EXPERIMENTAL.

Ueber die 'Verschmelzung' von Empfindungen, besonders bei Klang-eindrucken. EJNAR BUCH. Philos. Stud., XV., 1-66; 183-278.

These articles were first published in Danish as the habilitation address of the author in the University of Denmark. The first is theoretical, containing a criticism of current theories of fusion, especially those of Stumpf, Cornelius, Helmholtz, Wundt, Külpe, and James. He takes up in order the subjects of attention, apprehension or perception (*Auffassung*), analysis, and fusion proper. The rôle of interest in voluntary attention is illustrated by examples from genetic psychology. The perception of a complex sense presentation is shown to depend upon interest and knowledge of the fusing elements. Then interest and previous experience, as determining the observer's attitude toward the presentation, are found to be important factors in determining the limits of analysis or fusion. His definition of fusion is essentially expressed in the following: We speak of fusion when we encounter a number of stimuli which, in place of each arousing its own sensation as clearly and distinctly as if it appeared alone, produce a combination-presentation or presentation-mass in which a change would take place upon the elimination of one of the stimuli. The avowed object of the research is to determine by experiment whether this fusion is a mental process by itself or is simply the general designation for known influences upon perception.

The second article contains the report of the experiments. The principal apparatus consisted of a series of twenty-three organ pipes with a manometric contrivance by means of which the pipes could be energized with equal force. A variety of combinations of tones were produced by sounding the pipes simultaneously in pairs. The principal tests were made upon nine observers who were simply required to state whether they heard one or two tones. The observers fall into two classes according to the attitude they take toward the presentation. One class of observers attempt to analyze the tone and consider failure to perform the analysis a criterion of fusion. The other observers seem to judge merely by the general effect. This difference in method brings about radical differences in the results, each class however, presenting some common characteristics. Tones at some intervals apart have a greater tendency to fuse than at other intervals. The intervals may be arranged in a series according to the number of times the respective tones fused in these experiments. The author shows by an elaborate analysis of the results that these differ-

ences may be accounted for by the variation of such known factors as consonance, beats between partials, familiarity with certain intervals, etc., and therefore concludes that there is no ground for assuming the existence of degrees of fusion aside from the variation in such factors. In order to check the results, he performed the same experiments using an Appunn 'Tonmesser,' and obtained results that virtually agreed with those obtained with the pipes. Notwithstanding the keen criticism and the careful and elaborate experiments, the author does not arrive at anything essentially new, and the contribution has its chief value in the exposition of his own theory of fusion.

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Neue Untersuchungen über die Zeitverhältniss der Apperception einfacher Sinnesindrücke am Complicationspendel. CHR. D. PFLAUM. Philos. Stud., XV., 139-148.

This is a repetition of Wundt's experiments to determine the direction and extent of disparity in time in the perception of two simultaneous impressions through different senses. The 'Complicationspendel' described in Wundt's *Physiological Psychology* is employed. A pendulum moves a pointer over a circular scale and rings a gong as the pointer passes any desired number. The observer is required to state at what number on the scale the pointer was when the sound occurred. The author finds that the amount and direction of the displacement vary with different individuals and depend upon the speed of the pointer. He thus reconciles the contradictory results previously obtained by Wundt and von Tschisch by showing that there are individual differences just as in the personal equation in the eye and ear method of astronomers. The maximum difference between individuals in this test is about 0.01 sec. which is much less than the differences found in the corresponding personal equations of different astronomers.

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Die Präcision der Blickbewegung und der Localisation an der Netzhautperipherie. CHAS. B. MORREY. Ztsch. f. Psych. u. Physiol. der Sinnesorgane. XX., 317-325.

The author measures the error in the eye-movement, by which we seek to fixate a momentary peripheral stimulus, by the discrepancy between the actual position of an electric spark and the position of a