# SCIENCE

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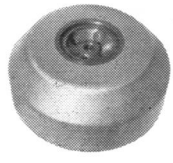

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# Letters

## Leukemia and Radiation

Brues article "Critique of the linear theory of carcinogenesis" [*Science* **128**, 693 (1958)] is an admirable and highly critical review which deals particularly with the relationship of human leukemogenesis to ionizing radiation. Many good points are made indicating that there may be a nonlinear relationship of radiation dose to leukemic end result. In the end, however, one is faced with the usual difficulty of trying to assess which of the different interpretations derived from the same sets of data is correct. Brues would be the first to admit, I am sure, that his interpretations, however well reasoned, may be as far from the mark as the next man's.

The statement is made (page 694) that "this steady increase [in incidence of leukemia in the United States] has been *loosely* attributed to an increase in human irradiation (*17*)" (italics mine). The reference is to an editorial of mine written in 1947 ["Is leukemia increasing?" *Blood* **2**, 101 (1947)] in which some comment is made upon an article by Sacks and Seeman appearing in the same issue. Various possibilities for the apparent increase in incidence of leukemia are discussed, including those of radiation and chemical exposure. Indeed, most emphasis is placed upon various forms of chemical exposure and their possible leukemogenic effects. There is no mention (in this editorial) of "an increase in human radiation" as Brues rather "loosely" states. However, the prophetic statement is made, shortly after the event and before any cases of leukemia were described, that "it will be of interest to observe the Japanese survivors of the atomic bomb for future indications of proliferative disease of the white cells."

Brues may have reference to another editorial published more recently [W. Dameshek and F. W. Gunz, *J. Am. Med. Assoc.* **163**, 838 (1957)] in which the suggestion was broached that the apparent increase in incidence of leukemia may be due, at least in some measure, to the increasing exposures of affluent populations to diagnostic and therapeutic x-radiation. Although some of the conclusions were admittedly speculative, it seemed fitting in this editorial to emphasize the potential dangers of radiation therapy for nonneoplastic disease and of unnecessary and frequently repeated diagnostic x-ray procedures.

In our recent book *Leukemia* [W. Dameshek and F. W. Gunz (Grune and Stratton, New York, 1958)] Gunz and I discuss the matter of leukemogenesis and ionizing radiation at length and conclude from all the available data that only about 15 percent of the cases of leukemia can reasonably be ascribed to radiation and that there are other etiologic agents such as chemical exposure and heredity which it is just as important to emphasize. It may well be that the various leukemogenic agents that have been discussed (ionizing radiation, carcinogenic chemicals, viruses, heredity) act by inducing a modification or "deletion" of certain cellular enzymes, thus leading to an altered type of growth pattern for a certain number of cells, depending upon (i) the dose and (ii) the tissue. The leucocytic tissues, already "generalized," will respond in a generalized—that is, leukemic—fashion. However, it is also possible that a very small clone of abnormal cells may develop which is insufficient to do much damage or may indeed be overwhelmed.

Brues article, which is a model for a critical review, is well worth reading and carefully digesting.

WILLIAM DAMESHEK
*Blood Research Laboratory,*
*New England Center Hospital,*
*Boston, Massachusetts*

My blunder in attributing this view to Dameshek is the sort of thing that is the nightmare of anyone who prepares an extensive bibliography. While others have loosely attributed to radiation many things which are changing or thought to be changing, he is not one of them. I apologize particularly because he has maintained and voiced a balanced and reasonable view of the whole problem.

AUSTIN M. BRUES
*Division of Biological and Medical Research, Argonne National Laboratory, Lemont, Illinois*

## Excessive Education Department Requirements

Recently I wrote a letter to *Science* [**128**, 1156 (1958)] mentioning, among other things, the excessive education department requirements for science teacher certification. It was implicit in the discussion that university science departments had produced thousands of fine science teachers who are barred from secondary-school teaching positions in most states because they would not spend a fifth to a quarter or more of their university time taking education department courses.

Subsequently, the 85th Congress passed Public Law 85-864, which by its own terms may be cited as the National Defense Education Act of 1958. Certain provisions of this act create concrete financial difficulties for student borrowers because of the excessive education department requirements.

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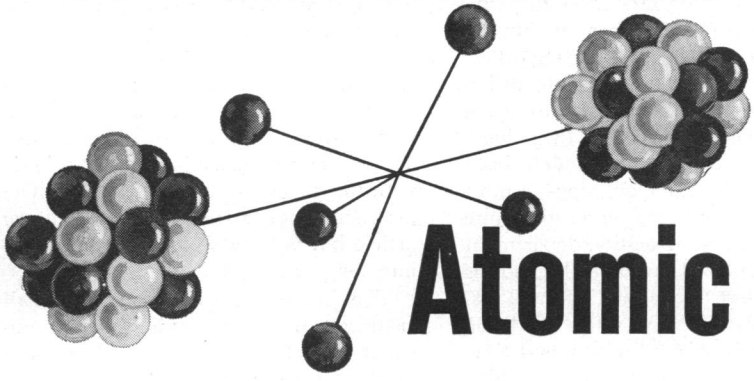

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Title II of the act provides for student loans of up to $5000, and in section 205 (b)(3) provides for cancellation of the obligation to repay up to 50 percent of the loan as a reward for specified time spent in teaching in public elementary or secondary schools. Thus, a student borrower who after graduation goes into teaching is entitled to what amounts to a bonus of up to $2500. Yet regardless of the fact that a science department believes the man well qualified to teach science, he must also satisfy the education course requirements, which have been lobbied into the regulations in most states. The student who won't give time to all the required education department courses is penalized up to $2500, and his services are lost to the public-school system. The student who must heed the $2500 bonus provision must spend time on education department courses which might be better spent on solid subject-matter courses. The Defense Education Act thus becomes in effect a force feeder for the already disproportionately large education departments.

It seems more important than ever that scientists and science departments rather than educationists should prescribe the qualifications for science teachers—that a science department teaching recommendation be admitted in lieu of an arbitrary number of education courses for teacher certification. The American Association for the Advancement of Science can properly advise state regulatory bodies that the quality of teaching will be improved, not lowered, by elimination of all education department courses not deemed necessary by the science department to fit each individual case.

WILLIAM W. PORTER II
*Los Angeles, California*

## Scientific Communication

A recent editorial [*Science* **127**, 1145 (1958)] and a letter by D. Lebo [*Science* **128**, 424 (1958)] have called attention to increasingly critical problems of scientific communication. Some attributes of an improved communication system are (i) capability of evolving from the existing system; (ii) reduction of delays in communicating results; (iii) coverage of a broad range of scientific interests (reversal of the trend toward overspecialized journals); (iv) guarantee of self-determination to the individual author (elimination of editor-referee censorial power and of pressure toward source-material abridgment); (v) guarantee of self-determination to the individual subscriber (elimination of unwanted material from his mail, unlimited availability of wanted material); (vi) incurrence of no added cost.

The following hypothetical system illustrates the possibility of reconciling these apparently divergent requirements. The contributor prepares a full account of his research, sparing no detail. He also prepares an abridgment of perhaps two pages and a conventional abstract. The full account receives an identification number and is permanently filed in a central repository. The abridgment is printed, with its number, in a bound journal resembling (except for its broader scope) the appropriate existing journal. Thus, the necessary evolutionary link with the present system is provided. The abstract is not, as now, adjoined to the article but is printed, with identification number, on a separate card.

The journal subscriber receives with each issue the corresponding stack of abstract cards (optionally he might wish to receive only the cards). These may advantageously be border-punched cards [G. Cohn, *J. Franklin Inst.* **266**, 133 (1958)], partially prepunched to provide rough classification assistance. Most of the border holes are left unpunched, to allow the subscriber to apply his own information-retrieval methods and adapt his punching system to his personal needs and mnemonic habits. (The required tools are simple: a punch and a sorting needle. To retrieve abstracts in a given category, form cards into a deck in any order, pass the needle through the appropriate hole, spread and lift the deck; the punched cards fall out.)

By postcard, included with the abstract cards, subscribers request photocopies (or other facsimile reproductions) of those full accounts that interest them. If the latter prove scientifically exceptionable, the volunteer "referees" have a professional obligation to communicate their suggestions to the authors. Profiting from such criticisms, authors may issue revisions to supersede their earlier accounts. The constructive aspects of the present refereeing system are thus retained and enhanced, since a maximum number of maximally interested referees are effectively consulted. The editor, too, plays a more constructive role. He can select for full publication articles worthy of general attention, or those for which the demand exceeds the resources of economical facsimile copying, but he suppresses nothing and delays nothing.

Subscribers might be entitled to annual allowances of facsimile material, extra requests being charged on a per-page basis. The reprint problem is solved automatically. Savings in type-setting costs resulting from the abridgment policy might offset the cost of abstract cards.

It is hoped that these suggestions may encourage scientists to experiment with evolutionary improvement of traditional publication procedures.

T. E. PHIPPS, JR.
*Falls Church, Virginia*

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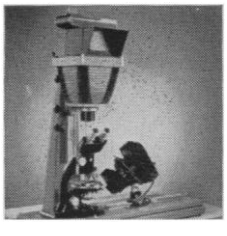

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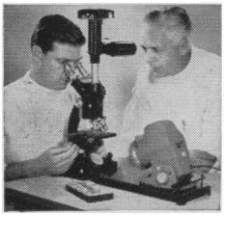

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# Meetings

## Darwin-Wallace Centennial

This year is the centenary of the reading of the joint paper "On the tendency of species to form varieties; and on the perpetuation of varieties and species by natural means of selection," by Charles Robert Darwin and Alfred Russel Wallace. It is appropriate, therefore, that biologists throughout the world should be celebrating the initial presentation of the theory of natural selection to the Linnean Society of London in 1858, for this first reading of the Darwin-Wallace paper was indeed an event of great significance in the history of science and in the more comprehensive history of mankind.

The coincidence of this centenary with the meetings of the 15th International Congress of Zoology in London was made the occasion for various ceremonies and events to honor the great revolution in human thought initiated by Darwin and Wallace. Furthermore, since this year is the bicentenary of the tenth edition of the *Systema Naturae* by Linnaeus, the celebration of the Darwin-Wallace centenary was linked with ceremonies to honor the great advance in biological thought and practice initiated by the founder of modern biological nomenclature.

It was most appropriate that the Linnean Society should mark this date, not only because of Linnaeus but also because it was in the meeting room of this society that the reading of the Darwin-Wallace paper took place. It was also appropriate that the Congress of Zoology should make the work of Linnaeus, Darwin, and Wallace a central theme for the meetings.

The celebration was most auspiciously inaugurated on 1 July with a meeting in the Linnean Society room, just 100 years to the day after the first reading of the Darwin-Wallace paper. Here, in the presence of the president and the council of the society and of invited guests, a Darwin-Wallace memorial tablet was unveiled, in honor of the historic meeting of a century ago.

On the afternoon of 15 July, the day before the opening of the Congress of Zoology, a special Linnaeus-Darwin-Wallace meeting of the Linnean Society was held in the Memorial Hall of the Royal Geographical Society. At this meeting, presided over by C. F. A. Pantin, president of the Linnean Society, special Darwin-Wallace medals, struck in honor of the occasion, were presented to 20 outstanding biologists (or their representatives) for their contributions to modern biological and evolutionary theory and practice. The biologists so honored were as follows: Edgar Anderson, the late M. Caullery (who had died, at an advanced age, a few days before the meeting), Ronald Fisher, R. Florin, J. B. S. Haldane, Roger Heim, J. Hutchinson, Julian Huxley, Ernst Mayr, H. J. Muller, A. N. Pavlovsky, Bernhard Rensch, George Gaylord Simpson, C. J. F. Skottsberg, Erik A. Stensiö, Hamshaw Thomas, G. Turesson, Victor van Straelen, D. M. S. Watson, and the late J. C. Willis.

Following the presentation of the medals, A. Tindell Hopwood gave a paper on "The pre-Linnaean development of taxonomy," and A. J. Cain presented a paper on "The post-Linnaean development of taxonomy."

On the evening of this same day a *conversazione* was held at the rooms of the Royal Society, the Linnean Society, and the Geological Society in Burlington House. Guests were received by Cyril Hinshelwood, C. F. A. Pantin, and C. J. Stubblefield, the presidents, respectively, of the three societies. The guests then circulated through the rooms of the three societies, in which were displayed exhibits of Darwiniana and Wallaceiana. There was also a special showing of a film by H. B. D. Kettlewell, entitled

"Darwin and the insect adaptations of Brazil."

On the morning of the following day, 16 July, the inaugural meeting of the Zoological Congress was held in Albert Hall; Gavin de Beer presided. Various members of the Darwin and Wallace families were seated on the rostrum. Julian Huxley delivered a special Darwin-Wallace centenary address. He traced briefly the work of Darwin and Wallace and the events leading up to the presentation of their joint paper in 1858. He pointed out in particular how loath Darwin was to publish the results of his long and extended studies until he received the stimulus from Wallace, who had been thinking along lines exactly parallel to his own. He concluded by pointing out the fact that future evolutionary progress is to a large degree within the hands of mankind.

The scientific sessions of the congress followed for a week, and at many of these evolution was an important topic for discussion.

There were excursions for congress members to Darwin's home, Down House, and on one afternoon invited guests had the privilege and pleasure of meeting various members of the Darwin family there.

During the special meetings of the Linnean Society and throughout the congress meetings the names of Darwin, Wallace, and Linnaeus were signally honored. The summer of 1958 will remain ever memorable to biologists because of them.


EDWIN H. COLBERT
*American Museum of Natural History and Columbia University, New York, New York*


## Forthcoming Events

### February

*14.* Differentiation in Current Mating and Fertility Trends, intern. symp., New York, N.Y. (American Eugenics Soc., Inc., 230 Park Ave., New York 17.)

*15–19.* American Inst. of Mining, Metallurgical, and Petroleum Engineers, annual, San Francisco, Calif. (E. O. Kirkendall, AIME, 29 W. 39 St., New York 18.)

*16–19.* Problems in Field Studies in Mental Disorders, intern. work conf., New York, N.Y. (J. Zubin, American Psychopathological Assoc., 722 W. 168 St., New York 32.)

*20–21.* Epidemiology in Mental Disorders, annual meeting of the American Psychopathological Assoc., New York, N.Y. (J. Zubin, APA, 722 W. 168 St., New York 32.)

*23–27.* American Concrete Inst., 55th annual, Los Angeles, Calif. (W. A. Maples, A.C.I., 18263 W. McNichols Rd., Detroit 19, Mich.)

*25–26.* Midwest Industrial Radioisotopes Conf., Manhattan, Kan. (J. Kit-

chens, Dept. of Continuing Education, Kansas State College, Manhattan.)

*25–27.* Biophysical Soc., annual, Pittsburgh, Pa. (G. Felsenfeld, Dept. of Biophysics, Univ. of Pittsburgh, 325 Clapp Hall, Pittsburgh 13.)

*26–28.* American Acad. of Forensic Sciences, annual, Chicago, Ill. (W. J. R. Camp, AAFS, 1853 W. Polk St., Chicago 12.)

*26–28.* Genetics and Cancer, 13th annual symp. on fundamental cancer research, Houston, Tex. (Editorial Office, Univ. of Texas, M. D. Anderson Hospital and Tumor Inst., Texas Medical Center, Houston 25.)

*27–1.* National Wildlife Federation, 23rd annual convention, New York, N.Y. (NWF, 232 Carroll St., NW, Washington 12.)

### March

*1–2.* Pennsylvania Acad. of Sciences, Gettysburg. (K. Dearolf, Public Museum and Art Gallery, Reading, Pa.)

*1–5.* Gas Turbine Power Conf., Cincinnati, Ohio. (O. B. Schier, ASME, 29 W. 39 St., New York, N.Y.)

*7.* American Chemical Soc., Oklahoma Div., tetrasectional meeting, Tulsa. (J. W. Conant, ACS, Grand River Chemical Div. of Deere and Co., Pryor, Okla.)

*8–9.* American Broncho-Esophagological Assoc., Hot Springs, Va. (F. J. Putney, 1712 Locust St., Philadelphia, Pa.)

*8–9.* American Laryngological Assoc., Hot Springs, Va. (J. H. Maxwell, University Hospital, Ann Arbor, Mich.)

*8–12.* Aviation Conf., Los Angeles, Calif. (O. B. Schier, ASME, 29 W. 39 St., New York, N.Y.)

*10–12.* American Laryngological, Rhinological and Otological Soc., Hot Springs, Va. (C. S. Nash, 708 Medical Arts Bldg., Rochester 7, N.Y.)

*13–14.* American Otological Soc., Hot Springs, Va. (L. R. Boies, University Hospital, Minneapolis 14, Minn.)

*13–15.* Alabama Acad. of Sciences, Auburn. (H. M. Kaylor, Dept. of Physics, Birmingham-Southern College, Birmingham, Ala.)

*14–15.* Southwestern Soc. of Nuclear Medicine, 4th annual, New Orleans, La. (S. B. Nadler, SSNM, 1520 Louisiana Ave., New Orleans 15, La.)

*15–20.* American College of Allergists, San Francisco, Calif. (M. C. Harris, 450 Sutter St., San Francisco.)

*16–19.* American Assoc. of Petroleum Geologists, Soc. of Economic Paleontologists and Mineralogists, 44th annual, Dallas, Tex. (W. A. Waldschmidt, AAPG, 311 Leggett Building, Midland, Tex.)

*16–20.* American Inst. of Chemical Engineers, Atlantic City, N.J. (F. J. Van Antwerpen, AICE, 25 W. 45 St., New York 36.)

*16–20.* National Assoc. of Corrosion Engineers, 15th annual conf., Chicago, Ill. (NACE, Southern Standard Bldg., Houston, Tex.)

*16–20.* Western Metal Exposition and Cong., 11th, Los Angeles, Calif. (R. T. Bayless, 7301 Euclid Ave., Cleveland 3, Ohio)

*17–19.* National Health Council, Chi-

cago, Ill. (P. E. Ryan, 1790 Broadway, New York, 19.)

*18–25.* International Social Science Council, 4th general assembly (by invitation), Paris, France. (C. Levi-Strauss, Secretary-General, International Social Science Council, 19, avenue Kleber, Paris.)

*19–21.* Society for Research in Child Development, NIH, Bethesda, Md. (Miss N. Bayley, Laboratory of Psychology, National Inst. of Mental Health, Bethesda 14, Md.)

*23–26.* Institute of Radio Engineers, natl. conv., New York, N.Y. (G. L. Haller, IRE, 1 E. 79 St., New York 21.)

*24–27.* American Meteorological Soc., general, Chicago, Ill. (K. C. Spengler, AMS, 3 Joy Street, Boston, Mass.)

*27–28.* Michigan Acad. of Sciences, East Lansing. (D. A. Rings, Univ. of Michigan, Dept. of Engineering, Ann Arbor.)

*28.* South Carolina Acad. of Sciences, Columbia. (H. W. Freeman, Dept. of Biology, Winthrop College, Rock Hill, S.C.)

*29–3.* Latin American Congress of Chemistry, 7th, Mexico D.F., Mexico. (R. I. Frisbie, Calle Ciprès No. 176, Zone 4, Mexico, D.F.)

*30–1.* American Orthopsychiatric Assoc., San Francisco, Calif. (M. F. Langer, 1790 Broadway, New York 19.)

*30–12.* Bahamas Medical Conf., 7th, Nassau. (B. L. Frank, 1290 Pine Ave., W. Montreal, Canada.)

*31–2.* American Power Conf., 21st annual, Chicago, Ill. (N. S. Hibshman, AIEE, 33 W. 39 St., New York 18.)

*31–2.* Symposium on Millimeter Waves, 9th, New York, N.Y. (H. J. Carlin, Microwave Research Inst., 55 Johnson St., Brooklyn 1, N.Y.)

*31–5.* International Committee of Military Medicine and Pharmacy, 21st session. Paris, France. (Comité International de Médecine et de Pharmacie Militaires, Hôpital Militaire, 79, rue Saint Laurent, Liège, Belgium.)

### April

*1–3.* American Assoc. of Anatomists, Seattle, Wash. (B. Flexner, Univ. of Pennsylvania Medical School, Philadelphia 4, Pa.)

*1–4.* National Council of Teachers of Mathematics, Dallas, Tex. (H. T. Karnes, Dept. of Mathematics, Louisiana State Univ., Baton Rogue 3.)

*1–4.* National Science Teachers Assoc., 7th natl. conv., Atlantic City, N.J. (R. H. Carlton, NSTA, 1201 16 St., NW, Washington 6.)

*1–4.* Neurosurgical Soc. of America, Hot Springs, Va. (F. P. Smith, 260 Crittenden Blvd., Rochester, 20, N.Y.)

*1–29.* World Meteorological Organization, 3rd session of congress, Geneva, Switzerland. (WMO, Campagne Rigot, 1, avenue de la Paix, Geneva.)

*2–3.* Electrically Exploded Wires, conf., Boston, Mass. (W. G. Chace, Thermal Radiation Laboratory, CRZCM, Geophysics Research Directorate, Air Force Cambridge Research Center, Bedford, Mass.)

*2–4.* Association of American Geographers, 55th annual, Pittsburgh, Pa. (J. E. Guernsey, 9707 Parkwood Dr., Bethesda, Md.)

*2–4.* Association for Computing Machinery, Cleveland, Ohio. (J. Moshman, Corporation for Economic and Industrial Research, 1200 Jefferson Davis Highway, Arlington 2, Va.)

*2–4.* Optical Soc. of America, New York, N.Y. (S. S. Ballard, Dept. of Physics, Univ. of Florida, Gainesville.)

*3–4.* Eastern Psychological Assoc., Atlantic City, N.J. (C. H. Rush, Standard Oil Co. of New Jersey, Rockefeller Plaza, New York, N.Y.)

*3–5.* American Soc. for the Study of Sterility, Atlantic City, N.J. (H. H. Thomas, 920 S. 19 St., Birmingham 5, Ala.)

*3–5.* Cooper Ornithological Soc., Berkeley, Calif. (J. Davis, Univ. of California, Hastings Reservation, Jamesburg Route, Carmel Valley.)

*5–9.* American College of Obstetricians and Gynecologists, Atlantic City, N.J. (J. C. Ullery, 15 S. Clark St., Chicago 3, Ill.)

*5–10.* American Chemical Soc., 135th, Boston, Mass. (M. A. H. Emery, 18th and K St., NW, Washington, D.C.)

*5–10.* Nuclear Congress, Cleveland, Ohio. (S. Baron, Burns & Roe, Inc., 160 West Broadway, New York 13.)

*6.* Paleontological Research Institution,

Ithaca, N.Y. (R. Harris, 109 Dearborn Rd., Ithaca.)

*6–7.* Chemical and Petroleum Instrumentation, 2nd natl. symp., St. Louis, Mo. (H. S. Kindler, Director of Technical and Educational Services, ISA, 313 Sixth Ave., Pittsburgh 22, Pa.)

*6–8.* American Radium Soc., Hot Springs, Va. (R. L. Brown, Robert Winship Clinic, Emory Univ., Atlanta 22, Ga.)

*6–8.* Astronautics, AFOSR 3rd annual symp., Washington, D.C. (Headquarters, Air Force Office of Scientific Research, Washington 25.)

*6–8.* National Open Hearth Steel Furnace, Coke Oven and Raw Materials Conf., St. Louis, Mo. (E. O. Kirkendall, AIME, 29 W. 39 St., New York 18.)

*6–9.* American Acad. of General Practice, San Francisco, Calif. (M. F. Cahal, Volker Blvd. at Brookside, Kansas City 12, Mo.)

*6–11.* Coordination Chemistry, intern. conf., London, England. (Chemical Soc., Burlington House, London, W.1.)

*12–13.* American Soc. for Artificial Internal Organs, Atlantic City, N.J. (C. K. Kirby, ASAIO, 110 Maloney Bldg., University Hospital, 3600 Spruce St., Philadelphia 4, Pa.)

*12–16.* American Physiological Soc., Atlantic City, N.J. (R. C. Daggs, 9650 Wisconsin Ave., Washington, D.C.)



*12–16.* Fracture, intern. conf., Cambridge and Dedham, Mass. (Headquarters, Air Force Office of Scientific Research, Washington 25.)

*13.* Biochemical Cytology of Liver (Histochemical Soc.), symp., Atlantic City, N.J. (A. B. Novikoff, Dept. of Pathology, Albert Einstein College of Medicine, Yeshiva Univ., Eastchester Rd. and Morris Ave., New York 61.)

*13–15.* Hydraulics Conf. (American Soc. of Mechanical Engineers), Ann Arbor, Mich. (O. B. Schier, ASME, 29 W. 39 St., New York 18.)

*13–17.* American Assoc. of Immunologists, Atlantic City, N.J. (C. Howe, 630 W. 168 St., New York 32.)

*13–17.* American Inst. of Nutrition, Atlantic City, N.J. (G. M. Briggs, NIAMD, Room 9D20, Bldg. 10, National Institutes of Health, Bethesda, Md.)

*13–17.* American Soc. for Pharmacology and Experimental Therapeutics, Atlantic City, N.J. (H. Hodge, Univ. of Rochester, Rochester 20, N.Y.)

*13–18.* American Acad. of Neurology, Los Angeles, Calif. (J. M. Foley, Boston City Hospital, Boston, Mass.)

*13–18.* American Soc. of Biological Chemists, Atlantic City, N.J. (F. W. Putnam, Univ. of Florida Medical School, Gainesville.)

*13–18.* American Soc. for Experimental Pathology, Atlantic City, N.J. (J. F. A. McManus, Univ. of Alabama Medical Center, Birmingham 3.)

*14–15.* Electrical Heating Conf. (American Institute of Electrical Engineers), Philadelphia, Pa. (N. S. Hibshman, AIEE, 33 W. 39 St., New York 18.)

*14–16.* Life Span of Animals, 5th colloquium on aging, London, England. (Ciba Foundation, 41 Portland Pl., London, W.1.)

*14–16.* Rheology of the Glassy State (British Soc. of Rheology), Sheffield, England. (D. W. Saunders, British Rayon Research Assoc., Heald Green Laboratories, Wythenshawe, Manchester 22, England.)

*15–17.* American Assoc. of Genito-Urinary Surgeons, Absecon, N.J. (W. J. Engel, 2020 E. 93 St., Cleveland 6, Ohio.)

*15–17.* American Surgical Assoc., San Francisco, Calif. (W. A. Altemeier, Cincinnati General Hospital, Cincinnati 29, Ohio.)

*16–18.* American Assoc. of Railway Surgeons, Chicago, Ill. (C. C. Guy, 5800 Stony Island Ave., Chicago 37.)

*16–18.* Association of South Eastern Biologists, Knoxville, Tenn. (H. J. Humm, Dept. of Botany, Duke Univ., Durham, N.C.)

*16–18.* Ohio Acad. of Sciences, Columbus. (G. W. Burns, Ohio Wesleyan Univ., Delaware.)

*16–30.* Engineering, Marine, Welding and Nuclear Energy Exhibition, 22nd, Olympia, London. (F. W. Bridges & Sons, Ltd., Grand Buildings, Trafalgar Square, London. W.C.2, England.)

*17.* Current Developments in the Production of High Vacua, symp., London, England. (Institute of Physics, 47 Belgrave Square, London, S.W.1.)

*17–18.* Nebraska Acad. of Sciences, 69th annual, Lincoln. (M. Beckman, Teachers College, Univ. of Nebraska, Lincoln.)

*18–22.* American Soc. of Tool Engi-

# THE SPECIES PROBLEM

**AAAS SYMPOSIUM VOLUME NO. 50**
**Edited by Ernst Mayr, Harvard University**
**6 x 9 in., 404 pp., references, index, clothbound, October 1957**
**Price $8.75; special cash order price for AAAS members $7.50**

The symposium was arranged by the Association of Southeastern Biologists and cosponsored by AAAS Sections F and G, as well as four other societies. Most papers are published essentially as given in Atlanta in December 1955. Dr. T. M. Sonneborn, however, undertook a comprehensive survey of the species problem in the protozoans and particularly in the ciliates. His masterly synthesis comprising more than two-fifths of the volume is a fundamental contribution to the protozoan literature.

This symposium made a solid contribution toward the solution of the species problem. It broadened the base on which to discuss the problem by utilizing new organisms. It led to a clarification of the areas of general agreement among biologists. It presented a clear statement of the various species concepts and frankly stated and enumerated difficulties in their application to different types of natural populations. Finally, it illuminated certain aspects of the ageless species problem that had been neglected previously, and it attempted a statement of still controversial issues. From these papers it should be evident that the species problem is still one of the important issues in biology.

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