ture of the method of right associates ordinarily began five minutes after the end of the subject's recitation. The accented syllables were presented in part to the eye and in part to the ear.

Of the writer's findings, the following seem most important: (1) No real criterion of a subject's image-type is furnished either by the number of repetitions necessary for learning with the different procedures or by his remarks upon the procedures. The objective results were lamentably alike for subjects of all image-types. (2) As regards the number of repetitions necessary for learning, the visual-kinæsthetic-auditory, procedure, the visual-kinæsthetic, the visual-auditory and the auditory all have an advantage over the silent, primarily visual procedure. Among the advantages in articulating the syllables may be the fostering of kinæsthetic persistence and the formation of kinæsthetic associations, as well as the steady attention and exact apprehension of the syllables which are involved. On the other hand, the sound of the subject's or of the experimenter's voice in pronouncing the syllables seems to make the impressions more penetrating. The advantage of the auditory procedure is surprising in view of the objections expressed by subjects of all types. (3) As regards the number of right associates scored, the case is reversed: the primarily visual procedure has the advantage over all the others just named. This fact falls under the general law that those series are better remembered which, on any account, are learned with greater difficulty. (4) According to the introspection of the subjects, the method of learning becomes less visual and more kinæsthetic when the series are hard to learn, — when, for example, the subject is tired or the series are rapidly presented. In this connection, it should be noted that the advantage in the subject's reading aloud is more marked when the rate of presentation is quick. The paper abounds in interesting bits of introspection which cannot be given here.

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Beiträge zur Assoziationslehre auf Grund von Massenversuchen.

FERDINAND REINHOLD. *Zeitsch. f. Psychol.*, Vol. 54, pp. 183-214.

This paper is based upon association-experiments made by the method of chance word-reaction upon groups of school children (girls), taken, thirty each, from ten successive grades and ranging in age from seven to seventeen years. Toward the formation of such an 'association-lexicon' as Saling compiled, the writer contributes the

first reactions to forty-six stimulus-words. He interests himself chiefly in the nature of the most common reactions and in the degree to which individual subjects tend to react with the words most common in their group. With the aid of some collateral experiments, he is enabled to draw the following conclusions: (1) In each group of reactions to a given stimulus-word, some one word predominates in such a marked degree over others that the favorite reaction is not at all hard to determine. (2) In the matter of logical relation between the stimulus-word and the favorite reaction-word (the relations of part to whole and of whole to part, for instance), so much difference exists between different stimulus-words that the list of words actually used in any study of such relations is all important and should never be suppressed. (3) Roughly speaking, younger children show greater individual differences in their reactions than older children. (4) In children, at least, a tendency toward extraordinary reactions is not a sign of superior intelligence, nor is a tendency toward associations by similarity of sound a symptom of inferior intelligence.

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TASTE SENSATIONS.

Sensations gustatives. LANGUIER DES BANCELS. *Année psychol.*, Vol. 15, 273-299.

This paper is not a report of the writer's experimental research, but is a clear, concise and excellent review of our present knowledge upon the subject of taste. The writer discusses (1) the number of taste-qualities; (2) taste-stimuli and the ion-theory of their nature, summarizing the results of Höher and Kiesow and of Herlitzka; (3) the anatomy of taste, considering the gustatory field, nasal taste, so-called, and the vexed question of the paths taken by the gustatory nerve-fibers to the brain; (4) the functioning of the sense, touching upon the sensitiveness of the different papillæ to the several qualities, upon taste-mixture, contrast-effects and adaptation-phenomena; and (5) such psychometric results as have been so far obtained.

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ORGANIC SENSATIONS.

Ueber die Sensibilität der inneren Organe. E. BECHER. *Zeit. f. Psychol.*, 1908, XLIX., 341-373.

An article designed to supplement, says the author, an earlier paper