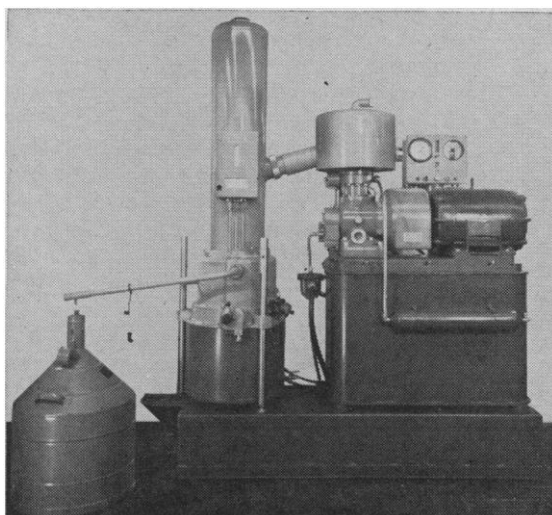
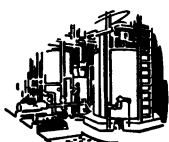




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## Meetings

### Memory

Memory was the topic of ten invited papers of new research findings, a symposium, and the vice-presidential address by the retiring chairman of the Psychology Section (I) at the AAAS Philadelphia meeting in December 1962. The major emphasis was on human memory and within this emphasis the principal focus was on short-term human memory.

The session of invited papers contained a variety of significant investigations. On the issue of the distinction between very-short-term stimulus traces and encoded memory traces, a reinforcement of earlier findings on distinctions between preperceptual and postperceptual (memory) traces was made. Evidence was presented that showed the memory span is greatest for digits, next for letters, and shortest for colors or shapes, and that these differences are related to differences in the time required for reading those items from the brief visual presentation plus the very-short-term visual trace (Jane F. Mackworth, Defense Research Medical Laboratories). Further discussion on the same general problem dealt with the testing and confirmation of the notion that the perceptual encoding of even a small number of dots in a two-dimensional field is sequential rather than parallel. A procedure of stimulus-trace erasure had been used to obtain these data (Emanuel Averbach, Bell Telephone Laboratories).

Several papers described the effects of repetition on short-term memory. A talk on associative memory over brief intervals of time showed an interaction of the interval between repetitions of a word-number pair and the retention interval (up to 16 seconds) in determining recall; also noted was an optimum retention interval of 8 to 16 seconds between the two repetitions prior to a 16-second recall interval (Lloyd R. Peterson, Indiana University). In discussions on immediate memory as a function of repetition, results of experiments which utilized immediate free recall of a list of 30 words were described. It was found that words occurring twice were recalled better than words occurring only once, but that this effect was not a function of the number of other words intervening between the repetitions nor of the number of repeated words in the list when

the number was greater than one. These beneficial effects of repetition were, however, present only when the subject was primed to recognize the repeated words (Nancy C. Waugh, Harvard University). Another experiment with paired letters in which the letter pairs had either low or high initial associative strength showed that recall (after 1 or 7 days) increased directly as a function of frequency of repetition. However, contrary to interference theory, recall was the same for the two types of list even though, consistent with the theory, the extra-experimental intrusion errors in recall were identifiable as previously established letter-sequence habits (Benton J. Underwood, Northwestern University).

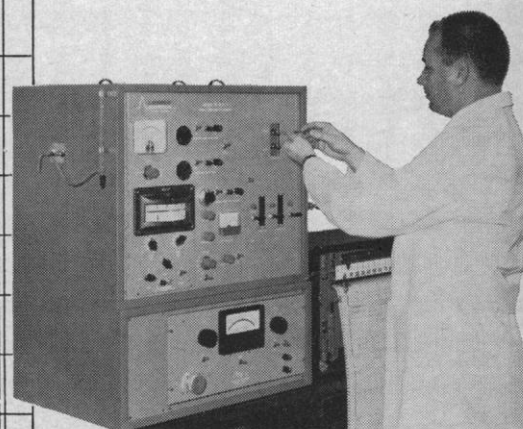
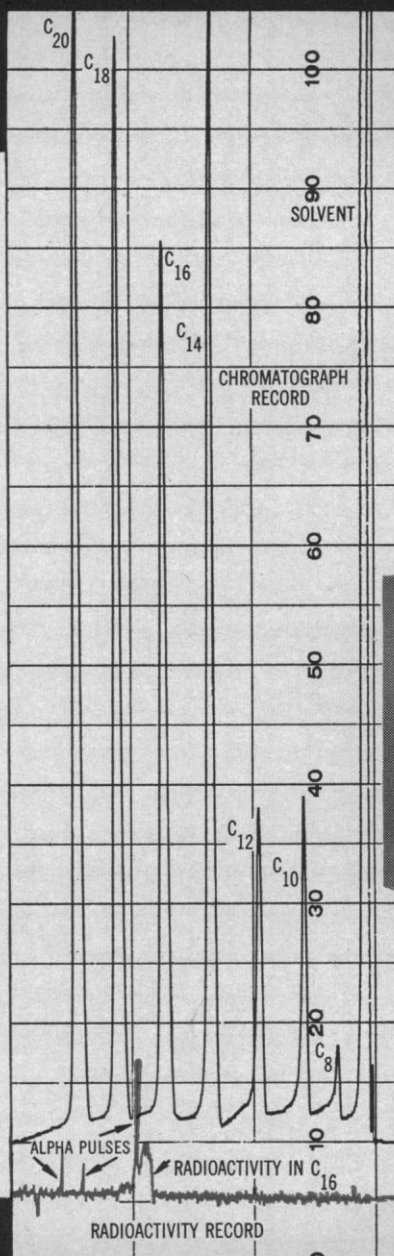
One study involving the continuous presentation and recall of paired associates revealed the facilitating and inhibiting effects in short-term recall of mixing or keeping homogeneous the categories of words attached to the same or different letter stimuli (L. Starling Reid, University of Virginia). Arguments and evidence for considering recall as determined not only by previously established associations, but also by the logical processing of these memory data were presented. In support of the former a report was made on the rather extraordinary capacity of human subjects for discriminating the order of occurrence of events in the past (temporal "tags"); in support of the latter, a repetition of the Broadbent experiment on short-term memory in dichotic listening showed that the order of report was determined by the kind of event rather than the ear involved (Douwe B. Yntema, Massachusetts Institute of Technology).

Single presentation of a series of word-number pairs (or nonsense-syllable-number pairs) and recall after varying intervals up to days showed that associations involving low arousal (basal metabolism rate) at the time of presentation suffer the usual forgetting over time but that associations involving high arousal were inhibited at short retention intervals and gain in apparent strength over time. These findings were then related to the "consolidation" theory of memory traces (Edward L. Walker, University of Michigan).

A final report was aimed primarily at the methodology of memory studies. The first experiments utilized a forced-choice technique, which is designed to circumvent or manipulate the strong effects of response bias in the now widely-employed Shepard and Teght-

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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-