netism appear to be very different from the liquid-vapor phase transition or the phase transition of a binary liquid mixture, they have very similar descriptions in statistical thermodynamic theory and it is possible to make a “dictionary” which permits the translation from the magnetic to the liquid-vapor use and vice versa. Magnetization thus corresponds to difference between the densities of the liquid and vapor phases; susceptibility corresponds to compressibility and the relation of the magnetic field to magnetization corresponds to the relation of the pressure to volume in a gas. Benedek’s talk was thus concerned with the same “exponents” as Rowlinson’s. Perhaps the most striking feature of the magnetic experimental data is the fact that the coefficient \( \beta \) which describes the magnetization curve is very close to \( \frac{1}{3} \). This result was obtained in a classic experiment by Heller and Benedek by using the nuclear magnetic resonance frequency as a probe of the internal field.

Recent work as well as recent analysis of old experimental work indicates also that the Curie-Weiss law for the susceptibility must be replaced by a minus 4/3 power law. Both of these experimental results are in very good agreement with the predictions of the series summation method for the Heisenberg ferromagnet. Other discussions on magnetism were by Werner Wolf (Yale University) on the critical properties of a magnetic system which closely resembles the Ising model; Dale Teaney (IBM) on the specific heat of ferro- and antiferromagnets, and Peter Heller (Brandeis University) on the line widths of the nuclear magnetic resonances in ferro- and antiferromagnets.

A question which came up from time to time was whether the logarithmic singularity in the specific heat at constant volume for the \( \lambda \)-point of helium is a universal feature of all phase transitions. The interest of this question was enhanced by the experiments of A. V. Voronel (University of Kharkov) on the specific heat at constant volume of oxygen and neon, and of M. E. Moldover and W. A. Little (Stanford University) on helium, near their critical points. Both experiments indicated that the specific heat of oxygen, neon, and helium can be fitted very well by a logarithmic curve. W. Fairbank reviewed data on the helium \( \lambda \)-point, and Moldover presented results on the
The critical point of helium. The question of how far the specific heats of magnetic transitions can be represented by the logarithmic form was discussed by T. Yamamoto (Kyoto University). The discussions indicated that, although the specific heat of several gases and many magnetic systems can be represented by the same logarithmic function which represents the specific heat near the λ-point of liquid helium over several decades of T-Tc, in none of these transitions was the logarithmic singularity confirmed as unequivocally as for the helium λ-point. It was pointed out by Fisher that the experiments of Voronel et al. and Moldover and Little could be represented by a small positive power of |T-Tc|. This would be in agreement with the results of the series summation methods and with the conclusions drawn from the inequalities derived by Rushbrooke and Griffiths. Following discussions by M. H. Edwards (Stanford University) on the coexistence curve of liquid helium, and by H. Kierstead (Argonne National Laboratory) on a logarithmic anomaly, the pressure coefficient, in another property of helium close to the λ-line, M. J. Buckingham presented his theory on the nature of cooperative transition. This theory proceeds in quite a different direction from others.

The quantity of light scattered in a given direction at a given wavelength by the fluctuations of an opalescent medium is related by a very simple Fourier transformation to the pair correlation function of the fluctuations. The intensity of inelastically scattered light, which depends on both the frequency and the wave vector, is related by a somewhat more general Fourier transform formula to the temporal sequence of the density fluctuations. In the absence of Elliott Montroll (Institute for Defense Analyses), who was to have discussed the theoretical provenance of this relationship as well as of its limitations, Debye (Cornell University) commented on this topic. He warned that the very convenient Fourier transform formulas are based on the Born approximation theory of scattering. In a region of large fluctuation, one must be concerned with nonlinear effects not given by the Born approximation. With this caveat in mind, Michael Fisher (King's College, London) reviewed the statistical mechanical theory of the pair correlation function, Fisher pointed out that the essential assumption of the Ornstein-Zernike theory applies.

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is that the "direct correlation function" is short-range even at the critical point. This seemingly innocuous assumption immediately leads to the conclusion that the correlation function itself is long-range and behaves like $1/R$ for large distances. The fact that light scattering experiments are in very good agreement with the Ornstein-Zernike theory, except very close to the critical point, indicates that this is quite a good assumption. Several authors, however, have suggested that the direct correlation function is probably not short-range at the critical point, and in fact this assumption is inconsistent with the rigorous pair correlation function derived by Onsager for the two-dimensional Ising model. Fisher's own investigation with the series summation method suggests that the pair correlation function decays like $1/R$ to a power slightly less than 1.

The present experimental status of light and x-ray scattering from critically opalescent systems was discussed in a review by H. Brumberger (Syracuse University). Critical scattering has often been studied, but only a few of the most recent experiments have been done carefully enough to test the Ornstein-Zernike theory. B. Chu (University of Kansas) briefly reviewed his careful experiments on the scattering of light from a number of binary liquid mixtures. These experiments beautifully confirmed earlier results of McIntyre and others that large and significant deviations from the Ornstein-Zernike theory become manifest for temperatures of the order of hundredths of a degree from the critical point.

One of the most interesting questions before the conference was the apparent contradiction between the experimental results of L. Passel (Brooklyn) and B. Jacrot (Saclay) on critical magnetic scattering of neutrons from iron and the theory of Van Hove. Both experimenters observed a finite inelasticity of the scattering even at the critical point, while the theory of Van Hove, just as unequivocally, showed that the scattering must be inelastic at the critical point. Marshall resolved this contradiction by postulating the persistence of spin waves, much altered by dissipative effects, even up to the critical point. After Passel commented on the work by Marshall and by Als-Nielson and Dietrich of RISO, Denmark, on elastic neutron scattering from $\beta$-brass, the interesting question of the inelastic scattering of light from criti-
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This will be the first complete atlas of the early development stages of the bony fishes of the Chesapeake Bay area. The National Science Foundation awarded a grant to Mrs. Alice J. Mansueti to complete the project started by her husband, the late Dr. Romeo J. Mansueti, for the Chesapeake Biological Laboratory of the University of Maryland.

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... cally opalescent systems was raised. The observation of this effect has only recently become possible because of the existence of lasers. Two groups of investigators have recently succeeded in observing this effect. The effect was first observed by Alpert and Yeh (Columbia University) in a critically opalescent mixture of cyclohexane and aniline, and shortly after by Ford and Benedek (M.I.T.). There is much uncertainty in the experimental results on equilibrium critical phenomena and there is even more in the observation of non-equilibrium critical phenomena. J. Sengers (National Bureau of Standards) reviewed experimental work on transport properties of liquids, gases, and liquid mixtures near critical points. Perhaps the most surprising conclusion was the fact that viscosity exhibits no observable anomaly near the critical point of gases, whereas thermal conductivity exhibits a very large and possibly infinite value near the critical point. The reasons for this were the subject of an interesting but inconclusive discussion following Sengers' talk. After a short presentation on nuclear magnetic resonance experiments near the critical point of ethane by M. Bloom (Harvard University and the University of British Columbia) the question of ultrasonic propagation in the neighborhood of critical points was raised. C. E. Chase (M.I.T.) discussed the ultrasonic investigation of helium near its critical points, and C. Garland (M.I.T.) spoke on the ultrasonic investigation of ammonium chloride near its order-disorder transition.

The rather concentrated work of the conference was interrupted by an evening of socializing and relaxation at a banquet. Philip H. Abelson (editor of Science and director of the Carnegie Institution Geophysical Laboratory) spoke on the role of group interaction in scientific research.

The emphasis of the conference was mainly on experiment, reflecting the present situation in the field. The significance of much experimental data is being sorted out. The older theories give the broad outlines of the phenomena but are incapable of explaining the delicate behavior in the immediate neighborhood of the critical point.

The conference proceedings will appear in the National Bureau of Standards Miscellaneous Publications series and will be available through the Government Printing Office. Inquiries about the proceedings should be directed to the undersigned.
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<td>500mg.</td>
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<td>98 dyne/cm</td>
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<tr>
<td>Tared Capacity</td>
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<td>One Scale Div.</td>
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<td>0.1mg.</td>
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<td>.392 dyne/cm</td>
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<td>0.2mg.</td>
<td>.005mg.</td>
<td>0.05mg.</td>
<td>.04 dyne/cm</td>
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<tr>
<td>Accuracy</td>
<td>1 mg.</td>
<td>.01mg.</td>
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<td>.10 dyne/cm</td>
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Forthcoming Events

October

15–17. Growth, intermountain regional conf., Alta, Utah. (E. W. Hanly, Dept. of Molecular and Genetic Biology, Univ. of Utah, Salt Lake City)

16–17. Infectious Diseases Soc. of America, Washington, D.C. (E. H. Kass, IDS, Boston City Hospital, Boston, Mass.)


18–19. Systems Science, conf., Case Inst. of Technology, Cleveland, Ohio. (Inst. of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 10021)


18–20. Canadian Inst. of Mining and Metallurgy, annual western meeting, Winnipeg, Canada. (CIMM, 906 Drummond Bldg., 1117 St. Catherine St. W., Montreal 2, P.Q., Canada)


18–21. Advances in Gas Chromatography, 3rd intern. symp., Houston, Tex. (A. Zlatkis, Dept. of Chemistry, Univ. of Houston, Houston)

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18–22. American Soc. of Civil Engineers, Kansas City, Mo. (W. H. Wisely, ASCE, 345 E. 47 St., New York 10017)


18–22. American Public Health Assoc., 93rd annual, Chicago, III. (APHA, 1790 Broadway, New York, N.Y.)


18–22. Application of Radioisotopes in Gastroenterology, symp., Lausanne, Switzerland. (A. Vannotti, Clinique Médicale Universitaire, Hôpital Cantonal, Lausanne)

18–22. American College of Surgeons, annual clinical congr., Atlantic City, N.J. (American College of Surgeons, 55 East Erie St., Chicago, III. 60611)


19–21. Airborne Infection, 2nd intern. symp., Johns Hopkins Sch of Medicine, Baltimore, Md. (E. K. Wolfe, Fort Detrick, Frederick, Md. 21701)


21. New Mexico Acad. of Science, Albuquerque. (K. S. Bergstresser, 739 42nd St., Los Alamos, N.M.)


21–22. Copolymer conf., Ludwigshafen, Germany. (Deutsche Bunsen-Gesellschaft

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Coulomb Excitation

By Lawrence C. Biedenharn, Duke University, and Pieter J. Brussard, University of Utrecht. This comprehensive account of the development of nuclear Coulomb excitation since its inception in 1953 is the first detailed treatment of the subject since the classic review of Alder, Bohr, Huus, Mottelson and Winther in 1956. The relation of Coulomb excitation to nuclear structure physics is emphasized and the development of the Bohr-Mottelson unified model of the nucleus is discussed. Symmetry principles are used extensively, and newer techniques of multiple Coulomb excitation, triple correlation, gamma ray processes and polarization are explored in depth. 69 figures. $6.40

Nuclear Interactions of the Hyperons

By Richard H. Dalitz, University of Chicago. The author reviews experimental data on hypernuclei and explains how a simple phenomenological analysis of the data on binding energies can give valuable information about the lambda-N interaction. He discusses the spin dependence of the interaction and describes in detail the hyperon-nucleon potential arising from the exchange of pions and K-mesons. Decay modes of the light hypernuclei and other topics are also dealt with. (Tata Institute) $5.05

Electric and Magnetic Susceptibilities

By J. H. Van Vleck, Harvard University. This work, first published in 1932, is now again available in a paper edition. The book begins with a review of classical theory and goes on to its main subject, magnetic and electric susceptibilities, with application to paramagnetic gases and to salts of the rare earth and iron groups. $3.40

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27–29. Aerospace and Navigational Electronics, 12th East Coast conf., Baltimore, Md. (B. W. Moss, Mail #383, Martin Co., Box 988, Baltimore 21203)

27–29. American Ceramic Soc., Electronics Div., fall meeting, Los Angeles, Calif. (R. S. Shelden, 4055 N. High St., Columbus 4, Ohio)


28–4. Psychology as a Theoretical and Applied Discipline, seminar, Gujarat Univ., Ahmedabad, India. (P. H. Prabhu, School of Psychology, Education, and Philosophy, Gujarat Univ., Ahmedabad 9)


31–4. American Soc. of Agronomy, 57th
November

1–3. Systems, intern. meeting, Chicago, Ill. (R. L. Irwin, Systems and Procedures Assc., 7890 Brookside Dr., Cleveland, Ohio 44138)
1–4. American Soc. of Agronomy, Columbus, Ohio. (M. Stelly, ASA, 677 S. Segoe Rd., Madison, Wis. 53711)
1–4. Radioactive Pharmaceuticals, symp., Gatlinburg, Tenn. (Chairman's Office, Medical Div., Oak Ridge Inst. of Nuclear Studies, Oak Ridge, Tenn. 37831)
1–5. American Dietetic Assc., 48th annual, Cleveland, Ohio. (ADA, 620 North Michigan Ave., Chicago, Ill. 60611)

The following meetings will be held under the U.S.-Japan Cooperative Science Program for November. Information is available from N. P. Neureiter, Office of International Activities, National Science Foundation, Washington, D.C.
15–18. Bulk Sampling, seminar, Tokyo, Japan.
2–5. Use of the Baboon as an Experimental Animal, 2nd intern. symp., San Antonio, Tex. (L. R. Smith, Southwest Foundation for Research and Education, P.O. Box 2296, San Antonio 78206)
3–4. Automation, conf., Oslo, Norway. (Studiedelsmapet, Forkninsveien, Oslo 3)
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3-5. Data Processing, intern. fall conf., Dallas, Tex. (Conference Registrar, P.O. Box 2665, Dallas 75221)


3-5. Society of Engineering Science, 3rd technical, Univ. of California, Davis. (A. C. Eringen, School of Aeronautics, Astronautics and Engineering Sciences, Purdue Univ., Lafayette, Ind. 47907)

3-5. American Soc. of Tropical Medicine and Hygiene, New Orleans, La. (G. M. Jeffrey, P.O. Box 295, Kensington, Md. 20795)

3-6. Acoustical Soc. of America, St. Louis, Mo. (W. Waterfall, American Inst. of Physics, 335 E. 45 St., New York 10017)


4-5. Rheumatology, Czechoslovak-Polish meeting, Prague, Czechoslovakia. (F. Lenochn, Na Slupi 4, Prague 2)

4-6. American Soc. of Cytology, 13th annual scientific, New York, N.Y. (W. R. Lang, 1012 Walnut St., Philadelphia, Pa. 19107)


4-6. Geological Soc. of America, Kansas City, Mo. (R. C. Becker, GSA, 231 E. 46 St., New York 10017)

4-6. National Assoc. of Geology Teachers, Kansas City, Mo. (M. B. Rosalsky, Dept. of Geology, City College of New York, New York 10031)

4-6. Southwestern Medical Assoc., 47th annual, El Paso, Tex. (S. Heinemann, 310 N. Stanton, El Paso)

4-6. Paleontological Soc., Kansas City, Mo. (R. L. Langenheim, Jr., Dept. of Geology, Univ. of Illinois, Urbana)

5-6. Cancer of the Gastrointestinal Tract, 10th annual clinical conf., Univ. of Texas M. D. Anderson Hospital and Tumor Clinic, Houston. (R. L. Clark, M. D. Anderson Hospital and Tumor Inst., Univ. of Texas, Houston 25)


6-7. International College of Dentists, Las Vegas, Nev. (H. O. Westerdahl, 4829
Minnetonka Blvd., Minneapolis, Minn. 55416.

- 8-10. International Federation of Thermalism and Climatism, Israel. (A. Schirmacher, Fédération Intern. du Thermalisme et du Climatisme, Stadtbachstr. 12, Baden, Switzerland)

7. American College of Dentists, Las Vegas, Nev. (O. W. Brandhorst, 4226 Lindell Blvd., St. Louis, Mo.)

7-9. American Science Film Assoc., annual, Washington, D.C. (ASFA, 1319 F St., NW, Washington 20004)


7-11. American Soc. of Mechanical Engineers, winter annual mtg., Chicago, Ill. (ASME, 345 East 47 St., New York 10017)

7-12. Anatomical Pathology, 5th Latin American congr., Lima, Peru. (J. J. Andujar, P.O. Box 118, Fort Worth, Tex.)

7-13. Paediatrics, 11th intern. congr., Tokyo, Japan. (K. Nakamura, Dept. of Pediatrics, Univ. of Tokyo, P.O. Box 18, Hongo, Tokyo)

7-14. Vienna Univ. of Technology, 150th anniversary celebration, Vienna, Austria. (Technische Hochschule, Gusshausstr. 23, Vienna 4)


8-10. American Dental Assoc., Las Vegas, Nev. (H. Hillenbrand, 222 E. Superior St., Chicago, Ill. 60611)

8-11. Insecticide and Fungicide, 3rd British conf., Brighton, England. (Secretary, 140 Bensham Lane, Thornton Heath, Surrey, England)


8-11. Quality Control, intern. congr., Tokyo, Japan. (Union of Japanese Scientists and Engineers, c/o Sakata Bldg., 3 Muromachi 4-chome, Nihombashi, Chuoku, Tokyo)

8-13. Austrian Medical congr., 19th annual, Vienna. (M. Schnardt, Österreichische Arztekammer, Referat für Arztliche Fortbildung, Weihburgasse 10–12, Vienna 1)


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11–12. Kentucky Acad. of Science, Univ. of Kentucky, Lexington. (D. M. Lindsey, Georgetown College, Georgetown, Ky.)


11–13, Bases for Nuclear Spin-Parity Assignments, conf., Guelphburg, Tenn. (J. K. McGowan, Oak Ridge Natl. Laboratory, P.O. Box X, Oak Ridge, Tenn. 37831)


12–13. Society for Industrial and Applied Mathematics, western regional, Seattle, Wash. (B. H. Colvin, Boeing Scientific Research Laboratories, P.O. Box 3981, Seattle)


12–15. Neutrality of Medicine, 2nd intern. conf., Paris, France. (R. Ellenboger, Ministère des Anciens Combattants et Victimes de Guerre, 37, rue de Bellechasse, Paris 7)

14–15, National Medical Foundation for Eye Care, Chicago, Ill. (L. A. Zupan, Room 6, 1100 17th St., NW, Washington, D.C.)


14–18. Mexican Dental Assoc., 1st intern. congr., Mexico City. (R. Espinosa de la Sierra, Asociación Dental Mexicana, Sinaloa no. 9, Mexico 7, D.F.)


14–19. American Acad. of Ophthalmology and Otalaryngology, Chicago, Ill. (W. L. Benedict, 15 Second St., SW, Roches ter, Minn.)


15–16. Science conf., 4th annual, Belfer Graduate School of Science, Yeshiva Univ., New York, N.Y. (A. Gelbart, Bel-
fer Graduate School of Science, Amsterdam Ave. and 186th St., New York 10033)
15-19. Gulf and Caribbean Fisheries Inst., 18th annual session, Miami, Fla. (Executive Secretary, 1 Rickenbacker Causeway, Miami 33149)
15-19. World Federation for Mental Health, 18th annual, Bangkok, Thailand. (F. Cloutier, 1, rue Gevray, Geneva, Switzerland)
17-19. Micrography, intern. congr., Tokyo, Japan. (Mrs. J. Lang, 2501 Hudson Rd., St. Paul, Minn. 55119)
17-20. Canadian Cardiovascular Soc., Winnipeg, Man. (J. B. Armstrong, 1130 Bay St., Toronto 5, Ont.)

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18-24. Tropical Oceanography, intern. conf., Miami Beach, Fla. (F. F. Koczy, Inst. of Marine Science, Univ. of Miami, Miami 33149)
20-21. American Folklore Soc., Denver, Colo. (T. P. Coffin, Box 5, Bennett Hall, Univ. of Pennsylvania, Philadelphia 19104)
25. Central Assoc. of Science and Mathematics Teachers, Chicago, Ill. (A. M. Hach, 1220 Wells St., Ann Arbor, Mich.)
26-27. American Inst. of Ultrasonics in Medicine, 1st Pan American meeting, Lima, Peru. (C. Bustamante Ruiz, Dept. of Physical Medicine and Rehabilitation, Hospital Obrero, Lima)
28-3. Radiological Soc. of North America, Chicago, Ill. (M. D. Frazer, 713 Genesee St., Syracuse, N.Y.)
28-4. Odontological Federation of Central America and Panama, San Jose, Costa Rica. (R. Pauly S., Univ. of Costa Rica, San Jose)
28-4. Odontological Soc. of Chile, 5th intern. congr., Santiago. (J. Pequeño, San Antonio 510, Santiago)
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<th>SENSITIVITY</th>
<th>RISE TIME</th>
<th>IMPEDANCE ACCURACY</th>
</tr>
</thead>
<tbody>
<tr>
<td>D.C. to 50 KC</td>
<td>Oscilloscope 50 MV to 50V/CM</td>
<td>Less than 7 μsec.</td>
<td>Oscilloscope 1 Meg—Single End</td>
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<tr>
<td></td>
<td>Bio-amplifier in 10μV/CM to 100 MV/CM</td>
<td></td>
<td>Bio-amplifier ±5%</td>
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<thead>
<tr>
<th>TIME BASE</th>
<th>CRT</th>
<th>STIMULATOR</th>
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<tr>
<td>SPEED 10 μsec. to 1 sec/cm</td>
<td>TRIGGERING DIA. PHOSPHER</td>
<td>Amplitude .04 to 100 volt frequency 1 to 1000 cps</td>
<td>DIM. &amp; WT. 16&quot;x18&quot;x12&quot; 45 lbs.</td>
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<td>P7 (Filters available)</td>
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NEW BOOKS
(Continued from page 204)


content of plant parts” by J. Brunsma; “Determination of extractable substances in food packaging materials” by E. A. Garlock and O. E. Paynter; “DDT as a decompostion product of DDT” by D. E. Ott and F. A. Gunther; “Residue analytical limit of detectability” by G. L. Sutherland; and “Herbicides: A compilation of their physical, chemical, and biological properties” by G. W. Bailey and J. L. White.


Miscellaneous Publications

(Inquiries concerning these publications should be addressed to the publisher or agency sponsoring the publication, not to Science.)


Genetics
Second Edition
By ROBERT C. KING, Northwestern University
The Third Edition of this noted introductory textbook takes into account the sweeping new advances in genetics, incorporating recent research on such topics as human cytogenetics, the mechanism of gene action, DNA, the Lyon hypothesis, and the genetics of mimicry. Thirty illustrations have been added: the number of study questions has been increased to 216, and all answers are included in the text.
1965. 468 pp. 159 illus. $8.50

Inorganic Chemistry
By C. S. G. PHILLIPS and R. J. P. WILLIAMS, both of Oxford University
This comprehensive, up-to-date work is designed for use as a textbook in advanced courses and as a reference for research. The two volumes of the study may be used in sequence or independently; each book is separately indexed. Volume I contains Part 1, general principles, and Part 2, the chemistry of the non-metals. Volume II presents Part 3, the chemistry of the metals. Experiments and problems included.
Volume II, Spring 1966. approx. 630 pp. prob. $8.00

Vertebrates
Their Structure and Life
By W. B. YAPP, University of Birmingham
The first seven chapters of this introductory textbook in comparative anatomy are devoted to the vertebrate classes; organ systems are analyzed and compared in the last fourteen chapters. The book includes 192 line drawings; eight color plates that are large, clear, and well labelled; a glossary; and a classification table.
1965. 544 pp.; 200 illus. $8.50

The Mystery of Matter
Edited by THE AMERICAN FOUNDATION FOR CONTINUING EDUCATION
A valuable collection of writings by eminent scientists and authors, this book traces the development of the concepts of atomic physics and structure of living matter for students in introductory science courses. The topics take the form of such questions as “What is the Secret of Atomic Energy?” and “What is the Origin of Living Matter?” While major emphasis is reserved for modern scientific literature, the book also draws upon key works in the history of science, and in social sciences, literature, and philosophy as well.
1965. 728 pp.; 117 line drawings; 51 half-tones. text ed. $7.50

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slogan is, more or less, "a trout in every river," but the industries and municipalities which pay the bills for treatment plants tend to see water use as an either-or proposition—"pickerels or payrolls is their dogma," one observer remarked last week.

Critics also fear that the competition among states for industry would give commercial advantage to the states with the lowest standards, and that the Secretary of HEW will be hard put to resist political pressures arising from cries of lost jobs or bankruptcy if industries move elsewhere. It has been argued that shifting the burden for the first formulation of standards to the states will give them a chance to define the terms of discussion in a way that will be detrimental to conservation interests. "When we call an enforcement conference now," one HEW official said last week, "we go on the basis of a technical report which names names, tells the facts, and makes recommendations. If the states define the standards, the basis for discussion will be much weaker—and it's going to be hard to revise it upward." In this view, the reason for HEW's poor record in water pollution is not absence of authority to intervene but absence of inclination—which presumably will be remedied by the new administration.

Fears have also been expressed that the legislation will prove difficult to administer. For the most part neither the designers of the bill nor the officials who will administer it are yet able to answer questions concerning, for example, how a new industry entering a river system will be integrated into the system without lowering the standards. A redistribution of pollution allowances among all users of the stream would be one alternative—but one which might prove costly by encouraging piecemeal expenditures. An absolute prohibition on pollution for the newcomer is another—but one which would plainly discourage industrial expansion. Political dispensations—and the collapse of standards—is a third. Vagueness about such key questions is one reason for apprehension not only among the conservationists but also among industrial lobbyists.

Most such complaints are dismissed by supporters of the standards as intellectual fantasies. "What this bill says to polluters," one leading congressional conservationist said last week, "is that

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**NEWS AND COMMENT**

(Continued from page 199)

Proceedings of a Symposium held at the Armed Forces Institute of Pathology March 30-April 3, 1964, Sponsored jointly by the Intersociety Committee for Research Potential in Pathology, Inc., aided by a grant from the National Institutes of Health and the Armed Forces Institute of Pathology with a contract from the United States Army Medical Research and Development Command. These Proceedings appeared as a special supplement to the journal *Laboratory Investigation*, June, 1965.


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you have two more years of hanky-panky and after that we'll really be in business." The basis for this view is that, whereas now enforcement begins at the conference table and follows a lengthy route to hearings and court action, the new and elaborate standards-setting procedure itself encompasses those delays. Once the standards are set, the government can presumably move right on to enforcement action against violators. As for the seeming interlocking of federal and state authority, another veteran congressional conservationist advises, "don't be fooled. Federal enforcement officials have had a lot of experience structuring conferences and they'll be able to handle this to suit them." Congressman Blatnik also believes that, despite the emphasis on cooperation with states, "there is no doubt that in the last analysis real authority rests with the federal government." Political pressures on government officials these lobby-hardened politicians take as a matter of course. Details of administration, they believe, will work themselves out. And they feel, above all, that, by extending the basis for federal intervention to situations where there is no pretense that the immediate public health or welfare is threatened, they have constructed a system in which broader values are recognized and in which the upgrading of long-polluted rivers can begin.

Other Features

Besides the provision for a new agency and water standards, the new legislation contains several other measures designed to put water-pollution control on a stronger footing. One of the most important, though little noticed, features of the bill gives the new agency power to bring enforcement action if it finds that substantial economic injury results from the inability to market shellfish or shellfish products because of pollution in interstate or navigable waters. The inclusion of "navigable" waters gives the agency access to the large number of coastal bays and harbors which have no interstate boundaries and which therefore will be omitted from classification under the standards provision. The bill also authorizes a 4-year, $20 million program of grants to states, municipalities, and other agencies for research and development on ways of improving the combined storm and sewage systems which are extremely common throughout the country and which fre-
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Arches of Science Award to Weaver

The Pacific Science Center Foundation this week named Warren Weaver to receive its first Arches of Science Award on 25 October in Seattle. The award, created earlier in the year to recognize outstanding contributions by people in all professions to better public understanding of science, carries a $25,000 prize and a gold medal.

Although Weaver retired last year as vice president of the Alfred P. Sloan Foundation in New York, he has continued as a special consultant and a trustee of the foundation. He is also chairman of the board of the Salk Institute for Biological Studies in San Diego. A fellow of AAAS since 1928, he was the 1954 president of the AAAS. Next week, in Paris, he will receive the Kalinga prize, awarded annually by UNESCO for distinguished contributions to public understanding of science.

Wheeler Receives Einstein Award

John Wheeler, professor of physics at Princeton, is the recipient of this year's Einstein Award. The award, which provides $5000, a gold medal, and a citation, is presented by the Lewis and Rosa Strauss Memorial Foundation.

Established in 1950, the award is made in recognition of significant additions to human knowledge in the natural sciences.

During World War II Wheeler was a consultant and senior physicist at atomic energy projects, first at Princeton, later at Chicago, Richland, and Los Alamos. He was a vice president of the Battelle Memorial Institute in Columbus, Ohio, where he is now a trustee. He is a member of the advisory committee at Oak Ridge National Laboratory.

Announcements

NASA last week stopped telemetry operations of the Mariner IV spacecraft. The craft had operated since November 1964, transmitting scientific and engineering measurements on the environment of interplanetary space. In July it recorded the first close-up pictures of Mars. Project officials at Caltech's Jet Propulsion Laboratory said that the craft will continue in its present orbit around the sun; tracking it will be possible only with a new 210-foot antenna, which will begin

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operation next spring at the Goldstone Space Communications Station in California. The spacecraft will continue transmitting signals; it may resume its radio link with Earth in September 1967, when it will be at its closest approach to this planet, some 29 million miles away. At that time, according to JPL engineers, several months of useful telemetry may be obtained if the transmitter and other critical systems are still operating.

The National Library of Medicine has introduced a new service for the biomedical public, consisting of a monthly listing of selected demand-search bibliographies, orginally compiled by the library at the request of individual researchers. The bibliographies are in subject areas which the library feels may be of interest to a broader audience. Listings will include the topic of the searches and the number of citations; individuals may write for copies of the particular bibliographies in which they are interested. Additional information is available from the National Library of Medicine 8600 Rockville Pike, Bethesda, Maryland 20014.

The University of Bridgeport, Connecticut, has established a graduate division in its college of arts and science. Graduate courses leading to the master's degree will include biology, chemistry, mathematics, physics, political science, and sociology. Initially, courses will be offered on a part-time basis, most meeting once a week. The college plans to seek formal approval of the program from the Connecticut State Board of Education during the 1966-67 academic year, and to confer the first master's degrees not later than June 1968. Applications for the graduate division are being accepted by William Walker, director of the College of Arts and Science Graduate Admissions Office, Bridgeport.

An Office of Biochemical Nomenclature has been established by the National Academy of Sciences—National Research Council. The office will seek to coordinate information on activities of national and international organizations in biochemical nomenclature, to stimulate new activities in the field, and to encourage dissemination of information to interested groups. Waldo E. Cohn, of the biology division at Oak Ridge National Laboratory, is director of the office. He also is secretary of the Joint Commission on the Nomenclature of Biological Chemistry of the International Unions of Pure and Applied Chemistry and of Biochemistry.

An Advisory Committee on Emergency Planning has been established by the National Academy of Sciences, under an agreement with the Office of Emergency Planning in the Executive Office of the President. It will assist OEP in planning and coordination of federal activities in times of national emergency. The committee will be concerned with such problems as long-range requirements for stockpiling of strategic and critical materials, recovery and construction after a nuclear attack, and the impact of new developments in science and technology on the emergency planning effort. Carl F. Prutton, of Food Machinery and Chemical Corporation, is chairman of the committee; vice chairman is Philip Arnold, of Phillips Petroleum Company. The other members include: Clay P. Bedford, Henry Kaiser Company, Oakland.

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firm of consulting engineers in New York.


Thomas L. Martin, Jr., University of Florida.


Lauriston S. Taylor, special assistant to the president of the NAS, is executive director of the committee.

An academic committee offering a graduate degree program in the information sciences has been formed at the University of Chicago. The committee on information sciences will accept its first masters and doctoral students this fall. Richard H. Miller, associate professor of astronomy and director of the University's Institute for Computer Research, is acting chairman. He points out that the creation of the committee reflects the emergence of "an important new body of knowledge which does not fit into traditional university departments." Its purpose is to provide a multidisciplinary academic base for research and training in the field. Students entering the program will need a background in advanced calculus, linear algebra, numerical methods, and probability statistics.

George Washington University is offering a program in law, science, and technology in its graduate school of public law. The program's aim is to help train lawyers to deal more effectively in the areas of reciprocal relationships between law and science. It treats social, economic, legal, and political sciences. The program offers courses leading to the master-of-laws degree in law, science, and technology. A limited number of research assistantships are available for law and social-science graduates. Courses and conferences are also offered on a noncredit basis for members of the bar. Additional information may be obtained from the dean, Graduate School of Public Law, George Washington University, Washington, D.C. 20006.

Brown University has incorporated its departments of biology and botany and the division of medical science into a Division of Biological and Medical Sciences. Administration will be chiefly by an executive council, chaired by Paul F. Fenton, of the former
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An Institute of Philosophy and Politics of Education was formed recently at Teachers College, Columbia University. The institute will sponsor research and publications on the purposes and politics of American education. Its first project, supported by a $196,000 grant from the Carnegie Corporation of New York, will be an interpretive history of American education, prepared by Lawrence R. Cremin, Barnard professor of education at the college and the institute's executive officer.

Grants, Fellowships, and Awards

The Technical University of Karlsruhe, West Germany, is planning a postgraduate course in chemical engineering and physical chemistry, from 2 May 1966 to 15 July 1967. The program, sponsored by UNESCO, is open to persons under 40, preferably from developing countries; candidates should have at least a master's degree and should be active in teaching or research in their home country. Preference will be given to persons with previous research experience in foreign countries. German-language training will be given at the Goethe Institute, then course and research work at Karlsruhe and Frankfurt. Participants will receive fellowships to cover economy-class travel; tuition and fees; room, board, and a small allowance at the Goethe Institute; and a monthly stipend of DM 700 (about $175 U.S.) during study at Karlsruhe and Frankfurt. Applications may be obtained from UNESCO, the various countries' embassies in Germany, or the Technical University at Karlsruhe. Deadline for receipt of completed applications: 15 November. (Internationales Seminar, 75 Karlsruhe, Karlstrasse 42-44, Germany)

The University of Colorado medical school is accepting entries in the Jane Nugent Cochems competition. A prize of $2500 will be presented for the best paper on "thrombophlebitis and basic vascular problems." The vascular problems under consideration should be concerned with the underlying mechanisms or processes of vas-

New and Forthcoming Books from Prentice-Hall

POPULATION, ENVIRONMENT, AND EVOLUTION
by G. Ledyard Stebbins, University of California at Davis. This new book presents the undergraduate student in general biology with an account of the basic processes of organic evolution as they have been analyzed and clarified during the past forty years. It is the first text at this level to attempt the application of genetic principles to the evolution of major groups of organisms. Contents include: The Synthetic Theory of Evolution and Its Development; The Sources of Variability; The Organization of Genetic Variability in Populations; The Differentiation of Populations; Reproductive Isolation and the Origin of Species; The Role of Hybridization in Evolution; Major Trends of Evolution; and the Processes of Evolution in Man. (In the CONCEPTS OF MODERN BIOLOGY SERIES edited by William D. McElroy and Carl P. Swanson) Jan. 1966, approx. 208 pp., paper $2.50

INTRODUCTION TO MASS SPECTROMETRY AND ITS APPLICATIONS
by Robert W. Kiser, Kansas State University. This is the first student and course-oriented text of its kind specifically designed for teaching purposes and self-study. The important theoretical principles of various types of mass spectrometers and their operation, and the applications of the mass spectrometer to various problems are considered, with numerous examples to illustrate both theory and experiment. 1965, 368 pp., $10.50

BEYOND THE EDGE OF CERTAINTY: ESSAYS IN CONTEMPORARY SCIENCE AND PHILOSOPHY
edited by Robert G. Colodny, University of Pittsburgh. Offering an outstanding collection of essays by eight scientist-philosophers, this new volume represents the response of contemporary philosophy of science to both traditional and modern problems of the physical sciences. Each major subject is placed in its historical setting, showing the lineage of the "new" problems posed by quantum and relativistic mechanics. (Volume II in the University of Pittsburgh Series in the Philosophy of Science.) 1965, 287 pp., $8.75

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Englewood Cliffs, N.J.
cular disease, particularly those associated with thrombosis, but not necessarily restricted to it. There are no restrictions as to length or format, joint authorship, or use of pictures, charts, or figures; but papers may not be published until after the winner is announced early next year. Deadline for receipt of entries: 15 November. Information about eligibility may be obtained from J. J. Conger, School of Medicine, University of Colorado Medical Center, 4200 East Ninth Avenue, Denver 80220.

The Fund for Overseas Research Grants and Education, Inc. (FORGE) offers research grants to junior members of science faculties in Latin American universities. The grants are designed to help recently trained science and engineering faculty members to start projects that promise worthwhile results and effective teaching. Funds go directly to the researchers for supplies, equipment, and student assistants. Applicants may write to FORGE, describing their project, its importance, and the basic requirements; there are no deadlines or calendar dates for starting or completing the work. Applications are reviewed throughout the year by a panel of U.S. scientists who are familiar with science in Latin American institutions.

FORGE, established in 1963, is supported by private corporations and individuals. The amounts granted are usually small by U.S. standards, averaging about $2000; they are given on the assumption that small amounts of U.S. currency may be used with great advantage in institutions in developing countries. At the present time FORGE limits its operation to Latin America. Additional information is available from the executive director, FORGE, 60 East 42nd Street, New York 10017, Room 4310.

Publications

A 40-page brochure on "Coronary Care Units," issued by the PHS Heart Disease Control Program, describes specialized intensive care units for acute myocardial infarction patients. It is aimed toward hospital administrators and professionals concerned with hospital care of heart-attack patients. It covers full-time electronic monitoring, staffing patterns for medical and nursing personnel, and nurse training for work in the special units. The booklet

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The Atomic Energy Commission has published a booklet describing its organization and principal functions. The brochure includes descriptions of the AEC programs of production, research and development, and training, along with a brief explanation of the procedures for regulating the nongovernment uses of atomic energy to assure safety. It contains maps locating major AEC installations across the nation and the sites of power reactors. The booklet is nontechnical, designed for students, teachers, and the public. (The US AEC—What It Is, What It Does: 68 pages, no charge. Division of Technical Information Extension, Atomic Energy Commission, P.O. Box 62, Oak Ridge, Tenn.)

The National Association of Educational Broadcasters (NAEB) has released a study on the financing of educational television stations, by Educational Television Stations (ETS), a division of NAEB. The publication contains analyses of ETV station financing and a description of the meeting last December of ETV station representatives. Copies of the report, “The Financing of Educational Television Stations, Present Patterns and Recommendations for the Future,” are available for $2 from the ETS Division, NAEB, 1346 Connecticut Avenue, NW, Washington 20036.

The National Science Foundation has issued the results of its most recent annual survey of federal spending for scientific activities. Federal Funds for Research, Development, and Other Scientific Activities, Fiscal Years 1963, 1964, and 1965, volume 13, emphasizes obligations for research and development, with major stress on obligations for the related but separate activities of basic research, applied research and development. (Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. No. NSF 65-13. 244 pages; $1.25)

The Organization for Economic Cooperation (OECD) has published a summary of its first ministerial meeting on science, held in Paris, October 1963. The meeting, attended by ministers of
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science and technology of the member nations, "marked the first time that the implications of science and technology for the formulation of public policies were discussed at a high-level intergovernmental forum," according to Thor-Kil Kristensen, OECD secretary general. It covered national and international science policy and science and economic growth. (Ministers Talk about Science. McGraw-Hill Book Company, OECD Unit, 351 West 41st St., New York 10036. 178 pages; $2.50)

A brochure on radiation pyrometry is available free of charge from Milettron, Inc. The bulletin presents charts and equations showing types of errors to be anticipated in radiation measurements, and various tables, curves, and definitions pertinent to the field. It also includes the theory of pyrometry operation for total radiation, brightness, and two-color instruments. (Radiation Pyrometry, Technical Bulletin 31565, Milettron Inc., 454 Lincoln Highway East, Irwin, Pennsylvania 15642)

A report on the technical and economic status of magnesium-lithium alloys has been published by the National Aeronautics and Space Administration's technology utilization division. The 45-page booklet, prepared for NASA by the Battelle Memorial Institute, is based on research and development activity at NASA's R&D centers across the nation. It deals with current uses of the alloys and with their potential for adaptation to commerce and industry. (Technical and Economic Status of Magnesium-Lithium Alloys. Superintendent of Documents, U.S. Government Printing Office, Washington 20402. NASA SP-5029. 25 cents)

The Department of Health, Education, and Welfare has published a report on the numbers of graduate science students in selected U.S. institutions from 1959 to 1964. The book summarizes data from an annual survey by the Office of Education. (Five-Year Trend in Graduate Enrollment and Ph.D. Output in Scientific Fields at 100 Leading Institutions, 1959-60 to 1963-64. Superintendent of Documents, Government Printing Office, Washington 20402. $1)

The role of minerals in the world's economy is assessed in the latest in a series of Interior Department publications. Statistics are presented on more
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Monthly; devoted to methods of chemical analysis, physical investigation, and mechanical test.

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NASA has released its semiannual publication, "Opportunities for Participation in Space Flight Investigations." The 107-page book includes detailed descriptions and timetables covering a wide range of NASA flight projects, both manned and unmanned. The projects are described briefly, and details of the space that may be available for locating instrument packages are included. Flight dates cover the period between 1966 and 1972, and the deadlines for proposals vary according to each project. (Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. $5)

Scientists in the News


The new president of the Society of Women Engineers is Isabelle French, of Bell Telephone Laboratories, Allentown, Pennsylvania.

Elizabeth M. Rona, of the special training division at Oak Ridge Institute of Nuclear Studies, has been appointed a professor in the chemistry department and in the marine laboratory at the University of Miami.

The new president of the Forest History Society is Ralph W. Hidy, professor of business history at Harvard graduate school.

John T. Schlebecker, formerly at Iowa State University, Ames, has become curator of agriculture and forest products at the Smithsonian Institution.

William H. Danforth, associate professor of medicine at Washington University, has been appointed vice chancellor for medical affairs at the university.

Rupert E. Billingham, professor of zoology at the University of Pennsylvania, has been appointed chairman of
the newly created department of medical genetics at the university.

William Rea Keast has become president of Wayne State University, succeeding Clarence B. Hilberry. Keast was formerly vice president for academic affairs at Cornell.

George K. Davis, formerly director of the nuclear science program at the University of Florida, has been appointed director of the university's division of biological sciences.

Robert C. Wood, professor of political science at M.I.T., has been appointed head of the newly formed department of political science at the school.

Donald Crossan, associate professor of plant pathology at the University of Delaware, has been appointed assistant dean of the college of agricultural sciences and assistant director of the Delaware Agricultural Experiment Station.

Donald Harting has been named director of the National Institute of Child Health and Human Development. He had been acting director since last fall, when Robert A. Aldrich resigned to return to the University of Washington.

William R. Bennett, head of the data theory department, Bell Telephone Laboratories at Holmdel, New Jersey, has been appointed professor of electrical engineering at Columbia University.

William J. Youden, formerly a senior statistical consultant at the National Bureau of Standards, has been appointed professor of applied science at the George Washington University school of engineering and applied science.

The University of Chicago has named H. Stanley Bennett director of the new Laboratories for Cell Biology, effective 1 January. He will be succeeded as dean of the division of the biological sciences by Leon O. Jacobson, who is now chairman of the department of medicine.

William J. Rutter, formerly professor of biochemistry at the University of Illinois, has been appointed professor of biochemistry and professor of genetics at the University of Washington.

Willard J. Jacobson, professor of natural sciences at Teachers College,
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Columbia University, has been appointed chairman of the department of science education at the college.

**Homer W. Schamp**, professor of physics at the University of Maryland and director of the university's Institute for Molecular Physics, has been appointed dean of faculty for the University of Maryland in Baltimore County. The new campus will open in the fall of 1966 for about 500 freshman students.

**George James** will become vice president of the Mount Sinai Medical Center and dean of the new Mount Sinai School of Medicine, as of 1 November; he will retire in October as New York City Commissioner of Health. The medical school plans to admit its first students in the fall of 1968.

**Miles D. McCarthy**, chairman of the division of science and mathematics and of the department of biological sciences at California State College, Fullerton, has been named dean of the college's school of letters, arts, and sciences. He will be on sabbatical leave during the fall semester for a tour of European science laboratories.

**Evil Gorham**, associate professor of botany at the University of Minnesota, has been appointed professor and head of the department of biology at the University of Alberta, Calgary, Canada.

Massachusetts Institute of Technology has appointed **Emily L. Wick** associate dean of student affairs, succeeding **Jacquelyn A. Mattfeld**, who will become dean of Sarah Lawrence College. Dr. Wick is an associate professor of food chemistry at M.I.T.

**S. Douglas Cornell**, formerly executive officer of the National Academy of Sciences–National Research Council, has been appointed president of Mackinac College, Michigan. The school is scheduled to open in September 1966.

**Roger G. S. Bidwell**, formerly associate professor of botany at the University of Toronto, has been appointed professor of biology at Western Reserve University.

**John A. Hutcheson**, recently retired vice president of the Westinghouse...
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Electric Corporation, Pittsburgh, has become chairman of the division of engineering and industrial research of the National Research Council.

The University of California, San Diego, has appointed Robert B. Livingston chairman of the department of neurosciences. He had been chief of the general research support branch in the NIH Division of Research Facilities and Resources.

Leon Katz, professor of physics and director of the linear electron accelerator laboratory at the University of Saskatchewan, has become head of the university's physics department.

The following have been appointed professors of mathematics at Case Institute of Technology:
- John R. Isbell, formerly at the University of Washington.
- Milton Lees, formerly associate professor at California Institute of Technology.
- A. J. Lohwater, formerly at Rice University.

The Federation of American Societies for Experimental Biology has appointed Joseph F. A. McManus executive officer. He had been a professor of pathology in the experimental program of medical education at Indiana University, Bloomington. He was a member of the FASEB Board from 1957 to 1964, and a member of the FASEB Advisory Committee from 1961 to 1964.

Wallace R. Brode, chairman of the AAAS Science Youth Activities Committee and a former AAAS president, has become foreign secretary of the American Chemical Society. He will head the International Activities office, a recently established unit in the Division of Membership Activities of ACS, with offices in Washington. He is retaining his position at AAAS.

John H. Law, formerly of Harvard, has been appointed professor in the biochemistry department of the University of Chicago.

Arthur B. Callahan, formerly biological sciences coordinator in the Office of Naval Research San Francisco branch, has become head of the medicine and dentistry branch of ONR, in Washington.

The University of Pennsylvania medical school has named Walter B. Shelley chairman of the dermatology department, succeeding Donald M. Pillsbury, who will remain at the school as a professor of dermatology.

**Recent Deaths**

Samuel A. Alexander, 73; clinical professor of medicine at Georgetown University; 22 September.

Samuel K. Allison, 64; director of the Fermi Institute for Nuclear Studies at the University of Chicago; while representing the U.S. Atomic Energy Commission at an international conference on thermonuclear programs, in England; 15 September.

Othmar H. Ammann, 86; designer of many of New York's bridges, most recently of the Verrazzano-Narrows Bridge; he was elected this year to the National Academy of Engineering; 22 September.

Alva Raymond Davis, 78; vice chancellor and former dean of the college of letters and science, University of California, Berkeley; 15 July.

John E. Flynn, 68; chief scientist in New York for the Office of Naval Research; 22 September.

Morris B. Jacobs, 59; professor of occupational medicine at Columbia; 12 July.

Dwight E. Minnich, 76; retired chairman of the zoology department at the University of Minnesota; 4 September.