

DIZZINESS.

Ueber Nachempfindungen im Gebiete des kinaesthetischen und statischen Sinnes. Ein Beitrag zur Lehre vom Bewegungsschwindel (Drehschwindel). HANS ABELS. Zeitsch. f. Psychol., 1906, XLIII., 268-289, 374-422.

The impulse to the present study was found in observations and studies upon seasickness which the author made as a physician of the Austrian Lloyd. Seasickness has been looked upon as a form of movement dizziness and shows the same characteristics. The first facts to present themselves with respect to seasickness are the striking individual differences and the influence of habituation. These are given careful consideration by the author as points of importance in the whole subject of movement sensations with their after-sensations and of turning sensations after turning movements. 'Nur dieses Gefühl des Verwirrtseins bezeichnet der Sprachgebrauch als Schwindel.' The author holds that seasickness and movement dizziness are essentially of the same character and so reviews all the work that has been done upon movement sensations, after-sensations of movement, and illusions of movement to find an interpretation for dizziness in general. He criticises Mach and Breuer for holding that turning sensations of short duration can have after-sensations of long duration and repudiates the idea that dizziness can be due to a functional peculiarity of the vestibular apparatus or to a mechanical imperfection or incompleteness of the statal end organ. He reviews Jensen's experiments upon galvanic dizziness and shows that this is due alone to the long stimulation of the skull. His main contention is that only long durations of stimulus can have long after effects and correlates this with the after-dizziness from long rotations. This principle, he claims, is valid in the general physiology of the senses and takes Mach to task for employing special principles in his explanation of results obtained in the study of progressive acceleration. Progressive movements as well as continuous rotations produce exhaustion of the movement sensation just as continuous stimulation in other sensory fields. The up-push felt in the arm which has held a pail of water that has been allowed to flow out rapidly, reversed motion perceived in trains whose speeds are rapidly decreasing or in elevators coming to a sudden stop, and the sensations of heaviness after allowing the water to flow quickly from a bathtub, are explained by the fact that all motion is the result of opposing muscular tendencies and that under the unusual circumstances one side of the mechanism is fatigued and perhaps the other side is rendered hypersensitive by the long absence of the usual stimu-

lation. To progressive movement habituation has taken place in daily experiences, but not so for rotations. Hence the prominence of after-sensations in the latter as compared with the other. Habituations to rotation movements are possible and are found in experienced dancers and skilled skaters. The after-sensation from rotation comes only with long stimulation, — this he bases upon his own experiments with rotating human subjects and doves, — and cannot be due to the sudden or momentary shifting of the cupula as Breuer supposes or to the waving of the auditory hairs or ossicles with Brown. In this study of rotations he finds two sensation elements, the swinging sensations that give speed and mediate position of rotation axis, etc., and the sensation corresponding to angle acceleration which registers meaning, direction and change of rate. The latter is always of short duration. These sensations are usually combined in daily life, which furnishes only short turning movements, but under experimental conditions they may be separated entirely from one another. Lasting rotations are entirely abnormal and dissociate these elements by calling them out in different measures so that to the higher centers a complex of sensation elements are mediated that stand in unaccustomed and often opposing relations. After-dizziness never attains to the clearness of a real sensation as it should on Breuer's hypothesis. These two sensation elements have after-sensations, and it is to the unusual combinations of these in the higher centers that dizziness is due. The author rests his argument upon a very closely critical examination of the work of others and makes only a subordinate use of his own experimental studies. He scarcely satisfies the hope that he raises at the beginning by mentioning seasickness. The reader is led to expect some light upon the question of the disturbance of the vomiting center by the arousal of dizziness sensations. However, the work has been carefully done and one cannot help but be impressed with the strength of the argument, especially with the negative conclusion towards the hypotheses of Mach and Breuer.

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BODY AND MIND.

Leib und Seele : Darstellung und Kritik der neueren Theorien des Verhältnisses zwischen psychischem und physischem Dasein.
R. EISLER. Leipzig, Barth, 1906. Pp. 215.

The author takes up Dualism, Materialism, the Identity theory, Interactionism and Parallelism, giving an exposition and criticism of