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A new free pamphlet on personal monitoring films is available from Eastman Kodak Company, Special Sensitized Products Division, Rochester, N. Y. 14650. It contains a bibliography.

For background on the need for background on monitoring against background
Film-badge services rely on agreed "safe" levels of personal exposure. The arrangement permits the customer to treat the whole thing as routine. Is there any obligation to reopen the subject merely because a newer Kodak film happens to make it just as easy to detect a much smaller increment over natural background than was possible when the conveniently safe levels were chosen?

860
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SCIENCE, VOL. 146
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By adjusting the Tri-Carb Spectrometer to record the energetic portion of the Compton spectrum in one channel, sample counting efficiencies may be determined directly from curves such as those shown in Figures 1, 2 and 3. This method is entirely independent of the radioactivity of the samples, and good precision is obtained with only one-minute counts of the relatively high activity gamma standard regardless of the activity level of the sample.

Automatic External Standardization is standard on all 4000 Series Tri-Carb Spectrometers, and optional on most 3000 Series instruments. Furthermore, in line with Packard's policy of providing new features for existing instruments wherever possible, Automatic External Standardization is also available as a field modification for most 3000 Series Spectrometers.

CHANNELS RATIO—When sample activity is reasonably high and when quenching is not too severe, the Channels Ratio method may be used to determine counting efficiencies. This technique utilizes the radioactivity of the sample itself for determination of the degree of quenching. The change in spectral shape that results when colored or chemical quenching substances are present in a sample is measured by the change in ratio of the net counts in two channels of pulse height analysis selected to span certain portions of the spectrum. These ratios may be directly correlated with counting efficiencies of samples as shown by the curves in Figures 4 and 5.

Various models of 3000 and 4000 Series Tri-Carb Spectrometers provide calculators or true electronic digital computers programmed to present, in addition to total net counts and net count rate for each channel, all of the possible channel ratios.
ence, appears to qualify as a leader in one polar group in C. P. Snow's Two Cultures, the literary intellectuals. Certainly, Sartre has strongly influenced many writers on both sides of the Atlantic, but so have Darwin, Marx, and Freud and their followers. And just as the effect of science on philosophy has made it unlikely that the 20th century would produce another Hegel, with his grand and grandiose rationalist interpretation of reality, it may well be that Sartre represents a late flowering of what he calls the "bourgeois puritan individualism," which produced him and against which he rebelled.

—JOHN WALSH

Announcements

The Department of Commerce has announced the establishment of a scientist exchange program within the Department's technical bureaus. It is designed to afford staff scientists an opportunity to broaden their scientific, technical, and management abilities through 9-month assignments at different bureaus within the department. The scientists, in addition to working at new jobs, will be brought together for periods of study to include considerations of national and international issues involving science and technology.

Meeting Notes

Papers are being solicited for a seminar on Fatty Acids, scheduled 3–6 February at the Regional Research Laboratory, Hyderabad-9, India. It will be sponsored by the Council of Scientific and Industrial Research. Topics to be covered include recent advances in the field of fatty acids and their derivatives. Deadline for 5-page abstracts: 30 November. (G. Satyanarayana Rao, Council of Scientific and Industrial Research, Regional Research Laboratory, Hyderabad-9, India)

Grants, Fellowships, and Awards

Travel grants are available to help U.S. scientists attend the 23rd international congress of physiological sciences, scheduled next 1–9 September in Tokyo. The allotments will cover round trip charter or group jet fares. Preference will be given to younger scientists and persons presenting communications. Deadline for receipt of applications: 1 January. (USA National Committee, International Union of Physiological Sciences, Room 256, 2101 Constitution Avenue, NW, Washington 20418)

The Medical Research Council of Sweden is offering two postdoctoral fellowships for a year's training in biomedial sciences in Swedish research institutions beginning in the fall of 1965. The fellowships, made available through the National Institutes of Health, offer training in either a basic or clinical field related to health, as well as a choice of Swedish institutions. Stipends have been set at two levels equivalent to salaries paid Swedish associate professors (30,000 Swedish crowns: approx. $6,000) and assistant professors (25,000 Swedish crowns). U.S. citizens who have been engaged in research in the U.S. for at least two of the past four years may apply. Deadline for receipt of applications: 1 January. Information and forms are available from: Chief, Career Development Review Branch, Division of Research Grants, NIH, Bethesda, Md.

Applications are currently being accepted for two Turtox Scholarships for the 1965–66 academic year. The scholarships, established by General Biological Supply House, Inc., carry a stipend of $5000 each, and are open to any U.S. citizen who is, or has been, enrolled in a graduate school, and who plans to continue study for a Ph.D. in botany, zoology, or biology. Deadline for receipt of applications: 1 February. (Frank A. Brown, Jr., chairman of the awards committee, Department of Biological Sciences, Northwestern University, Evanston, Ill.)

The U.S. Atomic Energy Commission has announced the availability of graduate fellowships in nuclear science and engineering. First, intermediate, and terminal year fellowships, with stipends of $2400, $2600, and $2800, respectively, are being offered. They also carry an additional $500 for a wife and each dependent. Other payments include tuition and fees, as well as an allowance for travel to the fellowship school, and applicants may choose one of 68 participating universities. Application deadline: 15 January. (NSE Fellowship Office, University Relations Division, Oak Ridge Institute of Nuclear Studies, Oak Ridge, Tenn. 37831)

The Boris A. Bakhmeteff research fellowship in fluid mechanics is available through the Humanities Fund, Inc., New York. Applicants must be full-time graduate students, working toward a master's or doctor's degree. The fellowship stipend is $3600. The recipient may work at the institution of his choice, but may not hold any other fellowship. Deadline for receipt of application: 15 February. (W. Allan, School of Engineering and Architecture, City College of New York, New York 10031)

Publications

Boston University Observatory has announced the publication of a Catalog of Lunar Craters. The 106-page catalog is a digital map of 5 percent of the visible surface of the moon. Information listed for each crater in the catalog includes a sequence number, the crater name, the position coordinates, the diameter, a description of degree of definition and shape, special notes on physical structure, and the number of the photograph on which measurements were taken. The majority of craters listed in the catalog were positioned for the first time and are designated by number. Copies are available to space researchers. Applications for copies should be sent on institutional letterheads. (Catalog of Lunar Craters, Prof. G. S. Hawkins, Physics-Astronomy Department, Boston University, 700 Commonwealth Avenue, Boston, Massachusetts)

The AAAS has announced publication of a new Science Book List for Young Adults. The 268-page annotated catalog of 1376 selected science and mathematics books for reference and collateral reading by secondary school students and college undergraduates replaces a similar 1959 list. (The Science Book List for Young Adults, AAAS Publications, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005; $2.50 paperbound, $3.50 cloth)

The National Aeronautics and Space Administration has made available its recent publication, "Unmanned Spacecraft of the U.S." The 16-page booklet reviews the spacecraft which have been developed and flown, or are being developed in the U.S. by NASA: "scientific" satellites which are investigating the environment, and "application" sat-
ellites for weather observation and communications. Single copies are available free of charge. (Educational Publications Distributions Center, AFEE-1, NASA, Washington 25)

The U.S. Public Health Service has issued a revised version of Air Pollution Publications, a selected bibliography covering the years 1955–63. It includes publications by division of air pollution personnel and persons and organizations that have received federal air pollution control funds since July 1955. (Public Health Service publication No. 979, revised, U.S. Government Printing Office, Washington, D.C. 20402. 174 pages, $1)

A limited number of copies of the Proceedings of the Conference on Prenatal Irradiation Effects on CNS Development and Postnatal Behavior are now available. The meeting, which took place in Washington, 4–6 October 1963, was devoted to discussions of U.S. and Russian research. Copies of the proceedings may be obtained free of charge from Jack Werboff, Jackson Laboratory, Hamilton Station, Bar Harbor, Maine 04609.

Scientists in the News

Nathan S. Kline, Director of Research, Rockland State Hospital, New York, has been awarded the $10,000 1964 Albert Lasker Foundation Clinical Research Award for his work in the field of mental illness. Kline received the award for work on the use of monamine oxidase inhibitors in the treatment of severe depressions. His research led to the use of anti-depressant drugs in state mental hospitals and private practice, allowing many patients to be treated outside mental hospitals.

Two California doctors will share the $10,000 1964 Albert Lasker Foundation Basic Medical Research Award. They are:

Renato Dulbecco, Resident Fellow, The Salk Institute of Biological Studies, San Diego, for his early work on bacterial viruses, leading to the development of methods for investigating the process of viral infection of normal cells in culture; for his research into the application of these methods, resulting in the finding that cancerous transformation can occur in the absence of virus multiplication; and

Harry Rubin, professor of virology, University of California, Berkeley, whose work "has given new insight into the mode in which cancer-producing RNA viruses bring about the transformation of normal cells into cancer cells while disclosing, at the same time, other facts of broad biological significance."

Bruno J. Zwolinski, professor of chemistry and director of the chemical thermodynamic properties center at Texas A&M University, has been named head of the school's chemistry department.

Frank F. Lee, formerly head of the department of sociology-anthropology at Oakland University, Rochester, Michigan, has been appointed chairman of the sociology-anthropology department at Northeastern University. Lee succeeds Donald Pitkin, who will be in charge of the sociology-anthropology department at Amherst College.

The following have been appointed members of the National Advisory General Medical Sciences Council, National Institute of General Medical Sciences:

Theodore H. Bullock, professor of zoology, University of California, Los Angeles;

Oliver H. Lowry, head, department of pharmacology, Washington University School of Medicine, St. Louis;

Geraldine P. Woods, a neuroembryologist and former president of both the California State and Southern California Women's Auxiliary to the Medical, Dental, and Pharmaceutical Association.

Each will serve a 4-year term, ending in 1968.

John Stirling Meyer, chairman of the department of neurology at Wayne State University's school of medicine and director of neurology at Harper Hospital, has been named to a 4-year term on the National Advisory Council to the National Institute of Neurological Diseases and Blindness.

Leonard R. Solon, who holds an appointment as adjunct associate professor of industrial medicine at New York University, has accepted a position with the Del Electronics Corporation as manager for research and development programs.

Pancheti Koteswaram, director of aviation services of the India Meteorological Department, has been named visiting professor of atmospheric sciences at the University of Miami (Fla.) School of Environmental and Planetary Sciences.

William H. Summerson, formerly chief scientist at the U.S. Army EDGE-wood Arsenal, Maryland, has become director of the Food and Drug Administration's Bureau of Scientific Research.

James A. Halsted has been named deputy assistant chief medical director for research and education at the Veterans Administration office in Washington, D.C. Halsted was formerly associate chief of staff for research at the VA hospital in Dearborn, Michigan, and professor of medicine at Wayne State University School of Medicine.

Recent Deaths

Henry T. Darlington, 89; professor emeritus of botany, Michigan State University; 23 October.

Richard Winslow Foster, 44; associate in mollusks, Harvard Museum of Comparative Zoology, Boston, Mass.; 3 September.

Ray J. Friant, 73; retired agronomist of the extension division, agronomy department at the University of West Virginia; 25 October.

Henry C. Froula, 49; an organizer of the Electron Microscopy Laboratory, department of engineering, University of California, Los Angeles; 8 September.

John Wesley Hazen, 63; formerly faculty member of the department of engineering, University of California, Los Angeles; 3 August.

Clarence Hylander, 67; former chairman of the botany department, Colgate University, and visiting professor of botany, Pomona College, Claremont, California; 8 October.

William H. Powers, 64; associate dean for the Commonwealth Campuses and Continuing Education in the College of Science, Pennsylvania State University; 29 August.

Orville T. Wilson, 78; associate professor emeritus of botany and bacteriology at the University of Cincinnati; 28 October.

Erratum: In the report "Prehistoric archeological surveys and excavations in Afghanistan: 1959–1960 and 1961–1963" by Louis Dupree (30 Oct., p. 638), the location of the Institute for Geology mentioned in the legend to Fig. 2 and in reference (11) was incorrectly given as Hamburg. The Institute is located in Hanover.
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RADIOLOGICAL HEALTH AND SAFETY IN MINING AND MILLING OF NUCLEAR MATERIALS
Proceedings of a symposium held in Vienna, August 26-31, 1963, by IAEA in cooperation with ILO and WHO. Contents: (Vol. I) Historical review and epidemiology; General health and safety problems; Toxicology; Maximum permissible radiation levels and concentrations. (Vol. II) Technical problems of radiological protection; Waste management; Monitoring programmes in mines and mills and the environment; Medical supervision and assessment of internal contamination; Standards and regulations; Closing summary. (1964) Vol. I: 480 pp., $10.00 Vol. II: 560 pp., $11.00

NEW NUCLEAR MATERIALS INCLUDING NON-METALLIC FUELS
Proceedings of an IAEA conference held in Prague, July 1-5, 1963. Principal subjects: ceramic fuels such as oxides and carbides of uranium, their fabrication and properties; fabrication of reactor components with new materials such as beryllium-oxide powder and silicon-impregnated carbon. (1963) Vol. I: 564 pp. Vol. II: 568 pp. $11.00 per volume

RADIOISOTOPES IN HYDROLOGY

DIAGNOSIS AND TREATMENT OF RADIOACTIVE POISONING
Report of a scientific meeting convened by IAEA and WHO in Vienna, October, 1962. Contents: Early evaluation; Radium; Strontium; Other fission products and radionuclides; Plutonium and other transuranium elements; Treatment. (1963) 450 pp. $9.00

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involve the formation of an intermediate between DPNH and triphosphopyridine nucleotide (TPN).

A second session, chaired by E. C. Slater, continued the discussion of mitochondrial compartmentation. Van Dam's determination of the relationship between the amplitude of the "ATP (adenosine triphosphate) jump" in rat liver mitochondria and the simultaneous appearance of diphosphopyridine nucleotide (DPN) leads to the tentative conclusion that the jump in ATP does not provide, as heretofore believed, evidence for high-energy intermediates of the respiratory chain. However, the need for verifying in terms of oxygen utilization the oxidation of DPNH and the consequent synthesis of ATP was emphasized by Estabrook. The difficulties of carrying out this experiment at low temperatures where the reactions of ADP are slow were pointed out.

As a second topic, the site of inhibition by atractylate was discussed. M. Klingenberg and his co-workers and A. Kemp and E. C. Slater presented evidence that, unlike oligomycin, atractylate does not inhibit the phosphorylation of mitochondrial ADP by inorganic phosphate, but that it prevents the interaction of external nucleotides with the internal mitochondrial pool of the mitochondria. This conclusion, which disagrees with those presented at the Sixth International Congress by Azzone and Bruni and by P. Vignais, is in agreement with Bruni's finding that atractylate prevents the binding of adenine nucleotides to the mitochondrial membrane, and J. B. Chappell's observation that all mitochondrial reactions supported by ATP (with the exception of adenylate kinase) are inhibited by atractylate. W. C. Hülsmann presented experiments suggesting that carnitine can stimulate mitochondrial respiration by relieving a block in the Krebs cycle at the α-ketoglutarate step, caused by a high ratio of acyl-CoA to free CoA.

A session devoted to cation uptake by mitochondria was chaired by H. Rasmussen, who emphasized the similarities and differences of calcium and magnesium uptake. B. C. Pressman discussed the structures of a number of antibiotics, among them valinomycin and gramicidin, in relation to the stimulation of active transport of sodium and potassium in mitochondria. Carafoli and Lehninger described the concomitant uptake of ATP with calcium in mitochondria with an observed stoichiometry of about 1 ATP for every 10 Ca++. This uptake of adenine nucleotide served to balance in part the electrostatic charges associated with calcium accumulation. Klingenberg presented similar data on the concomitant uptake of adenosine diphosphate (ADP) during calcium accumulation; apparently a difference in results exists. The possibility that other cations such as sodium or potassium were transported during oxidative phosphorylation was considered, as was the nature of the high-energy compound which contributes the energy source for ion uptake. Chappell described experiments similar to those of Pressman in which gramicidin was used to stimulate potassium uptake and hydrogen ejection, and proposed a mechanism whereby hydrogen-ion transport out of the mitochondria might be accompanied by the uptake of divalent cations such as calcium and strontium or of monovalent cations such as potassium or ammonium ion, with or without the concomitant uptake of phosphate. In the case of
ammonium ion uptake, charges are balanced and proton ejection was not to be expected, while proton ejection could be observed in the case of divalent cations. Chappell and Chance emphasized the lack of respiratory stimulation in the reaction of potassium with the mitochondrial constituents. The sites of ion accumulation were actively discussed by Chappell, L. Peachey, J. Brierley, and Klingenberg, and it was concluded that the deposits of calcium can be observed in mitochondria associated with the membrane subunits (IMS) on the membranous part as well as in the matrix. The general hypothesis that the matrix compartment is the area where cation accumulation occurs was presented, and Peachey emphasized that the normal granules of the matrix space provide a suitable point for calcium accumulation. The possible relation between ion uptake in mitochondria and in the whole cells was discussed by A. Kleinzeller, who emphasized the possible usefulness of the concepts developed from studies with whole cells to the mitochondrial problems.

In the session on the swelling of mitochondria, chaired by A. Lehninger, a number of factors affecting large-amplitude swelling were discussed by Hunter, Azone, and Lehninger, with particular reference to the properties of peptides such as oxytocin and gramicidin (the latter participates in cation transport). The present status of contractile protein was evaluated by Azone and Lehninger and compared with properties of the cold labile adenosine triphosphatase and actomyosin.

The effect of a soluble relaxing-factor preparation upon mitochondrial contraction caused by the addition of ATP and magnesium was discussed by H. Baltscheffsky, and experiments illustrating the temporary inhibition of contractility were presented. Lastly, the physical changes that occur in mitochondria in large-amplitude swelling were described by Lehninger, with particular emphasis on the fact that the basic lipid bi-layers of which the cristal membrane may well be composed cannot stretch to the degree required to explain large-amplitude swelling. The general question of the shape of the cristae in nature was evaluated critically, and it was pointed out that fewer cristae are observed in 0.44M than in 0.32M sucrose. A number of properties of mitochondria prepared in a high concentration of sucrose differ from those prepared in low sucrose concentration, particularly their high content of endogenous substrate and the relatively small response to added ADP. Chance presented the hypothesis that cristae may well be in the "collapsed" state as observed by Stoeckenius. The cristal structure would be held in this condition by cross-links between adjacent cristae, which may well involve portions of the projecting subunits, that is, either a zipper-like interlocking of the heads or (in view of the evidence suggesting that the subunits project into the matrix space) an extension of these cross-links, allowing for a reasonable amount of swelling and shrinkage; in large amplitude swelling the cross-links may be entirely broken.

All in all the "compositum" a (polyglot term created by Bücher) appeared to be highly successful. The presence of experts on morphology as well as on enzymology helped to focus on the major areas currently under active investigation. A greater appreciation of the two approaches was achieved. In brief, the

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Forthcoming Events  
November  
23-27. Use of Radiisotopes in Animal Nutrition and Physiology, symp., Intern. Atomic Energy Agency, Food and Agriculture Organization of the UN, Prague, Czechoslovakia. (Symp. Secretariat, Kärntnerstrasse 11, Vienna 1, Austria)  
23-28. Internal Medicine, 8th intern. congr., Buenos Aires, Argentina. (Secretariat, Melo 2081, Buenos Aires)  
26-28. Central Assoc. of Science and Mathematics Teachers, 64th annual, Detroit, Mich. (Sister Mary Ambrosia, Gesu Convent, 17180 Oak Drive, Detroit 48221)  
27-28. National Council for Geographic Education, Minneapolis, Minn. (L. Kennamer, Univ. of Texas, Austin)  
29-7. Association for Research in Oph-

meeting, although loosely organized, served as a forum for the extensive discussion in depth of current hypotheses dictating the direction of research in mitochondrial structure, biological oxidations, and associated energy-transfer reactions.

The organizers of the Malvern meeting are deeply indebted to Mrs. L. S. L. Chance and to the panel chairmen, Drs. Linnane, Palace, Ernst, Slater, Rasmussen, and Lehninger. The ability of these discussion leaders to set the rapid tempo of the meeting was the direct factor responsible for the success of this postconference discussion session.

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4-5. American Rheumatism Assoc., annual, Washington, D.C. (J. A. Coss, Jr., 20 E. 76 St., New York 10021)
4-5. American Rheumatism Assoc., 11th interinst. scientific session, National Institutes of Health, Bethesda, Md. (G. W. Speyer, ARA, 10 Columbus Circle, New York 10019)
4-5. Association for Research in Nervous and Mental Diseases, New York, N.Y. (R. J. Masselink, ARMD, 700 W. 168 St., New York 10023)
4-5. Oxygen in Biosisystems, basic science symp., New York, N.Y. (Miss J. Newkirk, New York Heart Assoc., 10 Columbus Circle, New York 10019)
4-5. Southern Soc. for Pediatric Research, Houston, Tex. (F. K. Edwards, Emory Univ. School of Medicine, Thomas K. Glenn Memorial Bldg., 69 Butler St., Atlanta, Ga. 30303)
4-6. American Psychoanalytic Assoc., fall meeting, New York, N.Y. (APA, 1 E. 57 St., New York 10022)
4-9. American Acad. of Dermatology, Chicago, Ill. (S. E. Huff, AAD, 636 Church St., Evanston, Ill.)
5-6. Academy of Psychoanalysis, midwinter meeting, New York, N.Y. (A. H. Rifkin, AP, 125 E. 65 St., New York)
6. American Acad. of Dental Medicine, mid-annual meeting, New York, N.Y. (S. C. Conrad, 133-28 228th Street, Laurelton, L.I.)
6-10. American Inst. of Chemical Engineers, annual, Boston, Mass. (J. Henry, AIChE, 345 E. 47 St., New York 10017)
6-12. Latin American Congr. on Microbiology, 3rd, Bogota, Columbia. (O. Julio, Instituto Nacional de Salud, Apto, Aereo 3495, Bogota)
7-9. Southern Surgical Assoc., meeting, Hot Springs, Va. (G. H. Yeager, University Hospital, Baltimore 1, Md.)
12-15. American Acad. of Optometry, annual, Columbus, Ohio. (C. C. Koch, AAO, 1506-08 Foshay Tower, Minneapolis 2, Minn.)
14-16. Hahmemann Medical College, 13th symp., Philadelphia, Pa. (J. H. Moyser, Dept. of Medicine, Hahmemann Medical College, Philadelphia)
14-16. Refiulcoendothelial Soc., meeting, New York, N.Y. (N. R. Di Luzio, Univ. of Tennessee Medical Units, Memphis)
14-17. Adipose Tissue Metabolism and Obesity, conf., New York, N.Y. (B. N. Brodoff, New York Acad. of Sciences, 2 E. 63 St., New York)
14-18. Conference on Nuclear Electronics, Bombay, India (International Atomic Energy Agency, Karntnerring 11, Vienna 1, Austria)
14-22. International Geological Congr., 22nd, New Delhi, India. (Secretary-Gen. of the Congress, c/o Geological Survey of India, 27, Chowringhee, Calcutta 13)
14-22. International Mineralogical Assoc., 4th general, New Delhi, India. (J. V. Smith, c/o Dept. of Geophysical Sciences, University of Chicago, Chicago, Ill.)
15-18. Relativistic Astrophysics, symp., Univ. of Texas and Southwestern Center for Advanced Studies, Austin. (Mrs. J. Wardlaw, Dept. of Physics, Physics Bldg. 438, Univ. of Texas, Austin 78712)
16-21. Inter-American Congr. of Psychology, 9th annual, Miami, Fla. (V. D. Yehia, Univ. of Miami, 110 W. 57 St., New York 10009)
20-24. Theoretical and Applied Mechanic.s, congr., Kanpur, India. (M. K. Jain, Indian Inst. of Technology, Kharagpur, India)
21-23. Biology of Marine Microorganisms, conf., Univ. of California, Berkeley. (R. Newton, Letters and Science Extension, Univ. of California, Berkeley 94720)
26-29. Society of Systematic Zoology, American Soc. Zoologists/Herpetologists' League, annual, Univ. of Tennessee, Knoxville. (J. G. Rozen, Jr., Dept. of Entomology, SSZ, American Museum Natural History, Central Park West and 79th St., New York, N.Y.; A. Richards, Dept. of Entomology, Univ. of Minnesota, St. Paul 55101; J. M. Legler, HL, Dept. of Zoology, Univ. of Utah, Salt Lake City)

The following 45 organizations will meet in conjunction with the AAAS annual meeting in Montreal, Canada, 26-31 December:

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