place. By means of appropriate variations of the conditions of the experiment it was possible to inhibit a stimulation above the reacting threshold (which was therefore effective) by a second stimulation below the threshold. This discovery furnishes another example of inhibition of the sort already known in the so-called Wedenski phenomenon, being an inhibition in a peripheral nerve which is wholly analogous with the sort encountered in the central nervous system. More important than the proof of the simultaneous summation that of the summation of successive stimuli, each one of which alone was below the reaction threshold. The weaker stimuli following at intervals when continued for some time gradually produced excitation, just as in the central nervous system. These phenomena of summation observed in the peripheral nervous system are qualitatively like those observed in the central nervous system.

Stewart, F. W. THE DEVELOPMENT OF THE CRANIAL SYMPATHETIC GLANDS IN THE RAT. [*Journ. Compar. Neurol.*, 1920, XXXI, 163 (36 Figs.).]

Summary: (1) Large numbers of cells of vagus origin reach the cardiac, intestinal, gastric, tracheal, œsophageal, and possibly the pharyngeal plexuses.

(2) Cells of Glossopharyngeus origin give rise to certain small ganglia of the pharyngeal wall, the posterior third of the tongue, the tympanic plexus, and, in addition, to the otic ganglion.

(3) The sphenopalatine ganglion is a ganglion belonging developmentally to the ramus palatinus VII (great superficial petrosal nerve).

(4) The sphenopalatine and otic ganglia are therefore developed from cells migrating along these nerve trunks which, in the adult, carry preganglionic fibers to the ganglia.

(5) Circumstantial evidence favors the interpretation that the submaxillary and sublingual ganglia, together with certain small ganglia of the anterior two-thirds of the tongue, are of facialis origin, the path of migration being the chorda tympani.

(6) Neuroblasts giving rise to the ciliary ganglion reach the orbit by way of the ramus ophthalmicus V.

(7) The ganglion cells of the nervus terminalis originate in a proliferation of cells of the olfactory sac.

(8) Ganglion cells of the carotid plexus and its allied plexuses, together with a portion of the cells of the tympanic plexus, arise as extensions forward from the superior cervical sympathetic ganglion. [Leonard J. Kidd, London, England.]

Parhon, J. THE CARDIO-RESPIRATORY CORRELATION IN NEUROPATHOLOGY. [*L'Encéphale*, 1920, March, Vol. XV, p. 185.]

Inspiration in breathing normally causes the formation of a virtual vacuum in the thorax and thus the depletion of the blood coming from the brain and of the venous blood generally is facilitated. Whenever the

inspirations are not sufficiently complete, there is, beside the sensation of oppression, or need of air, passive venous congestion and, consequently, an augmentation of the intercranial pressure. This tension, the author thinks, may contribute to the explanation of certain pathological phenomena on the part of the nervous system, not only of the psychic disturbances in those suffering from cardiac but also many other nervous factors (from anoxemia, auto-intoxication, etc.), and among them, in some cases at least, fascicular tremors, certain sensation of neurasthenics, and migraines. In a patient observed by the author there could be no doubt of the connection between the nervous phenomena and the cardio-respiratory disturbances. This was a case of a young man who was subject to fascicular tremors in various muscles of the body (quadriceps, masseter, orbicularis oris, biceps, etc.), which were at time of such force that they resembled veritable clonic spasms. The patient had manifested respiratory insufficiency from infancy, a sequel to bronchial pneumonia. The contractions and muscular spasms first made their appearance after an attack of scarlatina. Later at puberty he had suffered from a feeling of oppression in the head and from phobias and obsessions. The author calls attention to the fact that these psychic disturbances may stand in close relation with the respiratory disturbances or perhaps with cardio-respiratory affections. Evidences of this are the facts that they develop from a neurasthenic feeling of tension in the head; they evolve on an affective foundation of anxiety; they are frequent in individuals suffering from Basedow's disease in whom anxiety is a nearly constant symptom and in whom there is also often diminution of respiratory amplitude. The author believes that the muscular spasms were due to irritation of the motor cortical centers by congestion (perhaps by microscopic hemorrhages) and to the acidifying of the blood and fluids accompanying anoxemia. Later the patient developed extrasystoles which the author is of the opinion stood in close connection with the respiratory difficulties. Neither the contractions of the voluntary muscles nor the extrasystoles appeared when there was sufficient respiratory amplitude. Psychic irritation caused the extrasystoles but with these psychic irritations there were also disturbances of respiration and of these the psychic excitement really seemed to be the conscious translation. The author, who has long held that respiratory modifications play an important rôle in affective phenomena, as a further example of the relation between cardio-respiratory function and nervous states now cites migraine, which he considers due to intercranial hypertension and venous stasis. The therapeutic effects of menthol is explained by the fact that more ample respirations are reflexly produced by it. [J.]

Naville, F., and Brüttsch. HEMATOLOGY IN NEUROLOGY. [Schweizer Archiv f. Neurol. u. Psychiat., Vol. IV, No. 1, p. 88.]

The authors call attention of neurologists to a cause of vascular and circulatory disturbances of the brain and medulla which is frequently