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soonian method used for studying continuous recognition memory. The method appears to be an elegant technique for this purpose and is applicable wherever the elimination or control of response bias is essential to the matching of theory and experiment (Roger N. Shepard and Jih-Jie Chang, Bell Telephone Laboratories). In quite a different vein, other data on the retention of single events stressed the variability of retention performance as a function of time (Edward A. Bilodeau, Tulane University).

The symposium on Experimental-Theoretical Approaches to Memory was intended to set in juxtaposition the approaches of the neurophysiologist, the psychologist working within the framework of communication concepts and mechanisms, the psychologist working within the traditions of stimulus-response functionalism, and the psychologist working with the new tools for computer-modeling of behavior mechanisms. The principal emphases were concerned with: the "consolidation" hypothesis regarding fixing of neural traces for permanent storage (Ralph W. Gerard, University of Michigan); the dichotomy of short-term and long-term memory storage based principally on the non-dependence of the former on the similarity relations of disrupted and disrupting activities and the well-known dependence of the latter on such relations (Donald E. Broadbent, Applied Psychology Research Unit, Cambridge); the issues raised by evidence that the interference theory of forgetting predicts too much forgetting (Leo Postman, University of California); and the fertility and guidance value of logical, quantitative models, such as are suitable for realization on a computer, for theorizing about memory and learning (Earl B. Hunt, University of California).

The vice-presidential address by Arthur W. Melton was the final event in this series on memory. After identifying a number of current issues in learning theory as issues about the formation, storage, and retrieval of memory traces, the major general issue was identified as the question whether short-term memory and long-term memory are points on a continuum. An affirmative answer was expressed, based not only on the data of others who have used the method of recall of single to-be-remembered items following a single or very few repetitions, but also on new data that relate the slope of the short-term forgetting curve to the num-

ber of elements or encoded "chunks" in the to-be-remembered unit. Also, new data confirming and extending Hebb's repetition effect in the context of the memory-span experiment were cited as support for the continuity of short- and long-term memory. The principal consequence of this conclusion was suggested as the extension of the postulate of permanence of memory traces to include the permanence of traces established by single occurrences of events in the life of the organism, although the data also seem to suggest preferences among the alternative assumptions offered as solutions to other critical issues in general theory of memory.

The vice-presidential address, the symposium papers, and a number of the other invited papers will be published in a special issue of the *Journal of Verbal Learning and Verbal Behavior*.

ARTHUR W. MELTON

University of Michigan, Ann Arbor

Forthcoming Events

May

2-5. Cytoplasmic Streaming, Cell Movement, and Saltatory Motion of **Subcellular Particles**, symp. Princeton, N.J. (R. D. Allen, Dept. of Biology, Princeton Univ., Box 704, Princeton)

3. **Astronomy and the Peaceful Uses of Space**, Evanston, Ill. (J. A. Hynek, Astronomy Dept., Northwestern Univ., Evanston)

3-4. Colorado-Wyoming **Acad. of Science**, Fort Collins, Colo. (R. G. Beidleman, Dept. of Zoology, Colorado College, Colorado Springs)

3-4. **Endocrinology**, 2nd intern. congr., London, England. (A. S. Mason, London Hospital, Whitechapel, London, E.1)

3-4. Minnesota **Acad. of Science**, St. Paul. (M. R. Boudrye, 1821 University Ave., St. Paul 4)

3-4. Nebraska **Acad. of Sciences**, Lincoln. (C. B. Schultz, 101 Morrill Hall, Univ. of Nebraska, Lincoln 8)

3-4. North Dakota **Acad. of Science**, Grand Forks. (B. G. Gustafson, University Station, Grand Forks)

3-5. **Protides of the Biological Fluids**, 11th colloquium, Bruges, Belgium. (H. Peeters, St. Jans Hospital, Bruges)

3-5. Wisconsin **Acad. of Sciences, Arts and Letters**, Milwaukee. (T. J. McLaughlin, Univ. of Wisconsin, Milwaukee 11)

3-6. American **Psychoanalytic Assoc.**, St. Louis, Mo. (H. Kohut, 664 N. Michigan Ave., Chicago 11, Ill.)

4-5. International Soc. of **Craniofacial Biology**, annual, Miami Beach, Fla. (S. Pruzansky, Univ. of Illinois, 808 Wood St., Chicago 12)

4-5. Academy of **Psychoanalysis**, an-

nual, St. Louis, Mo. (A. H. Rifkin, 125 E. 65 St., New York 21)

5-7. **Biometric Soc.**, eastern North American regional, Cambridge, Mass. (J. Cornfield, School of Public Health, Johns Hopkins Univ., Baltimore, Md.)

5-8. American Inst. of **Chemical Engineers**, Buffalo, N.Y. (F. J. Van Antwerpen, American Inst. of Chemical Engineers, 345 E. 47 St., New York, N.Y.)

5-8. Physical Processes in **Radiation Biology**, intern. symp., East Lansing, Mich. (B. Alderman, Room 24, Kellogg Center, Michigan State Univ., East Lansing)

5-9. American Soc. for **Microbiology**, Cleveland, Ohio. (R. W. Sarber, 115 Huron View Blvd., Ann Arbor, Mich.)

5-9. **Orthodontists**, inter-American meeting, Miami, Fla. (J. A. Salzman, American Assoc. of Orthodontists, 654 Madison Ave., New York 21)

6-10. **Atmospheric and Space Electricity**, 3rd intern. conf., Montreux, Switzerland. (H. R. Byers, Dept. of Geophysical Sciences, University of Chicago, Chicago 37, Ill.)

6-10. American **Industrial Hygiene** Assoc., conf., Cincinnati, Ohio. (G. D. Clayton, 14125 Prevost, Detroit 27, Mich.)

6-10. American **Psychiatric** Assoc., 119th annual, St. Louis, Mo. (R. L. Robinson, APA, 1700 18th St., NW, Washington 9)

7-8. **Histochemical** Soc., 14th annual, Washington, D.C. (M. Wachstein, Dept. of Pathology, St. Catherine's Hospital, Brooklyn 6, N.Y.)

7-9. American Soc. of **Lubrication Engineers**, Chicago, Ill. (M. M. Gurgo, Humble Oil Co., P.O. Box 2180, Houston 1, Tex.)

7-9. **Electronic Components** Conf., Washington, D.C. (Inst. of Radio Engineers, 1 E. 79 St., New York 21)

7-11. East-West **Diabetic Workshop**, 2nd intern., Chicago, Ill. (R. B. Hearst, 55 E. Washington, Chicago 2)

7-27. **World Health** Assembly, 16th, Moscow, U.S.S.R. (WHO, Palais des Nations, Geneva, Switzerland)

8-10. American Inst. of **Chemists**, Philadelphia, Pa. (J. Kotrady, American Inst. of Chemists, 60 E. 42 St., New York 17)

8-12. National **Science Education** Exposition, New Mexico Acad. of Science, Albuquerque. (The Academy, 5900 Domingo Rd., NE, Albuquerque)

9-11. **Aluminum** Conf., Hungarian Mining and Metallurgical Assoc., Budapest. (Hungarian Mining and Metallurgical Assoc., Szabadsag ter 17, III/307, Budapest 5)

9-14. American Inst. of **Industrial Engineers** natl. meeting, Denver, Colo. (W. J. Jaffe, Newark College of Engineering, Newark, N.J.)

10-11. North Carolina **Acad. of Science**, Greenville. (J. A. Yarbrough, Meredith College, Raleigh, N.C.)

12. American **Pharmaceutical** Assoc., Miami Beach, Fla. (W. S. Apple, 2215 Constitution Ave., NW, Washington, D.C.)

12-13. **Biology** Colloquium, 24th annual, Oregon State Univ., Corvallis. (F. A. Gilfillan, School of Science, Oregon State Univ., Corvallis)

12-14. **Excerpta Medica** Foundation,

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Amsterdam, Netherlands. (Headquarters, 111, Kalverstraat, Amsterdam)

12-17. American Soc. of **Hospital Pharmacists**, Miami Beach, Fla. (J. A. Oddis, 2215 Constitution Ave., NW, Washington, D.C.)

13-14. National Assoc. of **Boards of Pharmacy**, Miami Beach, Fla. (F. T. Mahaffey, 77 W. Washington St., Chicago 2, Ill.)

13-16. **Histochemistry**, intern. symp., Warsaw, Poland. (H. G. Godlewski, Inst. of Exptl. Pathology, Polish Acad. of Sciences, Dworkowa 3, Warsaw 12)

13-17. American Soc. of **Civil Engineers**, Milwaukee, Wis. (W. H. Wisely, ASCE, 345 E. 47 St., New York 17)

13-17. National League for **Nursing**, Atlantic City, N.J. (NLN, 10 Columbus Circle, New York 19)

13-18. **Condensation Nuclei**, 5th intern. symp., Clermond-Ferrand and Toulouse, France. (H. Dessens, Laboratoire de Physique du Globe, Faculté des Sciences, Univ. de Toulouse, Toulouse)

14-19. **Mass Spectroscopy**, 11th conf., San Francisco, Calif. (N. D. Coggeshall, Gulf Research and Development Co., P.O. Drawer 2038, Pittsburgh 30, Pa.)

15-17. **Transplutonium Elements**, symp., Argonne, Ill. (D. C. Stewart, Chemistry Div., Argonne Natl. Laboratory, 9700 S. Cass Ave., Argonne)

15-18. **Acoustical Soc. of America**, New York, N.Y. (W. Waterfall, American Inst. of Physics, 335 E. 45 St., New York 17)

16-17. **Aromatic Biosynthesis and Metabolism**, Saskatoon, Canada. (A. J. Fin-

layson, Prairie Regional Laboratory, National Research Council, Saskatoon)

16-17. **Metallurgical Problems in Electronic Technology**, New England regional conf., Boston, Mass. (Metallurgical Soc. of the American Inst. of Mining, Metallurgical, and Petroleum Engineers, 345 E. 47 St., New York 17)

16-18. International Assoc. for **Bronchology**, 13th congr., Zurich, Switzerland. (E. Steinmann, Tödsstr. 36, Zurich 2)

16-18. **Diabetology**, 4th, Paris, France. (M. Rathery, Hotel-Dieu, Place du Parvis Notre Dame, Paris 4)

17-18. **Surface Physics**, symp., Pullman, Wash. (E. E. Donaldson, Dept. of Physics, Washington State Univ., Pullman)

18. Southern California **Academy of Sciences**, Los Angeles. (G. Sibley, Los Angeles County Museum, 900 Exposition Blvd., Los Angeles 7)

19-24. **Mass Spectrometry and Allied Topics**, 11th annual conf., San Francisco, Calif. (N. D. Goggeshall, Gulf Research & Development Co., P.O. Drawer 2038, Pittsburgh 30, Pa.)

20-22. Institute of Radio Engineers, Professional Group on **Microwave Theory and Techniques**, symp., Santa Monica, Calif. (I. Kaufman, Space Technology Laboratories, Inc., 1 Space Park, Redondo Beach, Calif.)

20-23. **Humidity and Moisture**—Measurement and Control in Science and Industry, intern. symp., Washington, D.C. (A. Wexler, National Bureau of Standards, Washington 25)

20-23. **Spectroscopy**, 14th annual mid-

American symp., Chicago, Ill. (J. E. Forrette, Roy C. Ingersoll Research Center, Wolf and Algonquin Rds., Des Plaines, Ill.)

21-23. **Australian Mathematical Soc.**, Clayton, Victoria, Australia. (G. C. Smith, Dept. of Mathematics, Monash Univ., Clayton)

21-23. Joint **Computer Conf.**, Detroit, Mich. (B. W. Pollard, Burroughs Corp., 6071 Second Ave., Detroit 32)

21-23. **Radioisotopes**, 5th Japanese conf., Tokyo. (J. H. Kane, Div. of Special Projects, U.S. Atomic Energy Commission, Washington 25)

22-25. **Space**, 3rd European symp., Stuttgart, Germany. (U. Seeliger, Verkehrsamst der Stadt Stuttgart)

22-31. **Scientific and Technical Press and Books**, 1st intern. exhibition, Paris, France. (Groupe des Editeurs de Livres de Sciences et de Techniques, Syndicat National des Editeurs, Cercle de la Librairie, 117 Boulevard St. Germain, Paris 6)

23-24. **Radiosensitizers and Radioprotective Drugs**, 1st intern. symp., Milan, Italy. (R. Paoletti, Inst. of Pharmacology, Univ. of Milan, Via A. Sarto 21, Milan)

23-24. **Southern Textile Research**, 3rd conf., Pinehurst, N.C. (M. P. Underwood, P.O. Box A-2, Greensboro, N.C.)

23-25. American Assoc. for **Cancer Research**, Inc., Toronto, Canada. (H. J. Creech, Inst. for Cancer Research, Fox Chase, Philadelphia 11, Pa.)

23-25. American Soc. for **Quality Control**, Chicago, Ill. (C. E. Fisher, Bell Telephone Laboratories, 463 West St., New York 14)

23-26. **Nuclear Fuel Reprocessing**, Eurochemic symp., Brussels, Belgium. (O.E.C.D., European Nuclear Energy Agency, 38 Boulevard Suchet, Paris 16°, France)

26-27. Society for **Industrial and Applied Mathematics**, Menlo Park, Calif. (R. D. Gaskell, Dept. of Mathematics, Oregon State Univ., Corvallis)

26-29. Institute of **Food Technologists**, Detroit, Mich. (C. L. Willey, Inst. of Food Technologists, 176 W. Adams St., Chicago 3, Ill.)

26-31. American **Physical Therapy Assoc.**, New York, N.Y. (L. Blair, APTA, 1790 Broadway, New York 19)

26-1. **Mineral Processing**, 6th intern. congr., Cannes, France. (D. A. Dahlstrom, Eimco Corp., 301 S. Hicks Rd., Palatine, Ill.)

27. **Operations Research Soc. of America**, Transportation Science Section, Cleveland, Ohio. (L. C. Edie, Port of New York Authority, 111 Eighth Ave., New York 11)

27-29. Canadian **Nuclear Assoc.**, 2nd intern. conf., Montreal, Canada. (CNA, 19 Richmond St., W., Toronto 1, Canada)

27-29. **Frequency Control**, 17th annual symp., Atlantic City, N.J. (Headquarters, U.S. Army Electronics Research and Development Laboratory, Fort Monmouth, N.J.)

27-30. **Tissue Culture Assoc.**, 14th annual, Boston, Mass. (R. L. Sidman, Laboratory of Cellular Neuropathology, Harvard Medical School, 25 Shattuck St., Boston 15)

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