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## THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

### PRELIMINARY ANNOUNCEMENT OF THE CLEVELAND MEETING

Edited by F. R. MOULTON

PERMANENT SECRETARY

AFTER a lapse of two years during which the American Association for the Advancement of Science has held no meetings, it will meet for the fifth time in Cleveland, Ohio, from September 11 to September 16, inclusive. The previous meetings in Cleveland were held in 1853, 1888, 1913 and 1931. In 1852 a meeting scheduled for Cleveland was canceled because of an epidemic of yellow fever along the Ohio River and farther south. There have been fears that this meeting would have to be canceled because of the war.

This preliminary announcement has been delayed because of constant changes in the programs due to the uncertainties that have prevailed during the past few months. The choice has been between an early announcement that would be erroneous to an appreciable extent and an announcement so late that it would not be of maximum value. In spite of all difficulties the program will consist of many notable sessions, though in number of scientific societies meeting with the association and in the number of papers presented will fall far below several meetings immediately preceding the war. But it may be confidently expected that after the close of the war scientists will resume their normal work and their meetings with increased enthusiasm.

### HOTELS AND HEADQUARTERS

General headquarters of the meeting will be at the Hotel Statler. The headquarters of sections and affiliated societies are distributed among hotels as follows:

*Statler*: Sections on Physics, Zoological Sciences, Anthropology, Psychology, Social and Economic Sciences, History and Philosophy of Science, Medical Sciences, and Education; American Society of Zoologists, American Society of Parasitologists, American Microscopical Society, American Society of Naturalists, Ecological Society of America, Union of American Biological Societies, National Association of Biology Teachers, American Psychological Association, American Association of Applied Psychology; American Statistical Association, Econometric Society, Society of the Sigma Xi, Sigma Pi Sigma, Sigma Delta Epsilon, National Association of Science Writers, American Society of Aesthetics.

*Carter*: Sections on Mathematics, Astronomy, and Agriculture; American Society for Horticultural Science.

*Cleveland*: Sections on Chemistry, Geology and Geography, and Engineering; Research Council on Problems of Alcohol.

*Hollenden*: Section on Botanical Sciences; Botanical Society of America, American Society of Plant Physiologists, Mycological Society of America, Sullivant Moss Society.

All reservations for rooms should be made through the Cleveland Convention Bureau, 1604 Terminal Tower Building, Cleveland.

#### REGISTRATION

Registration will be on the mezzanine floor of the Hotel Statler, beginning each morning at eight o'clock. All persons attending the meeting are expected to register (registration fee, \$1.00). Each registrant will receive a copy of the General Program of the meeting.

#### OFFICIAL MEETINGS

The *Executive Committee of the Council* will meet at 4:00 P.M. on Sunday, September 10, in the Permanent Secretary's room in the Hotel Statler.

The *Council* of the Association will meet at 2 P.M. on Monday afternoon, September 11, in Parlor L, Hotel Statler. Later sessions will be held in the same room at 9 A.M. on days to be determined at the first meeting.

The *Academy Conference* will be held in Parlor L, Hotel Statler, on Monday, September 11, at 3:30 P.M., or immediately following the meeting of the Council. This conference will be followed by the Academy dinner at 6:30 P.M. in the Hotel Statler.

#### GENERAL SESSIONS

On Monday evening, September 11, at 8:15 P.M., Dr. Isaiah Bowman, president of The Johns Hopkins University, will deliver an address as retiring president of the association in the Music Hall of the Cleveland Public Auditorium. The title of Dr. Bowman's address is "Commanding our Wealth."

On Tuesday evening, September 12, Dr. Edwin J.

Cohn, of Harvard University, will deliver the twenty-first Annual Lecture under the joint auspices of the American Association for the Advancement of Science and the Society of the Sigma Xi, in the Music Hall of the Cleveland Public Auditorium. Dr. Harlow Shapley, president of the Sigma Xi, will preside. The subject of Dr. Cohn's address is "Blood and Blood Derivatives," a subject to which he has made notable contributions during the war period.

On Wednesday evening, September 13, Dr. Shapley will deliver the eighth Annual Lecture under the joint auspices of the American Association for the Advancement of Science and the United Chapters of Phi Beta Kappa, in the Music Hall of the Cleveland Public Auditorium. The subject of Dr. Shapley's address is "A Design for Fighting." Dr. Raymond Walters will preside at this session.

On Thursday evening, September 14, Dr. Matthew W. Stirling (and Mrs. Stirling), chief of the Bureau of American Ethnology and leader of six archeological expeditions into the wilds of southern Mexico, will deliver an illustrated lecture in the Music Hall of the Cleveland Public Auditorium. The title of the lecture by Dr. and Mrs. Stirling is "National Geographic Society-Smithsonian Institution Archeological Expeditions to Southern Mexico." Dr. Anton J. Carlson, president of the association, will preside at this session.

#### GENERAL SYMPOSIA

At conferences of secretaries of sections of the association and of associated societies, held in Chicago and New York on February 20 and 27, 1944, respectively, it was recommended that adequate time at the Cleveland meeting be devoted to general sessions on the larger problems of science, such as science and the post-war world, with particular emphasis upon rehabilitation, education, and research.

To carry out that recommendation, at least in part, the following symposia have been organized. Tuesday afternoon, September 12, 2:00 P.M. in the Lattice Room, Hotel Statler.

#### RESEARCH AFTER THE WAR: THE NEED FOR A NATIONAL POLICY ON RESEARCH

Informal discussion by members of the Committee on Science and Society, Lawrence K. Frank, *Chairman*, and invited speakers.

Wednesday morning, 10:00 A.M., in the Pine Room, Hotel Statler, under the chairmanship of Howard R. Tolley, chief of Bureau of Agricultural Economics, U. S. Department of Agriculture, a symposium will be held on "The Role of Science in United Nations Collaboration for the Improvement of Nutrition and Agriculture after the War." The participants are Dr. Frank G. Boudreau, director of the Milbank Me-

morial Fund; Professor Robert Rae, University of Reading, Reading, England; Mr. P. Lamartine Yates, British Minister of Agriculture.

Wednesday afternoon, 2:00 p.m., in the Ball Room, Hotel Hollenden, under the chairmanship of Dr. G. M. Smith, a symposium will be held on "Biologists and Rehabilitation." The participants will include E. G. Butler, Princeton University; Frans Verdoorn, Arnold Arboretum; Robert F. Griggs, George Washington University, and W. F. Loehwing, University of Iowa.

#### SPECIAL SYMPOSIA

American Psychological Association, American Association for Applied Psychology, Psychometric Society and the Section on Psychology will hold a joint symposium on Monday morning on "Graduate and Professional Training of Psychologists."

On Monday afternoon, September 11, a general conference on "Publication Problems in Biology" will be held under the chairmanship of John E. Flynn, editor-in-chief of *Biological Abstracts*. The participants in this important conference will be Dr. Flynn; Robert F. Griggs, Division of Biology and Agriculture, National Research Council; Zeliaette Troy, Boyce Thompson Institute; R. E. Buchanan, Iowa State College; Herman H. Henkle, Library of Congress; Fernandus Payne, Indiana University; and Paul Weiss, The University of Chicago.

Also on Monday morning and afternoon the Subsection on Dentistry will hold sessions of a symposium on "Fluorine and Dental Caries."

On Tuesday morning, September 12, five symposia sessions will be held: (1) "Quartz—Geology and Mineralogy," by the Section on Geology and Geography and the Section on Physics; (2) "Parasitology in Relation to the War," by the American Society of Parasitologists, American Society of Zoologists, and the Section on Medical Sciences; (3) "Psychology and Post-War Problems," by the American Psychological Association, the American Association for Applied Psychology, the Psychometric Society and the Section on Psychology; (4) "History and Philosophy of Science in Post-War Education," by the Section on History and Philosophy of Science; (5) "Alcoholism," by the Research Council on Problems of Alcohol.

On Tuesday afternoon four symposia sessions will be held: (1) "Quartz—Physics," by the Section on Geology and Geography and the Section on Physics; (2) "Aims and Needs in the Philosophy of Science," by the Section on History and Philosophy of Science; (3) "Alcoholism," by the Research Council on Problems of Alcohol; "Genes as Physiological Agents," by the American Society of Zoologists.

On Wednesday morning, September 13, two sym-

posia sessions will be held: (1) "Teaching Ecology," by the Ecological Society of America and the Section on Education; (2) "Alcoholism," by the Research Council on Problems of Alcohol.

On Wednesday afternoon five symposia sessions will be held: (1) "Biologists and Rehabilitation," by the Botanical Society of America; (2) "Medical Mycology," by the Mycological Society of America; (3) "Tropical American Bryophytes and Lichens," by the Sullivant Moss Society; (4) "Science and the New World," by the Section on History and Philosophy of Science; (5) "Alcoholism," by the Research Council on Problems of Alcohol and the Committee on Alcoholics of the Welfare Federation of Cleveland.

On Thursday morning, September 14, a joint symposium on "Nutrition" will be held by the Section on Botanical Sciences, the Botanical Society of America, the American Society of Plant Physiologists, the American Society for Horticultural Science, and the Section on Agriculture.

On Thursday afternoon three symposia sessions will be held: (1) "Catalysis," by the Section on Chemistry; (2) "Biology and Human Progress," by the American Society of Naturalists and the American Society of Zoologists; (3) "Premedical Education," by the Section on Medical Sciences and Alpha Epsilon Delta, National Honorary Premedical Fraternity.

On Friday morning, September 15, a symposium will be held on "The Joint Responsibilities of Science and the American Press in the Post-War Period," by the National Association of Science Writers.

Section and Society Programs are scheduled to be held as follows:

*Section on Mathematics* will meet Tuesday afternoon, September 12, when Dr. F. D. Murnaghan will deliver his retiring vice-presidential address on "The Teaching of Mathematics," and Dr. R. S. Burington will present a paper on "New Frontiers."

*Section on Physics* and the Ohio Section of The American Physical Society will hold four sessions on Monday and Tuesday at which 23 papers will be presented. At the close of the final session a sound and color motion picture film on "Crystals Go to War" will be exhibited. This film will illustrate the processes used in the production of quartz crystal units that are playing a major role in the war.

*Section on Chemistry* on Thursday afternoon, September 14, will present a symposium on "Catalysis," one of the papers being an address by Dr. Hugh S. Taylor, retiring vice-president of the association.

*Section on Astronomy*, on Thursday, September 14, will hold two sessions, the morning session consisting of general papers and the afternoon to a symposium on "Objective Prism Spectra."

*Section on Geology and Geography* will hold six sessions, September 12 to 14, inclusive, before which 50 papers will be presented, and field excursions.

The first session is Part I of the symposium on "Quartz," entitled "Geology and Mineralogy"; the second is Part II of the symposium, entitled, "Physics"; the third is on "Geography and Economic Geology"; the fourth is on "Stratigraphic and General Geology"; the fifth is on "Quaternary Geology of the Great Lakes Region"; and the sixth is on "Physiographic Geology and Meteorology." The field excursions on Friday will begin with a visit to an iron ore unloading dock, followed by visits to points of geological interest.

*Section on Zoological Sciences* will hold only a business meeting on Wednesday, the address of the retiring vice-president of the section, Dr. George T. Hargitt, being scheduled for delivery at the annual dinner of the American Society of Zoologists on Wednesday evening. The title of Dr. Hargitt's address is "What is Germ Plasm?"

*American Society of Zoologists*, on September 12 to 14, inclusive, will hold 11 sessions before which 58 papers and 12 demonstrations will be presented in person by their authors. In addition, 55 papers will be presented by title, a total of 125 papers. Of the papers to be read by the authors, 10 are in the field of "Cytology and Embryology," 10 on "Endocrinology," 9 on "Endocrinology and General Physiology," 13 on "General Physiology," 8 on "Morphology and Protozoology" and 8 on "Parasitology, General Evolution, and Ecology." The 57 to be read by title have a similar distribution. The society will hold its annual dinner on Wednesday evening, September 13.

*American Society of Naturalists* will hold its annual dinner on Thursday evening, September 14, at which Dr. Fay-Cooper Cole will deliver his presidential address on "Human Racial Development and Migration."

*Section on the Botanical Sciences*, on Tuesday afternoon, September 12, will hold a joint session with the Botanical Society of America, the American Phytopathological Society, the American Society of Plant Physiologists, and the Sullivant Moss Society, at which the program will consist of addresses of two past vice-presidents for the section and the current retiring vice-president.

Dr. G. M. Smith, Stanford University, vice-president for the section in 1942, will deliver his retiring address on "The Marine Algae of the Monterey Peninsula, California"; Dr. W. J. Robbins, New York Botanical Garden, vice-president for the section in 1943, will deliver his retiring address on "The Importance of Plants"; and Dr. R. E. Cleland, Indiana University, will deliver his retiring vice-presidential address on "Phylogenetic Relationships of Oenothera."

*Botanical Society of America*, September 12 to 14, inclusive, will present the programs of its 39th meeting in general sessions of the society and under four sections, the General Section, the Paleobotanical Section, the Physiological Section and the Systematic Section.

The General Section will hold three sessions, on Tuesday, Wednesday and Thursday mornings, at which 34 papers will be presented.

The Paleobotanical Section will hold a session on Tuesday morning at which 6 papers will be presented.

The Physiological Section will hold 5 sessions, two on Tuesday morning, one a joint meeting with the American Society of Plant Physiologists, at which 11 papers will be presented, and one jointly with the American Society of Plant Physiologists, at which 11 papers will be presented. On Thursday afternoon the section will hold a joint session with the American Society of Plant Physiologists, at which 8 papers will be presented.

The Systematic Section on Tuesday morning will hold a joint session with the American Society of Plant Taxonomists, at which 8 papers will be presented.

In addition to general sessions of the Botanical Society of America and its sections, and joint sessions with other societies, at which 93 papers will be presented, the society will participate in the symposium on "Nutrition" and the symposium on "Biology and Human Progress," mentioned above under "Special Symposia." It also joins in the Biologists' Smoker on Tuesday evening and sponsors the Botanists' dinner on Wednesday evening.

*American Society of Plant Physiologists* on September 12 to 14, inclusive, will hold 6 sessions and joint sessions at which a total of 50 papers will be presented.

On Tuesday morning two sections of the society will hold joint sessions with the American Society of Plant Physiologists and the Physiological Section of the Botanical Society of America. On Tuesday afternoon the society will hold a joint session with the American Society of Plant Physiologists. On Tuesday evening, the society will hold the Plant Physiologists' dinner, at which the Charles Reid Barnes Life Membership Award and the Stephen Hales Award will be announced. Following the dinner, Dr. W. E. Loomis, 1943 retiring president, will deliver an address on "Translocation in Maize."

On Wednesday morning and afternoon the society will hold joint sessions with the Physiological Section of the Botanical Society of America at which 21 papers will be presented. On Thursday morning the society will participate in the symposium on "Nutrition" and on Thursday afternoon will hold a joint session with the American Society of Plant Physiolo-

gists and the Physiological Section of the Botanical Society of America, at which 8 papers will be presented.

*Mycological Society of America* on Tuesday afternoon will hold a joint session with the American Society of Plant Physiologists and the Sullivant Moss Society. On Wednesday afternoon the society will hold its business session and a session at which Dr. G. W. Martin, president of the society, will deliver his presidential address on "The Classification of the Tremellales," which will be followed by 4 other papers. The society will also hold sessions on Thursday morning and afternoon at which 20 papers will be presented.

*Sullivant Moss Society* will hold a joint session on Tuesday afternoon with other societies, and sessions on Wednesday morning and afternoon at which 12 papers will be presented.

*American Society of Naturalists* will participate in the symposium on "Biology and Human Progress," on Thursday afternoon, and arrange for the Naturalists' Dinner on Thursday evening.

*Ecological Society of America* will meet on September 11 to 14, inclusive. It will hold its business session on Monday morning and a session Tuesday morning at which 3 papers will be presented. On Tuesday afternoon there will be 13 papers and reports on "The Study and Preservation of Nature." Following the dinner of the society on Tuesday evening, Dr. Orlando Park, past president of the society, will deliver an address on "Observations Concerning the Future of Ecology." On Wednesday morning a session will be held at which 4 papers will be presented. In the afternoon the society will divide into 3 sections, one for a conference on "Pollen Analysis and Related Bog Problems," another for an illustrated lecture on "The Native Forests of the Cleveland Region," and the third for a business meeting. On Thursday two sessions will be held, at which 11 papers will be presented, and a field trip to the beech-maple climax forest in North Chagrin Metropolitan Park.

*The American Microscopical Society* will hold a luncheon and scientific session on Tuesday, September 12.

*National Association of Biology Teachers* will hold its meeting on Saturday, September 16. In the morning and afternoon programs 7 papers will be presented. At its Saturday evening dinner, Dr. A. J. Carlson, the president of The American Association for the Advancement of Science, will deliver an address on "The Science of Biology and the Future of Man."

*Union of Biological Societies* will hold an important business meeting on Wednesday afternoon for the presentation of reports of committees and the con-

sideration of the Union as a possible centralizing organization for American biologists.

*Section on Anthropology* will hold sessions on Friday afternoon, September 15, and on Saturday morning, September 16, for the presentation of papers. On the Friday afternoon session, at which 5 papers will be presented, there will be a "General Discussion on Race Problems." In the evening the Anthropologists' dinner will be held. The Saturday morning program consists of 5 papers.

*Section on Psychology*, on Monday and Tuesday, will hold joint sessions with the American Psychological Association and the American Association for Applied Psychology. On Tuesday evening the section will hold a joint session with the Section on Education, at which 2 addresses will be delivered. Dr. Edward C. Tolman, vice-president for the Section on Psychology, will deliver his retiring address on "A Stimulus—Expectancy Need—Cathexis Psychology," and Dr. Harold Clark, vice-president for the Section on Education, will deliver his vice-presidential address on "How Far is Experimentation in the Social Sciences Possible?"

*American Psychological Association, American Association for Applied Psychology and Psychometric Society* will hold sessions on Monday and Tuesday for the presentation of scientific papers. On Monday morning, in addition to the symposium on "Graduate and Professional Training of Psychologists," an address of the president of the American Association for Applied Psychology, Dr. Albert T. Poffenberger, will be delivered on "Psychology: Academic and Professional." At the same session, an address of the president of the American Psychological Association, Dr. Gardner Murphy, will be delivered on "The Freedom of Intelligence."

On Monday afternoon the societies will hold a conference on "The Problems and Values of the Proposed Reorganization of Psychological Studies." On Tuesday the societies will hold a symposium on "Psychology and Post-War Problems."

*Section on Social and Economic Sciences* will hold a session on Tuesday morning on "Geography and Population" at which 4 papers will be presented, one of which is the address of the retiring vice-president for the section, Dr. Stanley D. Dodge, whose subject is "Population Periods in the History of the United States."

*American Statistical Association* will hold a session on Monday morning, September 11, on the "Statistics of Biological Assay," at which 3 papers will be presented. The afternoon session will be devoted to a round-table discussion on "The Function of the Statistical Unit in a College, University, or Research Laboratory." The Wednesday morning program will be

on "Statistical Methods in Current Economic-Psychological Problems," while the afternoon will be devoted largely to technical statistical questions. On Thursday the society will hold two joint round-table conferences on "Forecasting Post-war Demand." Among the speakers at this conference will be Stephen M. DuBrul, General Motors Corporation; S. Morris Livingston, U. S. Department of Commerce; Jacob L. Mosak, Office of Price Administration, and Arthur Smithies, Bureau of the Budget.

*Econometric Society* will hold two general sessions on Wednesday, and on Thursday morning and afternoon it will hold a joint round-table conference with the American Statistical Association on "The Forecasting of Post-war Demand." On Friday morning the society will hold a session on "Consumption," and in the afternoon a final session on "Investment," at which Lawrence R. Klein, Massachusetts Institute of Technology, and Benjamin Higgins, McGill University, Montreal, will present papers.

*Section on Engineering*, on Tuesday morning and afternoon, will hold a symposium on "Synthetic Rubber," consisting of six papers. On Wednesday morning and afternoon the section will hold a symposium on "Aviation Medicine" jointly with the Section on the Medical Sciences. The contributors include Brigadier General Eugene G. Reinartz, Randolph Field, San Antonio, Texas; D. W. Bronk, Coordinator of Research, Office of the Air Surgeon, Army Air Forces; Hugh De Haven, Crash Injury Research Project, National Research Council; A. Sidney Harris, Western Reserve University; Ross A. McFarland, Harvard University, and Franklin D. Burger, Medical Officer, Northeast Airlines.

*Section on Medical Sciences*, on Tuesday morning, will hold a symposium on "Parasitology in Relation to the War" jointly with the American Society of Parasitologists and the American Society of Zoologists. On Wednesday the section will hold a symposium on "Aviation Medicine" jointly with the Section on Engineering. On Thursday morning the section will hold a session at which 11 papers will be presented, and on Thursday afternoon it will hold a symposium on "Premedical Education." At the two sessions on Friday 30 papers on a wide variety of subjects will be presented.

*Subsection on Dentistry* on Monday morning and afternoon will hold a symposium on "Fluorine and Dental Caries," at which 11 papers will be presented. Contributors to this important subject include H. Trendley Dean, F. L. McClure and F. A. Arnold, Jr., National Institute of Health; T. Ockerse, Department of Public Health, Pretoria, South Africa; Robert Weaver, Board of Education, London, England; Philip Jay, University of Michigan Dental School; Wallace D. Armstrong, University of Minnesota;

Harold C. Hodge and R. F. Sognnaes, University of Rochester; Basil G. Bibby, Tufts Dental School, and Abel Wolman, the Johns Hopkins University.

*Alpha Epsilon Delta*, national honorary premedical fraternity, will hold a symposium on "Premedical Education," on Thursday afternoon, at which 5 papers will be presented.

*Section on Agriculture* on Thursday morning will hold a symposium on "Nutrition—Some Current Views" jointly with the Section on Botanical Sciences, the Botanical Society of America and the American Society of Plant Physiologists. The principal formal papers will be presented by R. E. Buchanan, Iowa State College; R. J. Garber, U. S. Regional Pasture Research Laboratory, State College, Pennsylvania, and A. E. Murneek, University of Missouri.

*American Society for Horticultural Science* will hold sessions on Tuesday, Wednesday and Thursday. On Tuesday morning the society will hold a joint session with American Society of Plant Physiologists on "Growth Substance." In the afternoon there will be two sessions, one on "Fruit Breeding" and one on "Vegetable Crops." The Wednesday morning program is in two sessions, one on "Pomology" and the other on "Vegetable Crops—Growth Substances." On Wednesday afternoon the society participates in the symposium on "International Collaboration in Science." The annual dinner will be held on Wednesday evening, at which the retiring president of the society, Dr. Warren P. Tufts, the University of California, will deliver an address. The programs on Thursday are on "Pomology," "Vegetable Crops" and "Tissue Analysis."

*Sigma Delta Epsilon*, Graduate Women's Scientific Fraternity, will hold its National Council meeting on Tuesday morning and a luncheon for all women in science on Wednesday noon.

*American Society for Aesthetics* will hold its first annual meeting on Monday, Tuesday, and on Wednesday morning. At the session on Monday morning 5 papers will be presented on "Aims and Methods in Aesthetics." The session on Monday afternoon will consist of a business session and papers on "General Theory." On Tuesday morning the general subjects will be "The Arts, Music, Literature," 5 papers, and 5 papers at the Tuesday afternoon session on "The Visual Arts." A dinner will be held on Tuesday evening. The Wednesday morning program will consist of 6 papers on "The Arts: Various Approaches."

*Research Council on Problems of Alcohol* will hold a symposium on alcoholism on Tuesday and Wednesday. The program on Tuesday morning consists of nine papers. The afternoon program consists of four general papers and a round-table session on "The Conditioned Reflex Treatment of Alcoholism." On Tuesday evening two concurrent round-table discus-

sions will be held, one on "Differential Diagnosis in Relation to Therapy" and the other on "Group Aids to Therapy (with Special Reference to Alcoholics Anonymous)." The Wednesday program will be de-

voted to "Alcoholism and War." Simultaneously the Committee on Alcoholics, Welfare Federation of Cleveland, will present a program of eight papers on various aspects of alcoholism.

## AGAR RESOURCES OF THE SOUTH ATLANTIC AND EAST GULF COASTS

By HAROLD J. HUMM

MARINE LABORATORY, DUKE UNIVERSITY

### NORTH CAROLINA RESOURCES

COMMERCIAL agar production on the Atlantic coast has become a reality during the past year with the processing by two firms of seaweed found in abundance along the North Carolina coast near Beaufort. Utilization of these newly discovered resources came as the result of a preliminary announcement made in SCIENCE<sup>1</sup> late in 1942 of work carried on in the Duke University Marine Laboratory. If the present abundance of raw material can be maintained, this new industry gives promise of continuing to thrive and expand after the war.

The most abundant red alga of the Beaufort region, *Gracilaria confervoides* (L.) Greville, is now being harvested, dried and sold by fishermen to processing factories. From 1,000 to 1,500 tons, wet weight, are estimated to have been gathered between August 1, 1943, and January 1, 1944. This is approximately 150,000 to 200,000 pounds of dry weed with an agar yield of 60,000 pounds or more, depending upon cleanliness of dry material, yield and thoroughness of extraction. Most of this seaweed was gathered from a single shallow bay of 500 to 600 acres in extent. Many other similar accumulations of *Gracilaria* were present from which no commercial collections were made.

In the Beaufort area, *Gracilaria confervoides* grows and accumulates in great loose masses in shallow water where salinity is almost that of the open sea. It is collected by simply forking it into small boats. Drying is accomplished by spreading it on racks covered with wire, slats or netting and built several feet above the ground. Dried material that has been carefully cleaned and bleached brings a higher price. Many fishermen are now selling fresh seaweed by the ton as one firm has recently omitted the drying step in processing.

Growth of this valuable seaweed occurs principally from May through November. Loose pieces, which may increase ten times in weight within two weeks, drift about, break apart and continue growth until areas protected from strong currents support masses of seaweed sometimes several feet thick. In late sum-

mer and fall, when commercial collecting is best, much of this accumulated material moves out of protected areas into deeper water where tidal currents distribute it throughout the sounds and winds wash it ashore. This drifting seaweed, formerly a net-fouling nuisance, is now collected commercially by shrimp trawlers. That which remains in protected areas continues to grow until about mid-November. Masses of it winter over and serve as "seed" material for the following summer's crop. In December, a slow deterioration begins, characterized by fragmentation of large plants, dying back and a slow decrease in agar yield. In some areas, an encrusting Bryozoan forms a layer of calcium carbonate over the stems. These loose plants apparently do not reproduce sexually, but scattered attached plants do so abundantly. The present abundance of *Gracilaria* may be coincident with the disappearance of eel grass, *Zostera marina* L. The latter probably occupied the habitats in which *Gracilaria* now accumulates and may have adversely affected for the alga such a factor as nitrate content of the sea water.

Agar made from *Gracilaria confervoides* of the Beaufort region, though not identical with that from *Gelidium*, the genus used for this purpose in California and Japan, is sufficiently similar to be referred to as agar. It seems to have somewhat greater gel strength and greater elasticity than *Gelidium* agar.

*Gracilaria* agar is more variable in temperature of gelation and usually somewhat higher than *Gelidium* agar. These variable results are not yet fully understood. Samples of *Gracilaria* agar produced by a factory located at Beaufort, N. C., have all gelled at about 38° C. Samples from another factory have exhibited a higher gelation temperature, some of these gelling at 55° C. or slightly higher. Raw material from which these agars were prepared came from the same general area at about the same time of year. The two methods of preparation were different. One process involved boiling, the other cooking under steam pressure; one product was purified by freezing, with the other this step was omitted. Variations in salt content and other impurities in agar have an influence

<sup>1</sup> H. J. Humm, SCIENCE, 96: 230-231, 1942.