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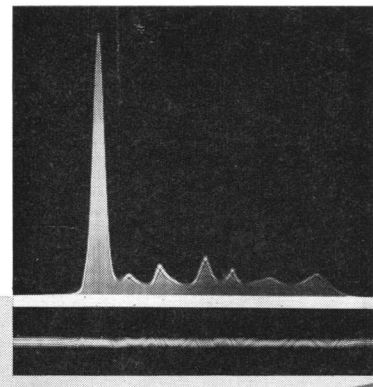
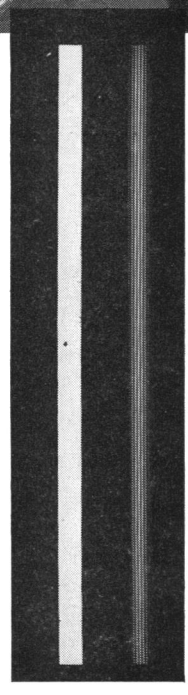


Electrophoresis of human serum diluted 1:6; ascending boundaries. Inclined knife-edge schlieren and Rayleigh fringes.



Typical reference fringe pattern obtained from standard production model.

ELECTROPHORESIS AND DIFFUSION

in one precision instrument

As protein research progresses, biochemists rely more and more upon instruments of high precision for diffusion and electrophoresis studies. Especially critical are the optical measurements needed to obtain accurate diffusion coefficients, absolute electrophoretic mobilities, and information on purity.

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or not by the taking of this medicine. In the 1920's, while doing research on cancerous cells, Warburg found a reduced cellular metabolism, with intensified fermentation. For a long time it was not possible to repeat these experiments in other laboratories, because of the extreme difficulty of the measuring technique, but, through the use of isotopes, these results have been confirmed and carried further. Today we consider tumorous cells to be deteriorated cells, marked by certain morphological structures, and we notice a loss of the mitochondria. This degeneration can also be noticed in the metabolism of these cells through the loss of certain enzyme systems, like respiration ferments. This can be caused through the inhalation of destructive matter or through wrong nutrition during part of the lifetime of an organism, or as a result of other, not yet defined, injuries.

In the last few years it has been possible to combine many single results, and in this way it was found, for instance, that the activity of the cytochrome oxidase and the oxysuccinic acid in sarcomas are only one-fifth those in normal liver cells. A reduction of the catalase content was also noted. The effect of effective cytostatica, like triosephosphate dehydrogenase, for instance, today can be seen in these enzyme systems. Lewisite compounds not only made tumors disappear but also caused tumors, and thus could only be used within limitations. Arsenic and heavy metals (such as lead and gold) are not in great use any more today. But great interest was aroused in the group of the antimetabolites, which include the cytostatica. These were able to prolong the life of leukemia-stricken children by years. Specific and nonspecific albumin therapy in the meantime also brought some success. Cortisone alone or in combination with mercaptopurine showed certain results. Further research is in progress on ways to increase the prophylactic forces in the organism by extracting preparations from tissues immune to tumors. These substances, however, cannot be considered as real cytostatica. The treatment with heterosexual hormones brought good results with carcinoma of the prostate, but there is the fundamental question whether the majority of these tumors can still be considered as genuine cancer. Overdoses, which are quite often given, result in an inverse effect (mammary gland carcinoma). Among the antibiotics there can also be found cytostatic substances, such as actinomycin C and D, which show success with lymphogranulomatosis and Hodgkin's disease. In the meantime new actinomycins have been found, but they have not yet been used in clinics. "That there really are chemotherapeutical drugs to cure cancer has never been stated in any scientific publication, nor has it ever been mentioned in any lecture, only in noncritical newspapers and magazines," stated Domagk.

We can talk about a supplementary chemotherapy of cancer, and in this connection the so-called ethylene iminochinones are of special interest. These substances, belonging to the groups of the cytostatica, not only retard the growth of tumors but also inhibit the growth of normal human, animal, and plant cells. With these substances, the germination of wheat can be stopped. Therefore care must be exercised in administering these drugs in people who are capable of procreation, since these substances are able to change the genes, just like x-rays and other radioactive rays.

These cytostatica can be used only on patients with tumors on which it is too late to operate, and we should be grateful that in this way we are able to prolong the life of the patient under tolerable circumstances. E 39, in the form that is soluble in water, promises a better method of application, as has already been observed on animals which were under constant control for 45 days. It could be confirmed by microscopic examination that tumors of the size of walnuts had decreased considerably. But

one should not be misled by these experiments, since some animals, when under treatment, refuse all food. But during the experiments described above the animals gained weight, which means that E 39 has a "tumor specific" effect.

With surgery we try to eliminate the tumorous cells as completely as possible, but success is very rare, especially when one considers the metastases. Good results are also obtained by means of radiation therapy, but in this treatment one must consider that radiation therapy also destroys the natural prophylactic forces of the body. Therefore the smallest dose possible is applied in therapy for malignant tumors, and one has to be extremely careful to hit the tumorous cells only. By now it is very well known which tumors are best removed through surgery and which ones should be exposed to radiation therapy. Chemotherapy is applied only to tumors which can neither be removed through surgery nor treated with irradiation, and so the chemotherapy has by far the most difficult task to accomplish. It therefore cannot be expected that all treatments of malignant tumors by chemotherapy can be successful. Lately, intravenous injections of ethylenimine compounds have been rather successful. Whether the climate of the North Sea has something to do with the success of these treatments is hard to determine. Research is being done on these questions at the University Clinic for Throat, Nose, and Ear in Münster in Westfalen, Germany.

It must be understood that a body stricken with cancer generally is a weakened organism, a fact which is also to be taken into account in regular treatments. The individual thus stricken should seek rest and a suitable climate for the chemotherapeutical, surgical, and radiation treatments. These requirements are even more important for the cancer patient than they are for the tuberculosis patient. We know from experience that in a case of oxygen deficiency—that is to say, in a poorly aired room—animal tumors grow faster than in the climate of the North Sea. The living conditions of people in big cities become more and more unnatural as a result of exhaust fumes, dust, and so forth, and thus the number of cases of cancer will steadily increase. To quote Domagk: "In therapy we will have to be satisfied, for the present at least, with a certain equilibrium between body cell and tumorous cell, even if the tumor cannot be completely eliminated. We will be satisfied if we can slow down its growth, in order to preserve the life of the patient longer and under bearable conditions. In this case too, we have to learn to think more physiologically and less naively. The chemotherapy of cancer still is in its very beginning and will have to be further extended. The observations we have collected to the present day show that not only leukemia but also carcinomas and sarcomas can be influenced through cytostatica. This seems to be the most important result for the further development of the therapy. The results of these experiments can be related to the treatment of different malignant tumors in man, at least in principle, and this is decisive for further experiments."

Antibiotics

"The influence of antibiotics on human society has been so tremendous that one was almost tempted to call the present era the age of the antibiotics instead of the atomic age." With these words, Selman A. Waksman (New Brunswick, N.J., U.S.A.), started his talk on the social significance of the antibiotics. This scientist, who was awarded the Nobel prize for physiology and medicine in 1952, is the discoverer of streptomycin, which has shown good results in the treatment of tuberculosis in particular.

Through the progress of practical medicine and public health efforts, the life expectancy of man, which was about 30 years in the 18th century, has been increased to about 70 years. If medicine continues to develop at the

same pace, the life expectancy should reach almost 100 years by the end of this century. These prolongations of the life span can be explained through the fact that diseases, particularly in infancy, are much better controlled than they used to be. Although tuberculosis could be controlled to a certain extent one hundred years ago, nevertheless 500 out of every 100,000 persons died (this includes deaths in all countries of the world). Last year the mortality in the United States and in some European countries was down to about 10 per 100,000. Streptomycin, the first of the drugs used in the medical treatment of tuberculosis, was soon followed by others, such as para-aminosalicylic acid. Lately it has been discovered that isonicotinic acid hydrazide has healing effects in tuberculosis. Since 1940, the year of the discovery of the first antibiotic, many epidemics and infectious diseases have been treated with great success—diesases such as pneumonia, syphilis, typhoid fever, typhus, tularemia, undulant fever, plague, and cholera.

The amazing success of the application of antibiotics also caused great social changes, which I will discuss shortly. The almost complete abolition of diseases of childhood as a result of the use of antibiotics can be shown best in the figures on tubercular meningitis. Until 1946, with no chemotherapy available for this disease, the mortality was 100 percent. In 1947, with the introduction of streptomycin, the mortality was 80 percent. In 1950, with para-aminosalicylic acid therapy also in use, the mortality was 50 percent. And in 1953, with isonicotinic acid hydrazide complementing the other two drugs, mortality was down to 15 percent. Countries which previously had a great mortality among infants, which served as a brake on the constant rise of the population, now are facing serious problems in the fields of economics and population policy, such as birth control.

The prolongation of the life span of the average human being poses the problem of finding ways to look after older people and of finding work for them. Countries which are already overpopulated and have a steadily increasing number of jobless people face a serious social problem. A slow decrease in the number of hospitals and sanatoria can be predicted. Just consider the formerly prolonged treatment of tuberculosis. The increased tendency toward ambulatory treatment of patients should not be overlooked, either. In the future, a short period in the hospital will be followed by treatment on the outside by the family physician. Greater safety in the use of vaccine preparations has been made particularly evident with the development of vaccines against virus infections such as poliomyelitis. An increase in the production of food has been

made possible through elimination of various infectious diseases in plants and animals and, moreover, improvements in food preservation have been made by adding antibiotics to food products. Another tremendous area of progress is that of the psychological attitude toward disease. There need be, in the future, no more panic and fear of epidemics and diseases which used to decimate the human race. The fact that venereal diseases can be controlled harbors also a great danger and may lead to an unimaginable degree of carelessness concerning mental and physical hygiene. The appearance of certain new diseases needs definite attention. This fact is connected with the reduction of natural resistance. Nevertheless, one should not overemphasize this problem.

The situation of the physicians has changed too. They have at their disposal a great many antibiotics which they can use, but they have to judge in each case whether, by killing the primary cause of the disease, they may not activate a secondary disease germ. No physician should allow himself to let antibiotics replace his reasoning.

The extensive use of antibiotics is another social aspect. In the first place, there exists the tendency toward self-treatment. Then there is the patient's expectation of a rapid cure, and if it is not forthcoming, he blames the physician or the antibiotic. As Waksman remarked, "In the case of severe chronic diseases or diseases of unknown etiology, such as cancer, many have come to expect miracles from newly discovered antibiotics and other drugs. Excessive promises have been made, even to the effect that 'cures' will be forthcoming after so much money has been spent for research."

Paul Hermann Müller (Basel, Switzerland), who was awarded the Nobel prize in 1948 for his discovery of DDT as a contact poison, talked about the further development of the antibiotics and application in agriculture. Ever since 1942, the so-called "antibiotics era," more than 3500 different substances with antibiotic effect have been discovered, but only 17 preparations have been made available commercially. It is surprising to see their fast spread and increased use in many fields. Since 1950, the production of these extremely helpful chemicals has tripled.

New applications for the protection of staple goods and plants, and in agriculture, are constantly found. In the use of antibiotics for plant protection, the most limited range of action is against fungi; yet the fungus diseases are more important than the bacteria against which the antibiotics have a relatively broad range of action.

One of the few antbiotics with a definite fungicide effect is cycloheximid or actidion, which is a by-product in the production of streptomycin. Actidion is effective against mildew and mint rust and is also used against the disease of cherry trees (Schrotschuss) caused by *Clasteroporium carpophilum* AD. In contradistinction to inorganic fungicides it can be used on fruit-bearing trees. For the protection of stored food, and in animal breeding, antibiotics are used more and more. In 1954 about 250 tons were added to animal food, as a growth stimulant. The cause of this effect, however, could not be explained definitely. Thus it is understandable that a certain skepticism still prevails.

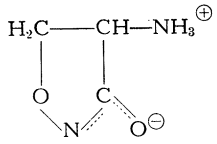
New experiments, carried on mostly in Germany, show that effects similar to those produced by antibiotics can be obtained with ordinary substances (for example, nasturtium or horseradish) without side effects (for example, change in the intestinal flora).

The addition of antibiotics to easily perishable foods also presents a certain danger, which should not be overlooked; it creates the possibility that human beings may be constantly given small, uncontrolled amounts of antibiotics. As a result, there is the possibility of a gradual development of resistance by important pathogenic bacteria. Besides this, a change in the intestinal flora may

also appear. In view of these reasons, it is forbidden in the United States to add antibiotics to uncooked food.

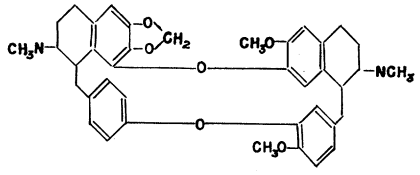
In the last three years, more antibiotics have been introduced; these I will mention briefly:

Cycloserine: This has a very broad range of action on Gram-positive and Gram-negative bacteria and against strains of *Mycobacterium tuberculosis.* It is a 4-amino-3-isoxazolidon with a relatively good stability in an alkaline environment, and has the following structure:



Gonyleptidin: This antibiotic was isolated from the glands of a South African spider of the Gonyleptidae family, and is effective against 18 kinds of bacteria. It consists of a mixture of various benzochinones in which 2,3-dimethyl-, 2,5-dimethyl-, and 2,3,5-trimethyl benzochinone predominate.

Cefaranthin: This is an alkaloid and antibiotic, isolated from the roots of the *Stephania cepharantha* Hayata. It is effective as a preventive for tuberculosis, leprosy, and whooping cough, and inactivates snake poison and toxine of tetanus. It has the following structure:



In this connection, gibberellic acid should also be mentioned. This is not a real antibiotic but, in very small amounts, has physiological effects. The active material, which is extracted from the mushroom *Gibberella fujkuroi,* strongly influences the growth of plants. In this way the growth of geraniums, roses, sunflowers, beans, pepper, corn, and so on, can be tripled after 4 weeks of treatment. But for application on a large scale in agriculture, more practical experience with this new product is needed.

H. ROTTA

Stuttgart, Germany

We are indebted to Mrs. Heidi Steffen of Purdue University for translating this report from the German.

Forthcoming Events

November

12–15. Society of Naval Architects and Marine Engineers, 66th annual, New York, N.Y. (W. N. Landers, SNAME, 74 Trinity Pl., New York 6.)

16–21. Radiological Soc. of North

America, Chicago, Ill. (D. S. Childs, 713 E. Genesee St., Syracuse, N.Y.)

16–23. Scientific Information, intern. conf., Washington, D.C. (Mrs. M. Sheppard, Intern. Conf. on Scientific Information, Natl. Acad. of Sciences–Natl. Research Council, 2101 Constitution Ave., Washington 25.)

17–19. Association of Military Surgeons of the U.S., Washington, D.C. (R. E. Bitner, Suite 718, New Medical Bldg., 1726 Eye St., NW, Washington 6.)

17–20. Conference on Magnetism and Magnetic Materials, Philadelphia, Pa. (H. B. Callen, Dept. of Physics, Univ. of Pennsylvania, Philadelphia.)

17–22. Radiological Soc. of North America, Chicago, Ill. (D. S. Childs, Sr., 713 E. Genesee St., Syracuse 2, N.Y.)

18–20. Air Pollution, 1st natl. conf., Washington, D.C. (Dept. of Health, Education, and Welfare, U.S. Public Health Service, Washington 25.)

18–20. Standards, 9th natl. conf., New York, N.Y. (American Standards Assoc., 70 E. 45 St., New York, N.Y.)

18–21. Weather Radar Conf., 7th, Miami Beach, Fla. (K. C. Spengler, American Meterological Soc., 3 Joy St., Boston 8, Mass.)

18–22. Pan-American Dental Cong., Mexico City, Mexico. (Association Dental Mexicana, Sinaloa 9, Mexico 7, DF, Mexico.)

19–21. Electrical Techniques in Medicine and Biology, 11th annual conf., Minneapolis, Minn. (O. H. Schmitt, Univ. of Minnesota, Minneapolis.)

20–22. Acoustical Soc. of America, 56th meeting, Chicago, Ill. (K. Kramer, 3839 Grand Ave., Western Springs, Ill.)

20–22. American College of Cardiology, New Orleans, La. (P. Reichert, Empire State Bldg., New York 1.)

20–22. International Symp. on Tuberculosis, Philadelphia, Pa. (M. J. Schwartz, Deborah Sanatorium & Hospital, 642 Widener Bldg., Philadelphia 7.)

20–23. American Anthropological Assoc., Washington, D.C. (W. S. Godfrey, Jr., APA Logan Museum, Beloit College, Beloit, Wisc.)

20–23. European Confederation of Agriculture, Vienna, Austria. (M. H. Abegg, Confédération Européenne Agriculture, Brougg (Argovie), Switzerland.)

21–22. American Soc. of Animal Production, annual, Chicago, Ill. (H. H. Stonaker, Animal Husbandry Dept., Colorado State Univ., Fort Collins, Col.)

24–26. Fluid Dynamics, division of American Physical Soc., San Diego, Calif. (R. J. Emrich, Dept. of Physics, Lehigh Univ., Bethlehem, Pa.)

24–26. Mechanisation of Thought Processes, symp., Teddington, Middlesex, England. (The Secretary, Natl. Physical Lab., Teddington, Middlesex.)

24–6. Plant Specialists, 4th Latin American conf., Santiago, Chile. (R. Cortazar, Departmento de Investigaciones Agricolas, Ministerio de Agricultura Casilla 4088, Santiago, Chile.)

27-29. Central Assoc. of Science and Mathematics Teachers, 58th annual, Indianapolis, Ind. (N. G. Sprague, Indianapolis Public Schools, 1644 Roosevelt Ave., Indianapolis 18.)

28–6. International Conf. of Social Work, 9th intern., Tokyo, Japan. (J. R. Hoffer, Intern. Conf. of Social Work, 345 East 46 St., New York 17, N.Y.)

30–5. American Soc. of Mechanical Engineers, 79th annual, New York, N.Y. (O. B. Schier, ASME, 29 W. 39 St., New York 18.)

December

1–3. American Soc. of Refrigerating Engineers, New Orleans, La. (R. C. Cross, ASRE, 234 Fifth Ave., New York 1.)

1–4. Entomological Soc. of America, Salt Lake City, Utah. (R. H. Nelson, 1530 P St., NW, Washington, D.C.)

1–5. American Rocket Soc., 13th annual, New York, N.Y. (A. F. Denham, 925 Book Bldg., Detroit 26, Mich.)

2. Scientific Study of Glass, 11th technical meeting of the European Union, Paris, France. (Société française de céramique, 44, rue Copernic, Paris 16e.)

2–4. Electric Steel Furnace Conf., 17th, Cleveland, Ohio. (E. O. Kirkendall, AIME, 29 W. 39 St., New York 18.)

2–5. American Medical Assoc., clinical meeting, Minneapolis, Minn. (G. F. Lull, 535 N. Dearborn St., Chicago, Ill.)

3. Animal Care Panel, 9th annual, Chicago, Ill. (R. J. Flynn, Argonne Natl. Laboratory, Lemont, Ill.)

3–5. American Inst. of Electrical Engineers, St. Petersburg, Fla. (N. S. Hibsham, AIEE, 33 W. 39 St., New York 18.)

3–5. Eastern Joint Computers Conf., Philadelphia, Pa. (G. W. Bailey, IRE, 1 E. 79 St., New York 21.)

3–5. Global Communications, 2nd natl. symp., St. Petersburg Beach, Fla. (M. R. Donaldson, 1501 72 St. N., St. Petersburg.)

4–5. Vehicular Communications, annual, Chicago, Ill. (G. W. Bailey, IRE, 1 E. 79 St., New York 21.)

5–7. American Psychoanalytic Assoc., New York, N.Y. (J. N. McVeigh, APA, 36 W. 44 St., New York 36.)

6. American Rheumatism Assoc., Rochester, Minn. (E. F. Hartung, ARA, 580 Park Ave., New York, N.Y.)

6–11. American Acad. of Dermatology and Syphilology, Chicago, Ill. (R. R. Kierland, Mayo Clinic, Rochester, Minn.)

7–10. American Inst. of Chemical Engineers, annual, Cincinnati, Ohio. (F. J. Van Antwerpen, 25 W. 45 St., New York, N.Y.)

8–10. American Nuclear Soc., winter, Detroit, Mich. (ANS, P.O. Box 963, Oak Ridge, Tenn.)

9–10. Conference on Learning Effectiveness, Univ. of Pennsylvania, Philadelphia, Pa. (Air Force Office of Scientific Research, Air Research and Development Command, U.S. Air Force, Washington 25.)

10–16. American Acad. of Optometry, annual, Boston, Mass. (C. C. Koch, 1502 Foshay Tower, Minneapolis, Minn.)

12–13. Association for Research in Nervous and Mental Disease, annual, New York, N.Y. (R. J. Masselink, 700 W. 168 St., New York 32.)

15–17. American Soc. of Agricultural Engineers, winter, Chicago, Ill. (J. L. Butt, American Soc. of Agricultural Engineers, St. Joseph, Mich.)

15–19. Radiation Biology, 2nd Australian conf., Melbourne, Australia. (J. H. Martin, Physics Dept., Cancer Inst. Board, 483 St. Lonsdale St., Melbourne, Victoria.)

17. Institute of Aeronautical Sciences, Washington, D.C. (R. R. Dexter, IAS, 2 E. 64 St., New York 21.)

18–20. American Physical Soc., Los Angeles, Calif. (K. K. Darrow, APS, Columbia Univ., New York 27.)

26–31. American Assoc. for the Advancement of Science, annual, Washington, D.C. (R. L. Taylor, AAAS, 1515 Massachusetts Ave., NW, Washington 5, D.C.)

The following 47 meetings are being held in conjunction with the AAAS annual meeting.

AAAS Committee on the Social Aspects of Science (C. D. Leake, Ohio State Univ. College of Medicine, Columbus, Ohio). 27 Dec.

AAAS Cooperative Committee on the Teaching of Science and Mathematics (J. W. Buchta, Univ. of Minnesota, Minneapolis, Minn.). 28 Dec.

Academy Conf. (J. A. Yarbrough, Meredith College, Raleigh, N.C.). 27–28 Dec.

Alpha Epsilon Delta (M. L. Moore, 7 Brookside Circle, Bronxville, N.Y.). 27 Dec.

American Assoc. of Clinical Chemists (Miss E. G. Frame, Clinical Center, Natl. Institutes of Health, Bethesda 14, Md.). 29–30 Dec.

American Assoc. of Scientific Workers (R. J. Rutman, 6331 Ross St., Philadelphia 44, Pa.).

American Astronautical Soc. (R. Fleisig, 58 Kilburn Rd., Garden City, N.Y.). 27–30 Dec.

American Geophysical Union (W. E. Smith, AGU, 1515 Massachusetts Ave., NW, Washington 5).

American Meteorological Soc. (K. Spengler, 3 Joy St., Boston, Mass.).

American Nature Soc. (S. Mulaik, Biology Dept., Univ. of Utah, Salt Lake City). 26–30 Dec.

American Physiological Soc. (F. A. Hitchcock, Ohio State Univ., Columbus).

American Political Science Assoc. (E. M. Kirkpatrick, APSA, 1726 Massachusetts Ave., NW, Washington, D.C.). 27 Dec.

American Psychiatric Assoc. (L. J. West, Univ. of Oklahoma School of Medicine, Oklahoma City 4). 27–28 Dec.

American Soc. of Criminology (D. E. J. MacNamara, Dean, New York Inst. of Criminology, Inc., 40 E. 40 St., New York 16). 27–28 Dec.

American Soc. of Naturalists (J. Schultz, Inst. for Cancer Research, Philadelphia, Pa.).

American Soc. of Photogrammetry (R. G. Ray, U.S. Geological Survey, Washington 25). 29 Dec.

American Soc. of Zoologists (G. Moment, Dept. of Biology, Goucher College, Towson, Baltimore 4, Md.). 27–29 Dec.

American Sociological Soc. (K. Davis, Inst. of International Studies, Univ. of California, Berkeley 4). 29 Dec.

Association of American Geographers, Middle Atlantic Div. (J. E. Guernsey,

9707 Parkwood Dr., Bethesda, Md.). 29 Dec.

Association for Computing Machinery (J. Douglas, Mathematics Dept., Rice Inst., Houston, Tex.).

Astronomical League (Miss G. C. Scholz, 410 Mason Hall Apts., Alexandria, Va.). 26 Dec.

Biometric Soc. (J. Cornfield, Johns Hopkins Univ., Baltimore, Md.). 30 Dec.

American Statistical Assoc. (E. Glazer, 305 George Mason Dr., Falls Church, Va.). 30 Dec.

Conference on Scientific Communication Problems (G. L. Seeilstad, Technical Reports Group, Applied Physics Lab., Johns Hopkins Univ., Silver Spring, Md.). 28–30 Dec.

Conference on Scientific Manpower (T. J. Mills, National Science Foundation, Washington 25). 30 Dec.

Ecological Soc. of America (D. E. Davis, Johns Hopkins Univ., School of Hygiene, Baltimore, Md.).

History of Science Soc. (M. C. Leikind, 1334 Aspen St., NW, Washington 12). 29 Dec.

Instrument Soc. of America (O. L. Linebrink, Battelle Memorial Inst., Columbus, Ohio). 30 Dec.

International Geophysical Year (H. Odishaw, National Acad. of Sciences, Washington 25). 29–30 Dec.

Junior Scientists Assembly (K. C. Johnson, Supervising Director of Science, District of Columbia Public Schools, Woodrow Wilson High School, Washington 16). 27–28 Dec.

Metric Assoc. (J. T. Johnson, 694 W. 11 St., Claremont, Calif.).

National Acad. of Economics and Political Science (D. P. Ray, Hall of Government, George Washington Univ., Washington, D.C.). 27 Dec.

National Assoc. of Biology Teachers (P. Klinge, Jordan Bldg., Indiana Univ., Bloomington). 26–30 Dec.

National Assoc. for Research in Science Teaching (E. S. Obourn, U.S. Office of Education, Washington 25). 26–30 Dec.

National Assoc. of Science Writers (J. Billard, U.S. News and World Report, Washington, D.C.).

National Geographic Soc. (W. R. Gray, NGS, 16 and M Sts., NW, Washington 6). 30 Dec.

National Science Teachers Assoc. (W. A. Kilgore, District of Columbia Teachers College, Washington 9). 26–30 Dec.

National Speleological Soc. (W. E. Davies, 125 Greenway Blvd., Falls Church, Va.). 28–29 Dec.

Philosophy of Science Assoc. (C. W. Churchman, Case Inst. of Technology, Cleveland, Ohio).

Pi Gamma Mu (Mrs. Effie B. Urqhart, Winfield, Kan.).

Scientific Research Soc. of America (D. B. Prentice, 56 Hillhouse Ave., New Haven 11, Conn.).

Sigma Delta Epsilon (Mrs. V. L. Blackford, 2630 Adams Mill Rd., NW, Washington 10). 26–30 Dec.

Society for General Systems Research (R. L. Meier, Mental Health Research Inst., Univ. of Michigan, Ann Arbor). 29 Dec.

Society for Industrial Microbiology, Washington section (W. N. Ezekiel, Bur. of Mines, Washington 25). 27–28 Dec.

Society of the Sigma Xi (T. T. Holme, 56 Hillhouse Ave., New Haven 11, Conn.). 29 Dec.

Society of Systematic Zoology (G. W. Wharton, Dept. of Zoology, Univ. of Maryland, College Park).26–30 Dec.

United Chapters of Phi Beta Kappa (C. Billman, 1811 Q St., NW, Washington, D.C.). 27 Dec.

Washington Acad. of Sciences (G. W. Irving, ARS, U.S. Dept. of Agriculture, Washington 25).

27–29. American Economic Assoc., Chicago, Ill. (J. W. Bell, AEA, Northwestern Univ., Evanston, Ill.)

27–29. Econometric Soc., Chicago, Ill. (R. Ruggles, Box 1264 Yale Station, Yale Univ., New Haven, Conn.)

27–30. American Folklore Soc., New York, N.Y. (MacE. Leach, AFS, Univ. of Pennsylvania, Philadelphia, Pa.)

28–30. Archaeological Inst. of America, Cincinnati, Ohio. (L. A. Campbell, AIA, Dept. of Classics, Brooklyn College, Brooklyn, N.Y.)

29–30. National Council of Teachers of Mathematics, New York, N.Y. (M. H. Ahrendt, NCTM, 1201 16 St., NW, Washington 6.)

28–30. Western Soc. of Naturalists, Seattle, Wash. (J. P. Harville, San Jose State College, San Jose 14.)