

again. The speaker has made experiments with tuning-forks, recording the vibrations of the arms by means of brushes writing on a rotating drum; in another series of experiments, which are not yet concluded, he has photographed the vibrations at equal intervals of time. The result of his work is that the vibrations diminish in geometrical progression, thus according with theory.—Dr. Wertheim gave an account of his experiments to determine the number of visual units in the central portions of the retina. In continuation of the experiments of Dr. Claude du Bois-Reymond, who has determined the number of visual units in the fovea centralis and found them equal in number to the cones, Dr. Wertheim, employing the same method, has determined the number of visual units to a distance of 2.5 millimetres from the centre. A sheet of tinfoil pierced with uniform holes was illuminated from behind, and then the distances were measured at which the holes began to be just visible as separate objects, as their image was made to fall on parts of the retina *successively* further and further towards the periphery. After having found in the fovea centralis the same number of visual units as had Dr. du Bois-Reymond, he then observed that their number decreases rapidly towards the periphery up to a distance of 1.5 millimetres, then remains constant for a short space, then diminishes again rapidly, and then gradually as far as the limits of the retinal area which he investigated. The speaker found that the first rapid decrease extends as far as the limits of the macula lutea. The anatomical statements respecting the limits of the yellow-spot and the number of cones outside this area did not permit of his drawing any conclusion, other than the above, from the optical experiments. The same numbers were obtained when red and green light was used.—Dr. Goldschneider has carried out a series of experiments to test Leyden's theory that ataxy, when not of central origin, is caused by injuries to centripetal nerves. By passing strong electric currents through the first phalanx of one finger he anaesthetized the second and third phalanx, and then found that the movements of flexion and extension of the finger no longer gave a regular curve of rise and fall as traced by the tip of the finger: the movements executed by the finger were irregular, sometimes going beyond and sometimes falling short of the desired extent. The sensation of passive movement was also considerably lessened. The speaker hence concluded that the ataxic movements are caused by the interference with the sensations arising from passive movements of the limbs. He added to this a hypothesis as to the nature of ataxy and the seat of the muscular sense in the limbs.

July 27.—Prof. Munk, President, in the chair.—Dr. Sandmann spoke on respiratory reflexes originating in the nasal mucous membrane. In order to study the possible connexion between asthma and diseases of the nose, which has been so often supposed to exist, the speaker has made experiments on the respiration in rabbits and cats whose nasal openings had been completely occluded. In addition to confirming the phenomena which had been already described by earlier observers, he found that the changes in volume of the thorax were the same as in normal animals, whereas the intrathoracic pressure was considerably increased when breathing was carried on entirely by the mouth; similarly the respiratory undulations of the blood-pressure tracing were increased in amplitude. He next investigated more closely the respiratory reflexes which originate in the nasal mucous membrane; of these three are known—namely, inhibition of respiration, sneezing, and coughing, as a result of stimulation of the nose. Inhibition of respiration was observed to occur, according to the strength of the stimulation, either in the phase of expiration, or of inspiration, or merely as a more pronounced expiration. Sneezing was brought about by tickling the nasal mucous membrane, and was found to consist of a deep inspiration with simultaneous closing up of the pharynx and mouth by the application of the tongue to the palate, followed by an explosive expiration. When the stimulation is slight, only the deep inspiration is produced; if the stimulation is strong, the deep inspiration is followed by a somewhat lengthy inhibition of the same, which is frequently accompanied by slight expiratory movements; when the stimulation is of moderate strength an ordinary sneeze is the result. After section of the phrenic nerves the deep inspirations were no longer observed. Dr. Sandmann, by section and removal of the mucous membrane in rabbits, has further examined the various regional areas of the same, and found that sneezing can only be produced by tickling a limited area of the mucous membrane. On the rabbit this

area is found in the entrance to the nose on the anterior surface of the lowest nasal muscle; but in addition to this place, the same reflexes may be produced by stimulation of the front part of the septum and roof of the nasal cavity. Sneezing cannot be produced by stimulation of any other portion of the nasal mucous membrane. In man the region of the posterior nasal openings is also connected with the reflexes involved in sneezing in addition to the regions mentioned above. An anatomical investigation of the areas whose stimulation leads to sneezing showed that they are supplied entirely by the ethmoid nerve. Stimulation of this nerve in the orbit was followed regularly by sneezing, which could therefore be produced to a certainty by stimulating the trunk of the nerve. The third kind of respiratory reflex—namely, coughing as a result of nasal stimulation—could not be experimentally produced in the cats and rabbits used in these experiments.

#### BOOKS, PAMPHLETS, and SERIALS RECEIVED.

The Distribution of Rain over the British Isles, 1836: G. J. Symons (Stanford).—First Lessons in Science: Dr. J. W. Colenso (Ridgway).—A Treatise on the Principle of Sufficient Reason: Mrs. P. F. Fitzgerald (Laurie).—Prolegomeni di Filosofia Elementare, Terza Edizione (Torino).—Bulletin de l'Académie Royale des Sciences de Belgique, No. 6, 1887 (Bruxelles).—Journal of the Royal Microscopical Society, August (Williams and Norgate).—Bulletin of the California Academy of Sciences, vol. ii No. 6.—Boletín de la Academia Nacional de Ciencias en Córdoba, Junio 1886 (Buenos Aires).—Journal of the Anthropological Institute, May and August 1887 (Trübner).

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