

## PSYCHOLOGY OF READING.

*Experimentelle und kritische Beiträge zur Psychologie des Lesens bei kurzen Expositionszeiten.* ERICH BECHER. *Zeitschrift für Psychol. und Physiol. d. Sinnesorgane*, 1904, XXXVI., 19-73.

This article attempts to settle, mainly in an experimental way, some matters in dispute among former investigators in the field of the psychology of reading. Experiments were made by the tachistoscope method of Erdmann and Dodge, which was supplemented by the use of an electric spark. In order to meet the criticisms of Wundt, care was taken to secure the best adaptation of the retina possible. From a series of preliminary experiments it was concluded that the after image is a negligible factor for the purposes of the investigation.

The main body of the article is concerned with the possibility of the shifting of attention during short periods of exposure. The author's experiments showed that words of as many as twenty-six letters could sometimes be read correctly in the time of the flash of an electric spark. This time is manifestly too short for any shifting of attention, which Wundt and Zeitler think necessary for the reading of words in short periods of exposure.

The hypothesis of Wundt as applying to tachistoscope experiments where the period of exposure was .10 sec. may be stated thus: Everywhere, when we fixate a single point through the sense of sight, the ability to recognize an object depends upon the position of the image of that point upon the retina and the position of the point in the field of attention. We may, therefore, speak of a point of greatest attention and a fixation point. It would then be only an extension of the hypothesis to suppose that during a fixation the unequally favorable position of the point of the field of sight would be made less noticeable by the point of attention being moved successively to the places which are distant from the fixation point.

To test this hypothesis two series of experiments were made. In the first the subject was told to direct his attention to the same point as that upon which the eyes were supposed to be fixated. In the second the subject directed his attention to a point to the left of the fixation point. If the attention keeps shifting during the period of exposure, there should be no practical difference between the results of the two experiments. From the actual results of the experiments, however, it was shown that the number of letters rightly read at the left hand point was more than doubled when the attention was directed

to the place where they appeared. At the same time the number of right hand letters read was smaller than in the other experiment in the case of two observers and remained the same with a third.

Experiments were also made in the reading of letters with red circles about them and plain black letters. If, as Zeitler supposes, the dominating letters can draw the attention in the reading of words during short periods of exposure, then the red marking should do the same. But the experimental results were slightly in favor of the black letters, probably on account of the disturbing influence of the color.

Wundt claims that the reading of words in short periods of exposure is an apperceptive not an assimilative process in his meaning of these terms. The writer regards these two processes as merely different degrees of one and the same process. But his experiments go to show that even in Wundt's use of the term such recognition of words is assimilative. It was found that some of the well known convertible figures used by Wundt could be recognized as either solid or hollow in such short exposure times as .10 seconds. Final syllables such as -en, -er, -es, n, s, were also distinguished, although they contain none of the so-called dominating letters. Similar results were obtained with prefixes. Hence the writer concludes that the gross word form rather than the dominating letters is the important factor in bringing about the recognition and that the process is throughout one of assimilation.

E. H. CAMERON.

YALE UNIVERSITY.

## RELIGION.

*The Soul. — A Study in Past and Present Beliefs.* L. D. ARNETT.  
Amer. J. of Psychol., XV., Nos. 2 and 3.

It is the author's purpose to give a complete historical account of the origin and development of the belief in a soul. The object of such an account is two-fold. It will serve as a comparative study of the opposing views of the ministry and of psychologists with regard to the nature of the soul and may lead to a more definite understanding as to the correct use of the term. It is impossible in summarizing the article to do more than scant justice to the wealth of data upon which the author bases his conclusions. The soul is described by primitive man most frequently as a shadow, as breath, as wind, or as life, heart or echo. The dream is found to be the strongest influence giving rise to the idea of a soul. This idea is closely connected with superstitious belief: it is religious rather than philosophical or psy-