

the functions of the inner ear deserve passing mention. Alexander's is a succinct and comprehensive review of the facts and theories concerning the functions of the vestibular apparatus. Bárány's is a brief summary of his theoretical position discussed in extenso in another article.¹

Oppenheim (17) describes and discusses cases met with in his practice of permanent dizziness not assignable to objective causes. It differs from either cerebellar or vestibular dizziness and always begins with a marked attack, resists treatment, especially psychotherapeutic, and is probably not in the psychiatric sense a mental trouble, but is rather dependent on some still undiscovered irritation in the central nervous system. Friedländer (8) reports a case, however, manifestly hysteric in origin, but showing the same stubborn permanent dizziness already described by Oppenheim. Cruchet and Moulinier (5) gives merely a brief description of symptoms of aviator sickness.

Finally, Sternberg (19, 20), recurs anew in two articles to his already much exploited doctrines of the nature and functions of appetite. A third article (21) gives another of his remarkable discussions on *tickling feelings*. He attempts to define, chiefly on the basis of philological usage, the meaning and function of tickling in general and in particular. When philological analysis has done its best "erst dann," he thinks, "wird man zur Feststellung des Begriffes der Kitzelgefühle und zur Einsicht in das Wesen des Kitzels gelangen" (p. 109). Bis dahin—Geduld!

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SYNÆSTHESIA

BY PROFESSOR A. H. PIERCE

Smith College

A full and detailed account of the case of colored gustation reported in outline last year¹ is now available (1). It is abundantly shown that the subject—a young man of college age—has a defective sense of taste. Tastes seem to be recognized largely by tactual accompaniments and discriminated by their "feel" and by the color induced. Substances as different as cayenne pepper and quinine

¹ Cf. PSYCHOLOGICAL BULLETIN, 1911, 8, 158.

(both in solutions) are indistinguishable, both producing the same "feel" on the tongue and both inducing the same color—a dull orange-red. Furthermore, the behavior of the induced color is at times dependent upon the temperature of the solution. Plugging the nostrils reduced the intensity and persistence of the taste-colors. A reasonably definite correlation between taste-color tones and taste qualities was made out.

The genuineness of the synæsthesia and the sensational (rather than imaginal) value of the taste-colors is attested by (1) the constancy of the correlation just referred to, (2) the persistence of the induced color (sometimes for more than ten minutes), (3) its localization (in the mouth), (4) its independence of the subject's volition, and (5) the feelings of tension and dizziness when simultaneously experiencing a taste-color and fixating a colored surface.

The case of colored audition reported by Myers (3) is peculiar first in the fact that colors are induced only by tones,—timbre, intensity, and the pitch of the foregoing tone being conjointly influential. Tones below 600 vibrations per second give brown and orange colors; those between 600 and 12,000 give blue, changing to green; and those above 12,000 give a colorless gray. The subject is a man of thirty, unmusical.

This case stands in marked contrast with that summarized above, the induced color being neither sensory nor imaginal in character. The subject "insisted that his imagery was verbal or more often that his thoughts were entirely imageless." As a believer in "imageless thought" Myers finds no difficulties here.

The subject himself "regards his synæsthesia as the result of some 'sympathy' existing in him between auditory and visual experiences." Myers interprets this as analogous to the tendencies by which we speak of tones as "heavy, rounded or dull"; and in the fact that synæsthesias are more common among children he sees grounds for the view that "their origin may perhaps be ascribed to the persistence of a primitive stage in the differentiation and elaboration of sensations and in the development of their functional interrelation." Strong tendencies to association, combined with the "sympathy" referred to, would then be favorable to the formation of synæsthesias.

The paper by Medeiros-e-Albuquerque (2) is weak and unconvincing, with a quite unjustified title. The author finds that those who think only in Portugese associate the *u* of that language with the color black. This arises from the fact that *u* is the accented vowel of

the majority of Portugese words signifying black objects or ideas relating to black. This association is, admittedly, no true synæsthesia, but the author believes that it is only a matter of degree between these logical and spontaneous associations and genuine cases of colored audition.

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AFFECTIVE PHENOMENA — EXPERIMENTAL

BY PROFESSOR JOHN F. SHEPARD

University of Michigan

Three articles have appeared from the Leipzig laboratory during the year. Drozyński (2) objects to the use of gustatory and olfactory stimuli in the study of organic reactions with feelings, because of the disturbance of breathing that may be involved. He uses rhythmical auditory stimuli, and finds that when given at different rates and in various groupings, they are accompanied by characteristic feelings in each subject. He records the chest breathing, and curves from a sphygmograph and a water plethysmograph. Each experiment began with a normal record, then the stimulus was given, and this was followed by a contrast stimulus; lastly, another normal was taken. The length and depth of breathing were measured (no time line was recorded), and the relation of length of inspiration to length of expiration was determined. The length and height of the pulse-beats were also measured. Tabular summaries are given of the number of times the author finds each quantity to have been increased or decreased during a reaction period with each type of feeling. The feeling state accompanying a given rhythm is always complex, but the result is referred to that dimension which seemed to be dominant. Only a few disconnected extracts from normal and reaction periods are reproduced from the records.

The author states that excitement gives increase in the rate and depth of breathing, in the inspiration-expiration ratio, and in the rate and size of pulse. There are undulations in the arm volume. In so far as the effect is quieting, it causes decrease in rate and depth of