555, Anacortes

Marine Botany, 4q: B. Emery, Walla Walla College. 3: *Oceanography*, 4q: H. Coffin, Walla Walla College: 3: 11 June-13 July, 16 July-17 August.

Director, Biology Dept., Walla Walla College, College Place: 7 May.

—Friday Harbor Laboratories: Friday Harbor

Marine Algology, 6q: M. Neushul, University of Washington; H.B.S. Womersley, University of Adelaide, 5½: 18 June-21 July. *Marine Mycology*, 6q: T. W. Johnson, Jr., Duke University: 5½. *Advanced Phytoplankton Ecology*, 6q: E. Steeman Nielsen, Royal Danish School of Pharmacy, Copenhagen: 5½: 23 July-25 August.

Director, 201 Johnson Hall, University of Washington, Seattle 5: 1 March.

Fresh-water and Marine

MASSACHUSETTS—Marine Biological Laboratory: Woods Hole

Marine Botany; 0 (home school may give 5-6s, 7-8q): R. C. Starr, in charge, Indiana University; W. R. Herndon, University of Tennessee: B. Fott, Charles University, Prague; R. Ross, British Museum, London; W. R. Taylor, consultant, University of Michigan; L. Provasoli, special lecturer, Haskins Laboratories, New York; 5½: 17 June-28 July. Director, Marine Biological Laboratory, Woods Hole: 15 March: NSF funds available for partial support, request application at time of course application.

Primarily Fresh-water

IOWA—Iowa Lakeside Laboratory: Milford

Morphology of Algae, 5s or 7-8q: J. D. Dodd, Iowa State University: 5: 11 June-13 July. *Aquatic Ecology,* 5s or 7-8q: R. Bovbjerg, State University of Iowa: 5: ?16 July-17 August.

Director, Dept. of Zoology, State University of Iowa, Iowa City: 15 April.

MICHIGAN—Kellogg Gull Lake Biological Station: Rt. 1 Hickory Corners

Fresh Water Algae, 3 term: W. E. Wade, Michigan State University: 2. *Limnology,* 3 term: E. P. Speare, Olivet College: 2: 16 June-8 August.

Director, Rt. 1, Hickory Corners: 15 May.

—University of Michigan Biological Station: Pellston

Freshwater Algae, 2s: F. K. Sparrow, University of Michigan: 1. *Limnology,* 4s: G. W. Saunders, University of Michigan: 2: 23 June-18 August.

Director, University of Michigan, Ann Arbor: 15 April.

MINNESOTA—Lake Itasca Biology Session: Lake Itasca P.O.

Fresh-water Algae, 6q: R. F. Norris, University of Minnesota: 2. *Limnology,* 6q: J. Underhill, University of Minnesota: 2: 11 June-28 July.

Director, 300 Coffey Hall, University of Minnesota, St. Paul 1: 1 June: NSF funds available, inquire upon application.

MONTANA—Montana State University Biological Station: Bigfork

Fresh Water Algae: Not offered 1962. *Limnology,* 6q: Instructor, undecided: 2: 18 June-11 August.

Director, Montana State University, Missoula: 1 May.

OHIO—Franz Theodore Stone Laboratory: Put-in-Bay

Algae, 4q: C. E. Taft, Ohio State University: 3: ?23 July-25 August. *Limnology,* 4q: N. W. Britt, Ohio State University: 3: 18 June-20 July.

Director, Dept. of Zoology & Entomology, Ohio State University, Columbus 10: 10 June.

OKLAHOMA—University of Oklahoma Biological Station: Willis

Taxonomy & Ecology of the Freshwater Algae, 4s?: W. C. Vinyard, Humboldt State College: 2. *Limnology,* 3s?: Instructor undecided: 2: 2 June-28 July.

Director, University of Oklahoma, Norman: 20 May.

VIRGINIA—Mountain Lake Biological Station: Rt. 1, Pembroke

Neither Algae nor Limnology courses offered 1962.

NSF INSTITUTES

It is probably too late to be considered for any Institute this year as applications were due 15 February. However, if interested, write the Institution involved, not NSF. The listing is published in a brochure, available in late December.

DUKE UNIVERSITY at Duke Marine Laboratory, Beaufort, North Carolina. *Marine Sciences;* for college biology teachers. Write F. J. Vernberg, Duke Marine Laboratory, Beaufort, N.C.

UNIVERSITY OF OREGON at Oregon Institute of Marine Biology, Charleston. *Biology of Marine Organisms;* for college biology, botany, or zoology teachers. Write R. W. Castenholz, Biology Department, University of Oregon, Eugene.

BOWDOIN COLLEGE at Brunswick, Maine. *Basic Biology Especially as Shown by Marine Organisms;* for high school biology teachers. Write A. H. Gustafson, Biology Department, Bowdoin.

MICHIGAN STATE UNIVERSITY at Kellogg Gull Lake Biological Station, Hickory Corners, Michigan. *Biology;* for high school biology teachers. Write Dr. T. W. Porter, Science and Mathematics Teaching Center, Michigan State University, East Lansing.

UNIVERSITY OF MINNESOTA at Lake Itasca Forestry and Biological Station. *Basic Instruction in the Field and Laboratory with Experience in Biological Research;* for high school biology teachers. Write Dr. W. H. Marshall, 135 Johnson Hall, University of Minnesota, Minneapolis 14.

MONTANA STATE UNIVERSITY at Missoula, Montana. *Plant Anatomy; Ecology; Morphology of the Thallophytes; Algae; Ornithology; Recent Advances in Biology; Genetics; Vertebrate Physiology; Medical Microbiology;* for high school biology teachers. Write Dr. J. W. Gebhart, NSF Summer Institute in Biology, Montana State University, Missoula.

CURRENT RESEARCH REPORTS

Information is primarily from the Bio-Sciences Information Exchange of the Smithsonian Institution, Washington 25, D.C. No report will be published without the specific permission of the Principal Investigator (the first-named person). Inquiries concerning any of the reports should be made directly to those involved. Workers not ordinarily supplying an abstract to the Bio-Sciences Information Exchange are invited to send such research reports directly to the Editor.

LIMNOLOGICAL STUDY OF ANAEROBIC-AEROBIC SEWAGE PONDS

G. H. Dunstan, R. H. Green, R. A. Phillips, E. Hindin
Sanitary Engineering Section
Washington State University, Pullman

This study seeks to determine quantitative information as to the operation of sewage stabilization ponds when a first pond is operated anaerobically and is followed by one or more aerobic ponds. An effort is being made to determine the maximum B.O.D. loading which may be applied to the anaerobic cell, as well as the conditions necessary to prevent the development of odors from such a pond. It is also hoped to determine maximum loading data for the aerobic ponds. The effect of outdoor temperature on efficiency will be determined, since icing conditions have already occurred on the aerobic cells, and may also occur on the anaerobic ponds.

Particular attention is being given to algae and other plankton, and the conditions under which they exist. An effort will be made to determine more precisely the role which such organisms play in the purification process.

AEROBIC RESPIRATION OF *CHLAMYDOMONAS* DIFFERENTIATION

Max H. Hommersand
Botany Department, University of North Carolina, Chapel Hill

A preliminary study has indicated the presence of a different terminal oxidase in the zygospores than in the vegetative cells. The respiration of the zygospores is sensitive to carbon monoxide and at the same time is unaffected by low oxygen tensions down to ½%. In contrast, the terminal oxidase of the vegetative cells is insensitive to carbon monoxide and has a low affinity for oxygen. An examination will be made of the electron transport system of the zygospores and vegetative cells in order to account for the differences in the aerobic respiration of these two cell types.

This research is intended to contribute to the general problem of cellular differentiation by relating the character and behavior of the electron transport system of aerobic respiration to other metabolic and biosynthetic processes involved in morphogenesis.

NUCLEIC ACIDS AND THEIR METABOLISM IN *CHLORELLA*

T. Iwamura, E. Hase, T. Kanazawa
Tokugawa Institute for Biological Research, Tokyo

The aim of this research is primarily to explore the metabolism and functions of the nucleic acids of a green alga, *Chlorella*. Specifically, to investigate the behavior of the RNA and DNA distributed among subcellular components of the algal cells in relation to the process of growth by use of synchronous and other culture techniques. During the past months, our studies have been directed toward the following: 1) Quantitative estimation of the nucleic acid species and changes in their contents accompanied by metabolic changes of the algal cells, e.g., those observed during the algal life-cycle in synchronous culture; 2) Mechanism and significance of light-dependent nucleotide turnover of the chloroplastic DNA; 3) Nucleotide metabolism as one of the approaches to nucleic acid metabolism. Studies on enzymes related with nucleic acid metabolism will be started in the near future.

MARINE ALGAE OF THE NORTH AMERICAN COAST BETWEEN CAPE MAY, N. J. AND CAPE HATTERAS, N. C.

Jacques S. Zaneveld
Biology Department, The Norfolk College of William and Mary, Norfolk, Virginia

Generally speaking, for a number of algal species with subarctic tendencies the area between Cape Cod and Cape Hatteras is their southern limit, whereas the same area is the northern limit for most sub-tropical and tropical species. Therefore, a study of the marine algal flora of this area might add substantially to our knowledge of the distribution of the boreal and tropical species.

The plan of work involved the establishment of several field stations, from where it was possible to make surveys of certain parts of the coast. At these localities as many field notes of the marine vegetation were made as possible, as well as observations regarding the environmental factors.

Preliminary distinction between genera was made at the temporary field stations. The final analysis of the occurrence, abundance, and distribution of the various algae is based on representative specimens collected. After completion of the determinations, it is the intention to make additional collections of specimens where the hitherto collected material proves to be inadequate to learn the variability of a species.

PHYSIOLOGY AND BIOCHEMISTRY OF ALGAE

Jack Myers
Zoology Department, University of Texas, Austin

Research is proceeding currently on two kinds of problems: 1) the characteristics and role of accessory pigments in the Emerson enhancement effect in photosynthesis; and 2) characteristics of nitrogen fixation in relation to photosynthesis in blue-green algae.

The first is being pursued principally with the Haxo polarographic oxygen electrode which has been modified to give greater stability. The arrangement allows measurement of relative rate of oxygen production in either or both of two light beams presented from monochromators. In conjunction with this, we also are studying growth rates of algae in monochromatic light. Our attention has been centered upon *Chlorella,* but will proceed to *Anacystis nidulans* and *Porphyridium cruentum.*

RESPONSE OF ALGAE TO THE GIBBERELLINS AND OTHER PLANT HORMONES

Paul D. Saltman and Herbert Conrad
Biochemistry Department, School of Medicine
University of Southern California, Los Angeles

We have been able to demonstrate (Nature, 184: 556, 1959) that both indoleacetic acid and gibberellic acid have profound effects on the rate of growth of the alga, *Ulothrix.* We propose to assay a wide variety of growth promoting substances, including derivatives and antagonists of indoleacetic acid, 2, 4-dichlorophenoxyacetic acid, and others to learn of the intimate mechanism by which these hormones manifest their activity. We feel that the use of the algae, in contrast with the highly differentiated higher plants, may permit us to study the fundamental site of hormone activity. There also seems to be a light requirement for cell division. This requirement is not of the order of magnitude required for photosynthesis but seems to be directly concerned with a photo effect on growth and reproduction. Auxin and gibberellic acid play a role in this process as well. We also plan to investigate the biochemical pathways for respiration to see if any differences exist between the hormone and non-hormone treated cells.

RESEARCH ON THE EFFECT OF HALOGENATED BENZOIC ACIDS ON ALGAE

Howard G. Applegate
Botany Department, Southern Illinois University, Carbondale

Certain halogenated benzoic acids exhibit growth-regulating properties while other similar compounds are inactive in growth regulation. Most of the screening of such compounds has been done with vascular plants. Little information is available on halogenated benzoic acids as affecting growth of algae. In this study, *o*-, *m*-, *p*-, and triodo-, bromo-, and chloro-substituted benzoic acids will be applied to *Chara* and *Nitella*. Protoplasmic streaming in these algae will then be observed. It is hoped that a realtionship will be discovered between a normal streaming and type and position of chemical substitution. Such information will be of value in our long-term program.

COMPARATIVE BIOCHEMISTRY OF UREA BIOSYNTHESIS

Philip P. Cohen and George W. Brown, Jr.
School of Medicine, University of Wisconsin, Madison

Studies are being carried out on the phylogenetic distribution of ornithine-urea cycle enzymes. Attempts are being made to correlate the occurrence and levels of the enzymes with the over-all economy it serves the various organisms. The general program is designed to provide information of the various enzymic alterations in intermediary nitrogen metabolism associated with development of the organism in the broadest sense.

Organisms now under study (or contemplated) include: amphibians, reptiles, sharks, lungfish, lamprey eels, *Balanoglossus*, and blue-green algae. Blue-green algae are of interest in connection with the possible relationship of the fixation of molecular nitrogen and that of carbon dioxide in the synthesis of carbamyl phosphate.

The studies in progress include also the development of techniques for quantitation of enzyme levels in various tissues and localization of enzymes in different structural elements of the cell.

EFFECT OF U.V. LIGHT ON ALGAE PHOTOSYNTHESIS AND GROWTH

Guy Collingwood McLeod
Sias Research Laboratories, 227 Summit Ave., Brookline, Massachusetts

It is assumed that the quantum yield of photosynthesis drops rapidly at, or only a little beyond, the violet end of the visible spectrum (about 400 mμ). The absorption bands of chlorophyll, however, extend into the ultraviolet portion of the spectrum as far as the absorption has been investigated (to 220 mμ). Moreover, other components of the cells also absorb strongly in the ultraviolet—particularly below 300 mμ. This absorption is injurious to the organism as a whole, and may deter the capacity for photosynthesis. It is not known whether ultraviolet light absorbed by chlorophyll (and the carotenoids) also has this destructive effect, or whether it can be utilized for photosynthesis in the same way as blue or violet light. This question may be answered by 1) a qualitative and quantitative determination of the role of various pigments in sensitization, and 2) by an analysis of the relation between wave length and photochemical efficiency for each pigment.

INORGANIC-ORGANIC INTERACTIONS IN NATURAL WATERS

Joseph Shapiro

Sanitary Engineering Department, The Johns Hopkins University, Baltimore 18, Maryland

It is proposed to extract and purify the yellow coloring substances of natural waters and to study them from the following aspects: 1) physical nature —e.g., molecular weight; 2) chemical nature—e.g., content of specific functional groups; 3) relationship to cations of natural waters—e.g., are they capable of forming chelates or complexes with these ions, and if so, under what conditions, to what extent, etc.; 4) significance for the growth of algae—e.g., they are known to stimulate algal growth—how do they do this? Most of the time is to be spent on the last two aspects. Special emphasis will be placed on the third item.

ANALYSES OF HEREDITARY ENDOSYMBIOSIS IN *PARAMECIUM BURSARIA*

Richard W. Siegel,

Zoology Department
University of California, Los Angeles

Each individual *Paramecium bursaria* isolated from nature carries in its cytoplasm several hundred unicellular algae (*Chlorella*) in an hereditary endosymbiotic association. The present system appears ideal for the solution to some persistent problems of symbiosis and cellular heredity. To this end, a thorough description of hereditary endosymbiosis in *P. bursaria* is planned. Techniques for isolating and culturing independently both asymbiotic paramecia and exsymbiotic algae are at hand; endosymbiosis can be experimentally restored; new complexes involving algae and paramecia representing diverse strains can be achieved.

ISOLATION AND IDENTIFICATION OF ALGAE FROM SOIL

F. R. Trainor and R. L. Hilton, Jr.

Botany Department, University of Connecticut, Storrs

In researches with soil algae in the past, attempts to isolate all algal species from a number of soils have fallen short of completion. In order to understand eventually the role of algae in the soil, it is necessary that one know and isolate all or at least most algae present. Thus, one can study the properties of each form under laboratory conditions, as well as investigate possible interactions of various algal forms. The present project has as its main purpose a two-fold goal: 1) the isolation and identification of *all* species present in *one* soil, and 2) the determination and comparison of methods used to evoke growth of these organisms. The second part of the project would involve a study of the effect of incubation temperature, nutrition and intensity of illumination on the growth of algae from soil. By its very nature it will present us with considerable data concerning the cultural characteristics of each alga isolated.

FACTORS CONTROLLING THE GROWTH OF MARINE LITTORAL DIATOMS

Richard W. Castenholz and Warren E. Wilson
Biology Department, University of Oregon, Eugene

The primary purposes of this investigation are as follows:
1) the measurement of seasonal changes in diatom production rate and species composition on the southern Oregon coast in a unique natural habitat in which light intensity and duration are possibly the only significant variables. Permanently submerged racks with glass plates are used as substrates on which attachment rate and production are measured. Both organic weight and chlorophyll determinations are used to measure total production, while the diatom ash is used to determine species composition.
2) the determination of light intensities and temperatures for optimal growth of the dominant species using unialgal cultures. Preliminary evidence indicates that light intensity changes in nature may regulate the changes in species composition and total production.
3) the establishment of what environmental factors related to intertidal exposure limit the growth and species composition of attached diatoms in the littoral zone.
4) the evaluation of the effect of grazing (gastropods) on the size of the littoral diatom populations.
5) the study of various aspects of the physiologies of the main species, including salinity tolerances and optima, requirements for organic growth factors, day length response, etc.

PRODUCTIVITY OF THE SEA-ROLE OF MICROORGANISMS

William D. McElroy
McCollum-Pratt Institute, Johns Hopkins University, Baltimore, Maryland

The following research problems will receive our immediate attention:

A. Photosynthetic organisms (dinoflagellates, etc.): 1) Nutritional requirements for heterotrophic and photosynthetic growth; 2) Pigment composition; 3) Spectral energy requirements; 4) CO_2 fixation pattern; 5) Ecological distribution—various algal forms; 6) Control of plankton blooms.

B. Fungi: 1) Nutrition—particularly ionic environment; 2) Enrichment and distribution of various types; 3) General metabolic studies.

C. Bacteria: 1) Types and distribution; 2) Nutrition—particular reference to salt environment; 3) Mutability by ultraviolet light; 4) Permeability problems; 5) Viability in salt water without carbon or nitrogen source; 6) Occurrence of various luminous species.

D. Bacteriophage: 1) Isolation and characterization; 2) Effect of salt on viability; 3) Nature of host; 4) Mutability.

CHICAGO NATURAL HISTORY MUSEUM

Modest grants to assist individuals wishing to study at the Chicago Natural History Museum are available for work in any of the following fields: anthropology (with a natural-history orientation), botany and geology (including paleontology), and zoology. An applicant should briefly describe the proposed study, state the length of study at the museum, the amount of money needed, and name one reference. For information consult the Chairman, Karl P. Schmidt Fund, c/o Chicago Natural History Museum, Roosevelt Road and Lake Shore Drive, Chicago 5, Illinois.

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA

The Jessup Fellowships are for students of systematics who wish to study with one of the scientific staff or use the Academy's collections. The fellowships, usually for a 2 - 3 month period, provide about $50 a week which is sufficient to cover living expenses plus minimum travel expenses. For information consult the Director, Academy of Natural Sciences, 19th and The Parkway, Philadelphia 3, Pennsylvania.

AWARDS AND PRIZES

JOHN AND SAMUEL BARD AWARD IN MEDICINE AND SCIENCE: given annually by Bard College to a scientist who has made particularly distinguished contributions to science, either basic or applied. The first award was made in June, 1961, to Dr. Detlev W. Bronk, President of the Rockefeller Institute, President of the National Academy of Science, and Chairman of the National Science Board. Nominations for the 1962 award should be sent to the Alumni Office, Bard College, Annandale-on-Hudson, New York.

DARBAKER PRIZE IN PHYCOLOGY: given annually by the Botanical Society of America for meritorious work in the study of the algae. The committee will base its judgment primarily on papers published in 1960 and 1961, although not exclusively. The award is limited to residents of North America and papers in English. Nominations should be sent to the Chairman, Paul C. Silva, Department of Botany, University of California, Berkeley, by 1 June 1962. Included should be a statement of the merits of the candidate and reprints.

The 1961 winner was Paul B. Green of the University of Pennsylvania. His research has been on the nature of cell wall growth and development in such algae as *Nitella* and *Bryopsis*. He has combined information secured from use of such techniques as the light microscope, electron microscope, polarization and interference optics, and labelled compounds.

BRITISH PHYCOLOGICAL SOCIETY

The 10th Annual General Meeting was held 3-4 January at the Imperial College of Science and Technology, London. A session on the electron microscope and fine structure of the algae was held the first day. A colour and sound film, "Electron Microscopy," was shown by the Associated Electrical Industries, Ltd. Demonstrations and contributed papers composed the remainder of the 2-day program. Abstracts of the papers will be published in Volume 2, No. 3 of the British Phycological Bulletin, issued in the autumn of 1962.

The British Phycological Bulletin, which is published annually, also contains several short specialized articles, the Presidential Address (in 1961, 2(2), Dr. Mary Parke's title was "Some remarks concerning the class Chrysophyceae"), short notes, book reviews, and activities of the Society. Information concerning the Bulletin may be secured from the Hon. Editor, Dr. E. Conway, Botany Department, University of Glasgow, Scotland. At present membership in the Society is £1.

The new officers elected at the recent meeting are the same as for 1961. They are: President, Professor G. E. Fogg; Vice-Presidents, Dr. R. W. Butcher, Mr. R. Ross; Hon. Secretary, Mr. H. T. Powell; and Hon. Treasurer, Dr. M. T. Martin.

RESEARCH REQUEST

Mr. Karl Mattox, a graduate student in the Department of Botany, University of Texas is anxious to obtain collections of living material containing unbranched ulotrichlean algae. Collections should be sent by air mail in small containers to Mr. Mattox. Senders will be reimbursed for postage.

Herman S. Forest, Biological Laboratories, University of Rochester, Rochester 20, New York, would like to obtain samples of *Nostoc* and *Anabaena*. These need not be unialgal and postage will be paid.

Dr. M. Diaz-Piferrer, Institute of Marine Biology of the University of Puerto Rico, Mayaguez, is interested in receiving reprints, books, and bulletins concerning the algae of tropical regions. He was formerly associated with Universidad de Oriente and Instituto Cubano de Investigaciones Tecnológicas (ICIT) in Cuba and left his library when he moved to Puerto Rico.

PHYTOPLANKTON CULTURES: At the request of the Sub-committee on Botany of the Pacific Science Congress, Dr. Mary Belle Allen is preparing a list of the cultures of marine phytoplankters that are currently being maintained. It will be appreciated if investigators having such cultures will send their lists to her at, Kaiser Foundation Research Institute, S. 14th and Cutting Blvd., Richmond, California, U.S.A.

MEETINGS

AAAS

The 128th General Meeting of the American Association for the Advancement of Science was held during the Christmas holidays in Denver, Colorado. The Phycological Society's representative on the Council is your Editor. Over 1500 papers were presented, as well as several talks of a general nature. The few papers of a phycological nature were presented at the Society of Protozoologists.

The Council voted on a variety of items. This included advising the Board of Directors regarding a pending House of Representatives Bill (HR 8556) that will change the method of selecting NSF fellowship recipients. The Council voted that use of anything other than merit for NSF grants was unwise. Referred to committee were proposals concerning nuclear testing and civil defense shelter proposals. More complete information regarding Council's action will be published in the magazine, *Science*. One of the highlights of the Council meeting was the presentation of the 1961 account which shows net receipts of $176,176!

INTERNATIONAL BOTANICAL CONGRESS

At the 1961 Purdue meeting, the Society (and Phycological Section of the Botanical Society) recommended that a letter be written to the Executive Committee of the Xth Botanical Congress (Edinburgh, 1964) supporting a Phycological Section. The reply from Congress President H. Godwin quoted a letter from G. E. Fogg (President of the British Phycological Society and Secretary of the Programme Committee of the Congress) to M. de Virville (Société Phycologique de France) explaining the reasoning.

Following recommendations agreed to at the IXth Congress in Montreal, emphasis is to be placed on symposia, rather than sectional meetings. Phycology is to be represented in the General Systematics Sectional Committee, Fine Structure and Cyto-chemistry, Experimental Ecology, Excursion Committee, and the Programme Committee. In other words, the Congress is arranged around the growing points of Botany, rather than arbitrary division into sections.

LIMNOLOGY CONGRESS

The 15th International Congress of Limnology will be held 20-25 August at the University of Wisconsin, Madison. The President is Dr. A. D. Hasler of the University of Wisconsin. The Congress will include Plenary Sessions on the World's Great Lakes; The Recovery of Nutrients from Organic Effluents; Decomposition-Processes, Results and Limnological Significance; as well as several sessions of contributed papers and two sessions of review papers. Three excursions are planned before the Congress, and 8 excursions afterwards. The final date for receipt of paper titles was 1 December 1961.

Many of the limnologists attending will be available for lectures before and after the Congress. This will include several members of the Phycological Society of America. Honoraria received by the foreign limnologists will be of considerable financial help. Names of those available may be secured from the Congress office. Requests for information regarding the Congress should be directed to Dr. John C. Wright, Executive-Secretary, Birge Hall, University of Wisconsin, Madison 6.

3RD SEMINAR ON BIOLOGICAL PROBLEMS IN WATER POLLUTION: to be held 13-16 August at the Sheraton-Gibson Hotel, Cincinnati, Ohio, with the theme, 'Water Quality Criteria for Aquatic Life.' This seminar is sponsored by the Research Branch, Division of Water Supply and Pollution Control, Robert A. Taft Sanitary Engineering Center, Cincinnati, and is scheduled just prior to the 15th International Limnology Congress in Madison, Wisconsin. One symposium on Phytoplankton is planned with G. E. Fogg of London as chairman and speaker. Further information: C. H. Tarzwell at the Center, 4676 Columbia Pkwy., Cincinnati 26.

NEWS AND NOTES

Approximately 6000 scientists were registered at the AAAS meetings in Denver, including the following phycologists: RICHARD CASTENHOLZ (University of Oregon), OSMUND HOLM-HANSEN (University of Wisconsin), SEYMOUR HUTNER (Haskins Laboratory, New York), STANLEY SCHER (University of California, Berkeley), BEATRICE SWEENEY (Yale University), and DAN L. WILLSON (Central Washington State College, Ellensberg).

M. ANN ALLEN is presently a Research Associate at the Hartley Botanical Laboratories of The University, in Liverpool, England. Dr. Allen was previously associated with the Belvedere School in Liverpool.

EVA CLAUS-SUBA and GEORGE CLAUS of Pretoria, South Africa, are on the staff of the Medical Center of New York University. She was at the University of Pretoria and he with the Council of Scientific and Industrial Research.

YALE DAWSON, who is mayor of Santa Ynez, California, has started 1962 by a collecting expedition in Ecuador, Peru and the Galapagos. He is finishing an illustrated key to the genera of benthic algae of Pacific Central America (in Spanish) to encourage resident workers in that area. His plans for the summer include collecting in Costa Rica and working with the NSF Institute at the University of Costa Rica.

MICHEL G. DENIZOT of the Museum National d'Histoire, Laboratoire de Cryptogamie, visited the University of British Columbia on his return to Paris after a 6 month collecting trip to New Caledonia.

SEYMOUR HUTNER, Haskins Laboratories in New York, was elected President of the Society of Protozoologists at the recent meeting in Denver. This then brings the Phycologists and Protozoologists into close contact, as President LUIGI PROVASOLI is also at the Haskins Laboratories.

DERRY D. KOOB of Wellesley College was pictured in the recent Wellesley College Bulletin showing him in his new faculty apartment. He and EDGAR WEBBER comprise the Phycological half of the Botany Department.

CHARLES P. MASON, recently at Cornell University, has become a member of the staff of the Biology Department of Hamline University, in St. Paul, Minnesota.

LANDY MCBRIDE recently received his PhD from the University of Wisconsin and is now affiliated with the Division of Biological Sciences at the Argonne National Laboratory, Argonne, Illinois.

JOHN D. A. MILLER, previously at University College, London, is presently with the National Chemical Laboratory in Teddington, England.

RONALD J. PHILLIPS is a member of the Biology Department of Seattle Pacific College. He and other members of the department visited the University of British Columbia during a Symposium on the Cell which featured A. FREY-WYSSLING of Zurich, Switzerland and JAMES BONNER of Cal Tech.

HARRY K. PHINNEY has agreed to serve as the local representative of the Phycological Society at the AIBS meetings at Oregon State University, Corvallis, this August. He will also be the local representative of the American Microscopical Society.

In honour of the 80th birthday of E. G. PRINGSHEIM (see vol. 14(3/4) of the News Bulletin) a Symposium on the 'Morphology and Physiology of the Algae' was held in Göttingen. Some 37 scientists from Europe and the United States were included as speakers. Members of the Society present included PROFESSOR PRINGSHEIM, JACK MYERS, P. BOURRELLY, P. KORNMANN, and J. C. SOEDER.

PROFESSOR and MRS. PRINGSHEIM are presently enjoying sunshine and colourful flowers at Bajamar in the Canary Islands. They are at the same place where last year he had the accident that broke his leg. As a consequence he is not quite as mobile as he would like, although they are seeing much of the island.

SHIRLEY R. SPARLING, University of California at Santa Barbara, will be one of the Instructors at the NSF Institute of Marine Science for college teachers at Coos Bay, Oregon.

BEATRICE SWEENEY, formerly with Scripps Institution of Oceanography, is affiliated with the Botany Department of Yale University. She now lives in Westport, Connecticut, and is now Mrs. Paul Lee, although she still answers to the name of Beazy Sweeney.

Seminar speakers at Indiana University, Bloomington, have included E. STEEMAN NIELSEN of Copenhagen, and RUTH SAGER of the Rockefeller Institute.

The Nominating Committee of the Phycological Society of America consists of RICHARD C. STARR (Indiana University), Chairman; HAROLD C. BOLD (University of Texas), and G. F. PAPENFUSS (University of California, Berkeley).

SUMMER TOUR ON SCIENCE RESEARCH

An 8-week course on science research in contemporary Europe, sponsored by the State University of New York and the Experiment in International Living, will be held during the summer of 1962. Participants will visit research institutions, oceanographic stations, zoological and botanical gardens, and museums. For information consult Walter Lener, State University of New York, Geneseo.

PLATE I.

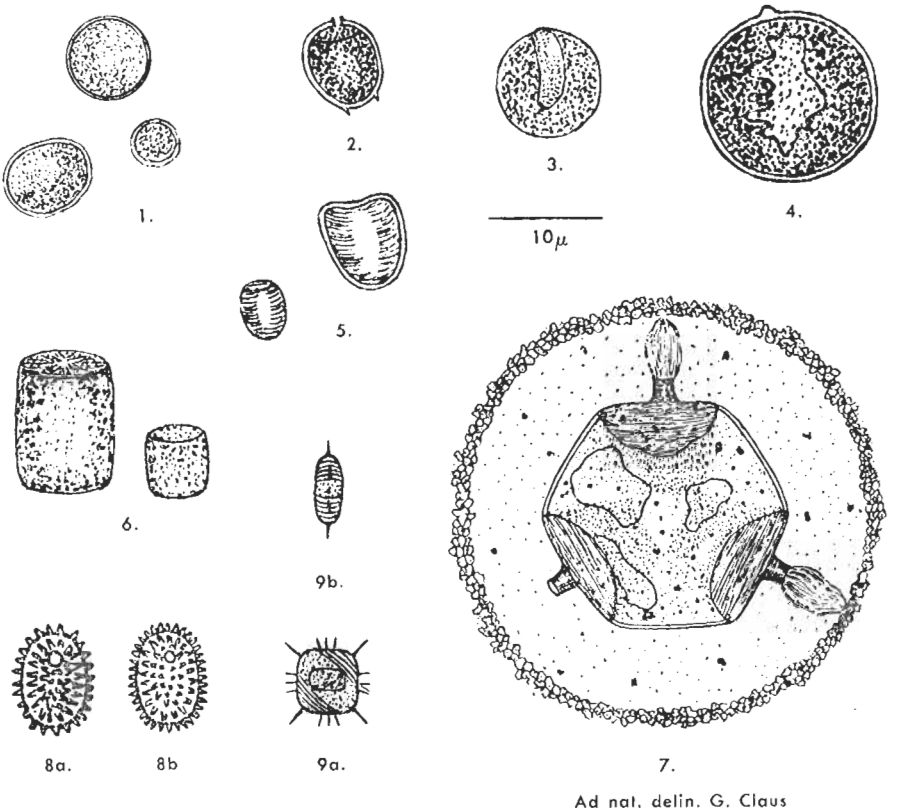

Fig. 1, *Apollinarisphaera meteoricola* nov. gen., nov. spec. Fig. 2, *Stemmatopila uniporata* nov. gen., nov. spec. Fig. 3, *Discacerra sulcata* nov. gen., nov. spec. Fig. 4, *Apophoreta aethrodescensa* nov. gen., nov. spec. Fig. 5, *Ancilicula vetusta* nov. gen. nov. spec. Fig. 6, *Dactyliotheca daedala* nov. gen., nov. spec. Fig. 7, *Daidaphore berzelii* nov. gen., nov. spec. Fig. 8, *Siderolappa lapillata* nov. gen., nov. spec.: 8a, showing coarse spines; 8b, showing fine spines. Fig. 9, *Oscenoscaeva proævita* nov. gen., nov. spec.: 9a, surface view; 9b, side view.

TAXONOMICAL CONSIDERATION OF CERTAIN INCERTA SEDES

George Claus and Bartholomew Nagy

New York University Medical Center, New York 16, New York and
Department of Chemistry, Fordham University, New York 58, New York.

In a recent proposal to Taxon (Claus and Nagy, 1962) we suggested that certain amendments be incorporated in the International Code for Botanical Nomenclature (Lanjouw, 1961). We felt that this was necessary because there is no provision in the existing Code for naming extraterrestrial taxa. There seem to be two possibilities for naming such taxa:

1) To apply the Code in its present form, in accordance with Principle 1[1];

[1] Principle 1, second paragraph reads: "The Code applies equally to names of taxonomic groups treated as plants, whether or not these groups were originally assigned to the plant kingdom."

2) To amend the Code in accordance with the special consideration arising from the finding of extraterrestrial forms. We proposed (Claus and Nagy, 1962) that Principle 1 and Articles 3, 13, 36 and 42 be amended.

Some investigators of extraterrestrial forms seem to be inclined to follow the first alternative. Such procedure, although it appears to be logical, raises some difficulties, among which the most obvious one is the ruling of Article 42 dealing with the naming of new fossil taxa. According to this Article: "The name of a monotypic genus of fossil plants published on or after 1 January 1953 must be accompanied by a description of the genus indicating its difference from other genera." The application of this Article to extraterrestrial genera would require the author to provide a complete differential diagnosis of the new genus or genera against already established genera of earthly fossils. Furthermore, it would make it possible to classify some of the extraterrestrial taxa in already existing form genera. In our opinion this may be somewhat of a geocentric approach. Consequently, in the following classification we did not apply the ruling of Article 42 in its existing form but followed our proposal (Claus and Nagy, 1962). This proposal is subject to acceptance by the forthcoming Botanical Congress but we are of the opinion that differential diagnoses of new genera of extraterrestrial species should be sufficient inter se.

In the following we describe 9 new genera which are at the present time monotypic. **Apollinarisphaera meteoricola** nov. gen., nov. spec. = Organized Element Type 1. pro parte. (Claus and Nagy, Nature, 192:594, 1961.)

Corpora parva, sphaerica, seu leniter ovata, diametribus 4-12μ, solitaria, vel colonias multicellulatas formantes: muri duplicati, sine spiculis visibilibus foraminibus sculpturisque: color luteo-viridis, seu fulvus.

Locis in Orgueil, Ivuna, Alais et Tonk facibus coelestibus habitant.

Small spherical or slightly ellipsoidal bodies with diameters of 4-12μ, solitarily or forming small, many-celled colonies: wall doubled, without spines, pores or sculpturing: color yellowish-green or deep orange.

Holotype: *Apollinarisphaera meteoricola* nov. spec. Slide 1. (Orgueil). Illustrations: Fig. 1: Nature, 192:595, fig. 1 (in fluorescent light); 596, fig. 6 after Feulgen staining. Type locality: Orgueil meteorite. Etymology: *Apollinaris* = which is sacred to Apollo: *sphaera* = a globe: *meteoricola* = which dwells in a meteorite.

Remark: This is the most abundantly found remains occurring in all 4 of Wiik's (1956) Group 1 Carbonaceous Chondrites.

Stemmatopila uniporata nov. gen., nov. spec. = Organized Element Type 2. pro parte. (Claus and Nagy: Nature, 192:594, 1961.)

Corpora leniter ovata, solitaria: latitudo, 13-15μ; longitudo, 16-18μ: muri duplicati, crassi, sine sculpturis visibilibus, ad apicem foramine una, ad basem una vel duobus spiculis: color luteo-viridis.

Locis in Orgueil et Ivuna facibus coelestibus habitant.

Genus novum a specie proximo generis una foramine apicale et una vel duobus spiculis basalibus differt.

Slightly ellipsoidal bodies: width, 13-15μ; length, 16-18μ: wall doubled, thick, without visible sculpturing, with a single pore at the apex and with 1 or 2 small spines at the base: color yellowish-green.

The species of this genus differs from the previous one with the presence of a single pore and with the 1 or 2 basal spines.

Holotype: *Stemmatopila uniporata* nov. spec. Slide 2. (Orgueil). Illustrations: Fig. 2: Nature, 192:595, fig. 2 (in transmitted light); ibid. fig. 3 (phase-contrast picture). Type locality: Orgueil meteorite.

Etymology: *stemma* = high antiquity: *pila* = a ball: *uniporatus* = which has one pore.

Remark: Although this form is quite abundant, it was found only in the Orgueil and Ivuna meteorites.

Discacerra sulcata nov. gen., nov. spec. = Organized Element Type 2. pro parte (Claus and Nagy: Nature, 192:594, 1961.)

Corpora aliquatenus placata, sphaerica, solitaria, diametribus 12-18μ: muri duplicati, tenues, sine sculpturis visibilibus, parva ad apicem papilla locata et sulco sub papilla posito: color luteo-viridis.
Locis in Orgueil, Ivuna, Alais et Tonk facibus coelestibus habitant.
A specibus generum proximis parvo ad apicem papilla locata et sulco prominente sub papilla curvato posito genus novum differt.

Somewhat flattened, spherical, solitary bodies with diameter of 12-18μ: wall doubled, thin, without sculpturing; with a small papilla at the apex and with a curved subpapillary furrow. color yellowish-green.

The species of this genus differs from the previous ones with the presence of a small apical papilla and with the pronounced subpapillary furrow.

Holotype: *Discacerra sulcata* nov. spec. Slide 3. (Orgueil). Illustrations: fig. 3. Type locality: Orgueil meteorite.

Etymology: *discus* = a quoit. *acerra* = a casket for incense. *sulcatus* = furrowed. Remark: This form is quite abundant in all 4 of Wiik's (1956) Group 1 Carbonaceous Chondrites; however, it occurs most commonly in the Orgueil and Alais meteorites.

Apophoreta aethrodescensa nov. gen., nov. spec. = Organized Element Type 2. pro parte. (Claus and Nagy: Nature, 192: 594, 1961.)

Corpora sphaerica, solitaria, diametribus 16-22μ: muri duplicati, crassi et lamellati, sine sculpturis visibilibus, parva ad apicem papilla locata et in media parte rima inaequaliter adumbrata: color luteo-viridis.
Locis in Orgueil et Ivuna facibus coelestibus habitant.
A specibus generum proximis in media parte rima inaequaliter adumbrata genus novum differt.

Spherical, solitary bodies with diameters of 16-22μ: wall doubled, thick, lamellated without visible sculpturing; with a small papilla at the apex and with an irregularly outlined crack in the center: color yellowish-green.

The species of this genus differs from the previous ones with the presence of an irregularly outlined crack in the center.

Holotype: *Apophoreta aethrodescensa* nov. spec. Slide 4. (Orgueil). Illustrations: fig. 4. Type locality: Orgueil meteorite.

Etymology: *apophoreta* = a present given to guests: *aethra* = the upper air: *descensus* = which descends.

Remark: This form was found only in the Orgueil and Ivuna meteorites. Its occurrence is not too common.

Ancilicula vetusta nov. gen., nov. spec. = Organized Element Type 3. (Claus and Nagy: Nature, 192:595, 1961.)

Corpora scutiformata, placata, solitaria: latitudo, 10-16μ; longitudo, 14-18μ: murri duplicati, crassi, striati, striae plus minusve paralellae, aream depressam, lanceolatam in media parte locatam praetermissae: color luteo-viridis.
Locis in Orgueil, Ivuna, Alais et Tonk facibus coelestibus habitant.
A specibus generum proximis forma et muro striato genus novum differt.

Shield-shaped, flattened, solitary bodies: Width, 10-16μ: length, 14-18μ: walls doubled, thick, striated; striae $\pm$ parallel leaving free a depressed, long-oval area in the center: color yellowish-green.

The species of this genus differs from the previous ones with its shield-shaped form and with its striated walls.

Holotype: *Ancilicula vetusta* nov. spec., Slide 5. (Orgueil). Illustrations: fig. 5. Type locality: Orgueil meteorite.

Etymology: *ancile* = the sacred shield which fell from heaven: *vetustus* = antique. Remark: Although this form occurs in all 4 of Wiik's (1956) Group 1 Carbonaceous Chondrites, it is more common in the Alais and Tonk than in the Orgueil and Ivuna meteorites.

Dactyliotheca daedala nov. gen., nov. spec. = Organized Element Type 4. (Claus and Nagy: Nature, 192:595, 1961.)

Corpora cylindrica, solitaria: latitudo, 8-14μ; longitudo, 10-20μ: muri duplicati, crassi, striati striae in media parte superficierum rotundarum radiantes: color luteo-viridis.

Locis in Orgueil, Ivuna, Alais et Tonk facibus coelestibus habitant.

A specibus generum proximis, forma cylindrica et superficiebus rotundis striatis genus novum differt.

Cylindrical, solitary bodies: width, 8-14μ, length, 10-20μ: walls doubled, thick, striated; striae radiate in the center of the circular surfaces: color yellowish-green. The species of this genus differs from the previous ones with its cylindrical form and with its striated circular surfaces.

Holotype: *Dactyliotheca daedala* nov. spec. Slide 6. (Orgueil). Illustrations: fig. 6. Type locality: Orgueil meteorite.

Etymology: *dactyliotheca* = a casket for gems: *daedalus* = artfully constructed. Remark: Although this form occurs in all 4 of Wiik's (1956) Group 1 Carbonaceous Chondrites, it is more common in the Orgueil and Alais than in the Ivuna and Tonk meteorites.

Daidaphore berzelii nov. gen., nov. spec. = Organized Element Type 5. (Claus and Nagy: Nature, 192:595, 1961.)

Corpora polyedrica, in sectione transversa hexagonales, solitaria, diametribus 8-16μ; quattuordecim superficiebus; areis pellucidis circumdatis (diametribus totalibus 25-30μ); tribus protrusionibus tubulatis (= collis, longitudinibus 0.8-1.8μ latitudinibus 0.6-1.2μ), bases earum percrassis et striis parallelis, muri duplicati, crassi, praeter bases collorum, sine sculpturis visibilibus: materia filamentosa (ad 50 filamenta) e collis protrudit: pars interior subtiliter granulata, tribus simili vacuolo structuris: color luteo-viridis, seu fulvus.

Locis in Orgueil et Tonk facibus coelestibus habitant.

A specibus generum proximis tribus protrusionibus tubulatis et corpore polyedrico differt.

Fourteen surfaced, polyhedral, in cross-section hexagonal, solitary bodies (diameter: 8-16μ), surrounded with a transparent halo (total diameter: 25-30μ); with 3 tubular protrusions (= collars having a length of 0.8-1.8μ and a width of 0.6-1.2μ) the bases of which are markedly thickened and parallelly striated: walls doubled, thick, except at the bases of the collars, without visible sculpturing: filamentous material (up to 50 filaments) protrudes from the collars: inside finely granulated, with 3 vacuole-like structures: color yellowish-green or orange.

The species of this genus differs from the previous ones with the presence of the 3 tubular protrusions and with its polyhedral body.

Holotype: *Daidaphore berzelii* nov. spec. Slide 7. (Orgueil). Illustrations: fig. 7: Nature, 192:595, fig. 4. Type locality: Orgueil meteorite.

Etymology: *dais* = a pine torch: *phoros* = carrier: *Berzelius* = German chemist who in 1834 performed the first organic chemical analysis of a carbonaceous (Alais) meteorite.

Remark: This form seems to be extremely rare. Two and some broken individuals were found in the Orgueil and 4, somewhat smaller specimens in the Tonk meteorites.

Siderolappa lapillata nov. gen., nov. spec.

Corpora ovata, solitaria: latitudo, 10-12μ; longitudo, 14-16μ: muri duplicati, crassi, perspicati una foramina subapicali locata: color ochraceus.

Locis in Ivuna face coelesti habitant.

A specibus generum proximus mure perspicato et una foramine subapicali locata genus novum differt.

Ellipsoidal, solitary bodies: width, 10-12μ; length, 14-16μ: wall doubled, thick with many spines and with a single subapical pore: color ocherous.

The species of this genus differs from the previous ones with the presence of the many spines covering its entire surface and with the single subapical pore.

Holotype: *Siderolappa lapillata* nov. spec. Slide 12. (Ivuna). Illustrations: fig. 8a, 8b. Type locality: Ivuna meteorite.

Etymology: *sidereus* = belonging to the stars: *lappa* = a bur: *lapillus* = a precious stone.

Remark: This form seems to be rather rare. It was found only in the Ivuna meteorite.

Oscenoscaeva proavita nov. gen., nov. spec.

Corpora a superficie quadrata, a latere fusiformes, diametribus 4-6μ, crassitudinibus 2-3μ: muri duplicati, duobus angulorum alii alios jacentium stritais, ceteris levatis: apices quisque spica una ornati et latera singula spiculis tribus decorata: in media parte corporis quadrangulus parvus: color fulvus.

Locis in Orgueil et Ivuna facibus coelestibus habitant.

A specibus generum proximis forma quadrata, apicibus spicis ornatis et lateribus decoratis spiculis genus novum differt.

In surface view quadrate, in side view fusiform bodies with diameters of 4-6μ and with thickness of 2-3μ: wall doubled with 2 of the corners lying against each other, being striated and the other 2 being smooth: each apex with 1 spine and each side with 3 spicules: in the center of the body a small square: color deep orange.

The species of this genus differs from the previous ones with its quadrangular shape, with the apices bearing a spine and with the sides having 3 spicules.

Holotype: *Oscenoscaeva proavita* nov. spec. Slide 8. (Orgueil). Illustrations: fig. 9a, 9b. Type locality: Orgueil meteorite.

Etymology: *oscen* = a signe (bird) from whose note auguries were taken: *scaeva* = a portent: *proavitus* = ancestral.

Remark: This form seems to be rather rare. It was found only in the Orgueil, where it is more common, and in the Ivuna meteorites.

The types of the new species (genera) will be located in the Riksmuseet in Stockholm.

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