

in Basel for measuring auditory acuity. It is the well known method of comparing the length of time that a tuning fork can be heard by a normal ear and by the ear to be tested. This method has been found satisfactory for diagnostic purposes.

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TACTUAL AND KINÆSTHETIC SPACE

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Cook and v. Frey (2) studied the influence of the intensity of stimulation on the values of simultaneous spatial thresholds of the skin, using, as the area of stimulation, the volar surface of the left forearm. Two sorts of apparatus were employed, by means of which stimuli of graded intensities and limiting different extents on the skin could simultaneously be applied under admirably uniform conditions. Between any two applications of stimuli there was usually an interval of 30 seconds. It was found that the spatial discrimination of two intenser stimuli was consistently easier than that of two weaker, and this with a range of stimulation from just perceptible to nearly painful intensities. The forearm threshold sank, indeed, to 2 cm. or less with intenser and rose to 6 cm. or more with weaker stimuli. Exceedingly important, however, for exact results, was a preliminary subjective equation of the sensations from the points stimulated, an equation that had occasionally to be repeated during the course of the experiments. Under the most favorable conditions attainable (intense stimuli subjectively equated on pressure points mediating similar sense-qualities), the absolute values of the simultaneous two-point threshold varied, with four subjects, from 1.5 to 3.0 cm. With unequal intensities of the two stimulations the threshold became greater, rising even to 8 cm. This influence of unequal intensities comes out with great clearness if two unequal extents, determined by three limiting points in a straight line, are compared; if points 1 and 2 limit the shorter extent, and points 2 and 3 the longer, an increase of the intensity of point 3 will make extent 2-3, even if objectively twice

as long as 1-2, seem the shorter. It appears, indeed, that two simultaneously given stimuli exert, in a spatial sense, an attraction effect on each other, for a comparison of extents occurs with greater certainty if given successively (1 sec. interval). The attraction is a function of intensity in the sense that the point less intensely stimulated appears displaced towards that more strongly stimulated.

Chinagli (1) discovered that if a circle of wood or other material, 5 mm. thick, and with any diameter smaller than 35 mm., is placed on the skin—preferably of the forehead—it is felt as a filled disc. Similarly with triangles, squares, etc. Furthermore, if a point within the circle was touched, verbal localization placed it outside the circle, but pointing localization within the circle.

Ponzo (3) gives a summary of articles by him already published in the *Memorie dell'Accad. delle Scienze di Torino*, serie 2, t. LX., 1909, and t. LXI., 1910, on the localization of tactual and pain sensations on the skin. Twenty-five different areas of the body were examined, in each of which ten specially sensitive points were marked and tactually stimulated with v. Frey's æsthesiometer. After each stimulation the subject pointed with a rod to the point stimulated, the extent and the direction of error being recorded. The error of direction was determined with reference to a constant axis. For pain Kiesow's æsthesiometer was used. It was found that the errors differed in both size and direction in the various areas, but were fairly constant for a given area. There was no stable relation between threshold-value and accuracy of localization, nor any decrease in accuracy with lower intensities of stimulation. Maximal accuracy appeared on the tip of the tongue, the cushion of the index finger and the middle of the lower lip; minimal accuracy in the costal region. The extent of the tactual errors corresponded well with those given by Weber. The accuracy of localization of painful stimuli proved to be as great as that for tactual. Finally, the results showed that for all the regions investigated most of the errors, as well as the greatest mean errors, were in the longitudinal direction.

Ponzo also reports two new instruments for cutaneous investigation. One (4 and 5) is a simple arrangement for investigating simultaneous spatial thresholds. It secures, particularly, quick variation or equalization of pressures and involves a device for registering any time differences in the applications of the two stimuli. With it the author secured average differences of less than 3 sigma.

The other apparatus (6 and 7) is likewise simple and is designed to secure rapid measurement of the extent and direction of errors in the localization of cutaneous sensations.

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SPACE ILLUSIONS

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Ponzo in his two papers (5, 6) gives a restatement of some facts and apparatus which he has previously published in other journals, and which were reviewed in last year's report. Schmidt (7) gives a translation and commentary of a lately discovered Latin manuscript of Kant which consists mainly of notes, partly disconnected, used in a disputation. His various arguments, possessing but little psychological interest, are directed against the thesis of his opponent that the sense illusions and the dominance of the perceptual furnish the clue for the interpretation of much in the literature of early peoples.

Benussi's work (1) on solidity reversals of ambiguous figures was instigated by that of Becher and de Boer reported last year. The time of cognition reactions for the perception of solidity was taken for one observer for four positions of a cube. One type of solidity prevailed for each position. The reaction times varied greatly for the four positions. Practice decreased the times but in an irregular manner. Tachistoscopic exposures with many subjects for two intervals demonstrated that the frequency of the solidity perception