

and Stigler (8), by means of the Roentgen ray, found that the stomach is emptied more rapidly after a meal eaten with relish ('Esslust') than when it is not. He makes no causal inferences. Sternberg (15) disagrees with Pawlow's assumption that appetite is the correlative of the secretion of juices in the mouth and stomach since (1) other things may occasion such secretions, (2) appetite is accompanied by other physiological phenomena and (3) these secretions, otherwise stimulated, do not occasion appetite.

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(1911) 8: 157-158 SYNÆSTHESIA

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In the course of presenting some of the abnormal and unusual features of adolescence, Lemaitre (3) devotes two chapters (pp. 15-74) to his findings in respect to synæsthesias. No unusual varieties are reported, though, naturally, the cases cited are not without individual interest. Photisms of one variety or another and more or less extensive in character are found, it is claimed, in about one-fourth of adolescents. The period seems, however, to be critical for these states, about one-half losing by the age of fifteen or sixteen the previously possessed photism or other form.

From an examination of thirty-seven cases of colored hearing a table is compiled (p. 23) showing the distribution of colors in respect to the vowels. The tabulation—useful only as a basis of comparison with similar collective accounts, and then only when it is remembered that the French sounds of the vowels are in question—shows "that *a* is usually red or white, that *e* is yellow, that *i* is white, that *o* is black, that *u* is blue with a leaning towards the green or the yellow."

The second of the two chapters devoted to synæsthesias recalls, and in some particulars completes, three cases described by the author in 1901, in a volume entitled *L'audition colorée et les Phénomènes connexes*.

Mercante (4) is also concerned with the distribution of synæsthesias among children and adolescents. Examining upwards of 900 pupils of both sexes, he finds that about 80 per cent. (the girls somewhat in excess of the boys) present some form of chromæsthesia. Such experiences the author regards as quite normal for the ages between 8 and 18. A marked concordance in the coloration of the vowels, and of certain words, leads the author to believe that the chromæsthesias develop through the presence of a common affective ground, the given vowel and the associated color being both natural and usual excitants of the same emotional tone.

Ferrari (2) reports a case of 'gustatory audition' communicated to him by a young doctor of science who was himself the subject. The hearing of proper names and ordinary nouns evokes tastes and

odors. Examples are given, but no data are accessible for interpreting the origin or development of the associations.

So far as the present writer is aware, this is the third case of this variety of synæsthesia to be reported. In 1907, only two months after my own report of a similar case, Ferrari published in the *Rivista* an extended account of the experiences of a young woman, Nerina U. Taste, smell, and food equivalents were given for two hundred proper names, which alone seem to have evoked the experience. In general Ferrari's case agrees with my own. It differs from it, however, (1) in that odor equivalents are present (my own subject was anosmic), and (2) in not revealing the wide range of response to sounds of all sorts. It is interesting also to note that Ferrari's subject, while not presenting a serious defect, showed idiosyncrasies of taste and smell, preferring bitter to sweet and being fond of odors (like that of petroleum) which are usually disliked. This case seems to be so little known that its mention here may, perhaps, not be out of place.

Miss Downey (1) relates a case of colored gustation found in a young man with a somewhat defective sense of taste. The taste-colors, which were clear and precise, "were definitely localized in the mouth, where of hallucinatory vividness, and had a uniform color-tone and persistence under constant conditions." The localization of the color in the mouth, while here not unnatural, is not unique, the present writer having recently found a similar localization in a case of colored hearing.

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AFFECTIVE PHENOMENA—EXPERIMENTAL

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The most extensive publication of the year was that of Weber (7). He studied the arm volume by means of the Lehmann plethysmograph. The volume of the ear was recorded by a capsule which fitted over

the ear and was connected to the registering apparatus. Changes in the abdominal vessels were tested with a small rubber bag inserted into the rectum and weakly inflated. Weber states that mental work, strain and shock gave a fall of volume of the arm and ear, and an increase in volume of the abdomen. Changes of level in the ear were more abrupt than those in the arm. Agreeable feelings and agreeably-toned emotions are said to be accompanied by rise of volume of the arm and ear and fall of volume of the abdomen; disagreeable states show opposite effects. A part of the stimuli for these results consisted of agreeable or disagreeable tastes, noises and problems; but most of the supposed effects were due to suggested stimuli during hypnotism. A stimulus will cause some reaction even as an unconscious process, but Weber believes that the suggestion in consciousness is the primary factor.

Electrical stimulation of different parts of the motor cortex of animals gave a rise of blood pressure, fall of volume of the abdomen and the ear, due to active constriction, and rise of volume of the extremities, due partly to active dilation. The use of this reaction is to send blood from the abdomen to the muscles concerned. The part of the motor cortex effective in different animals varies with the muscle-group most concerned in the mode of life of the animals. Similarly, Weber asserts, voluntary movement, or an idea of movement without actual movement, leads to rise of blood pressure, fall of volume of the ear and the abdomen, and rise of volume of the extremities, especially of the member most concerned in the intended movement. Many of these results were obtained during hypnotism.

Weber attempted to test these statements as to blood distribution by means of the Mosso balance. But he improved the method by making the board longer, and balancing the subject with the abdominal organs first on one side of the axis, then on the other. The movement of the writing-point was opposite in the two cases. Hypnotic suggestion was used again. The statement is that with ideas of movement, agreeable conditions, and sleep, the centre of gravity tends to leave the abdomen (the side on which it is placed becoming lighter); with other processes one gets the opposite result. The author obtained three curves, showing the influence of disagreeable stimuli upon the brain circulation. They are much obscured by movement, but he draws the conclusion that there is a decrease of volume and size of pulse.

The innervation of the cerebral vessels was studied by recording the arterial pressure and the brain volume in animals. After section