

metrical nodding movements. The attacks of spasm are paroxysmal, and are of variable duration, lasting from a few minutes to a number of hours. They may be very severe, tossing the head from side to side in a terrible manner, and may be almost continuous, involving also the muscles of the face, of mastication, and of the shoulder. Sleep usually arrests the movements, and is quiet and undisturbed, although it may be delayed, and sometimes entirely prevented. The paroxysms are excited by any kind of irritation, as of talking, mental excitement, anger, and are increased by the attention given to the spasms by others. As a necessary result, the wild, disorderly, and very strong movements exhaust the muscles. In the course of the paroxysms, speech and mastication are prevented. The unpleasant condition of these patients and the nervous disorder probably associated with it slowly bring about a mental change. These patients are depressed and gloomy, sometimes suicidal, and, in the further progress of the case, epilepsy, paralysis, or insanity may be a result.

Treatment.—There is little to encourage therapeutic effort, and partly because the origin remains obscure. Those cases brought on by exposure of the neck to draughts of cold and damp air are the most remediable. If there be a source of reflex irritation which can be removed, as worms, indigestion, or uterine disease, the muscular disorder may be readily cured if treated in time. When there are intra-cranial lesions, or if the case be chronic, and occurring in the neuropathic constitution, the treatment is in vain. The best results are obtained from the constant galvanic currents, stable applications, and by applications to the sympathetic and to the spine. Next in efficiency is the hypodermatic injection of morphine, if possible, into the muscles affected. The injections of arsenic should be tried in doubtful cases. The warm pack should be steadily worn at night, and douches to the cervical spine applied warm or cold, according to the results. The actual cautery has been used with success in a few cases. In that form of *torticollis* in which the muscles assume a condition of tonic spasm, they are fixed in a permanent position by contraction. If the sterno-cleido-mastoid is affected, it stands out prominently and is enlarged and rigid, and the head assumes a characteristic attitude, the chin turned away, and the occiput brought down and forward toward the clavicle. When the trapezius is alone affected, the head and shoulder are approximated, and the anterior border of the muscle forms a prominent, rigid swelling. The affected muscles have a sore, tired feeling, and are tender to the touch when the affection is recent. The antagonistic muscles after a time undergo atrophy, and hence the overacting muscles are aided in maintaining the fixed position of the head. In young spines a permanent curvature of the cervical part takes place, and the features accommodate themselves to the changed position of the head in a most remarkable way. The bones

of the face undergo a slow transformation to permit the features to assume the new relations. In this disease it is highly important to undertake the treatment before the deformity becomes permanent. Electricity is entitled to the first place as a remedy. There are two methods of application to be employed. Stable applications are to be made to the muscles in a state of spasm, and faradic currents to the antagonistic muscles. Warm packs, massage, and gymnastic training are useful. Surgical treatment is necessary in chronic cases.

SPASM OF THE DIAPHRAGM—SINGULTUS—HICCOUGH.

Pathogeny and Symptoms.—This malady consists in a recurring spasm of the diaphragm; there is first a full expiration, then a sudden inspiration, accompanied by a high tension-sound, caused by a spasmodic closure of the glottis. It is often present without having any significance. It is a symptom of certain kinds of indigestion, and is present only during the stage of digestion. Distention of the stomach may cause it. Hepatic diseases—peritonitis, chronic ileocolitis—are maladies during the course of which hiccough may come on, especially in the collapse which ushers in death. It is a symptom of irritation of the respiratory center, and of various diseases of the central nervous system, and is one of the manifold forms in which hysteria manifests itself. The worst case ever seen by the author occurred after a severe attack of hepatic colic. When the paroxysms are protracted and the hiccough is frequent, very considerable suffering is the result. The hiccough may occur as often as one hundred to the minute, and the paroxysms may continue for some hours or days, returning from time to time during several years. The attacks may have a certain rhythm, three, six, or other numbers occurring in succession, then an intermission. When a severe paroxysm comes on, severe pain is felt in the epigastrium, the respiration is disturbed, eating is difficult, and sleep may be prevented.

Treatment.—A strong mental impression or a draught of very cold or very hot liquid will sometimes succeed in arresting hiccough. Electricity is usually very successful. In the severe case just mentioned the author arrested the spasm instantly, after all kinds of remedies, including galvanization of the phrenic, had been tried in vain, by sending a strong faradic current through the diaphragm just as the spasm was about to occur. The inhalation of ether, of nitrite of amyl, and the injection of pilocarpine, have all promptly succeeded.

PARALYSES OF THE OCULAR MUSCLES.

Pathogeny and Symptoms.—Paralysis of the muscles of the eye is a symptom rather than a disease. Rarely does a case happen in which

the paralysis is due to rheumatic inflammation. More frequently penetrating wounds, contusions, and fractures, are causes. The secondary paralyzes are more numerous than the primary. Diseases of the brain, such as cerebral hæmorrhage, tumors so situated as to compress the nerve-trunks, affections of the spinal cord, as posterior spinal sclerosis, and the paralysis following diphtheria, are the most influential causes. When the muscles are weak, the movements of the ocular globe are affected, a fact which may be made apparent by comparing the sound with the impaired eye; the limit of rotation will be seen to be less, and the obvious result is strabismus. Before this is apparent by ordinary inspection, the patient complains of diplopia (double vision). Or there is confused double vision, the patient being affected only in certain parts of the visual field. The secondary deviation of the sound eye is a very characteristic sign. "The field of vision is displaced in the direction of the action of the paralyzed muscle," which leads to erroneous perception of the position of objects. The disturbances of vision caused in this way induce giddiness and more or less pain. Covering the eye prevents, of course, the formation of a double image, and thus affords some relief. When the *motor oculi* is paralyzed, there is *ptosis* (dropping of the eyelid), and the movements of the eye downward, inward, and upward, are lost. The pupil is dilated and motionless because of the unopposed action of the sympathetic, and the power of accommodation to near and distant objects is very much lessened. As the external rectus and superior oblique continue in action, the eye becomes fixed in the direction downward and outward. The eye is usually prominent because of the paralysis of the straight muscles, allowing the globe to glide forward. There is double vision, and, as the field of vision is falsely projected in every direction, there is great disturbance of visual perceptions, and consequently giddiness, so that the eye is ordinarily kept closed. In paralysis of the abducens, the external rectus muscle is unable to move the eye outward, and there is consequently convergent strabismus.

Course, Duration, and Termination.—There are very great variations in the course of these affections, as they are dependent on various causes. The rheumatic affections may be regarded as curable with comparative facility, but those examples due to intra-cranial lesions, unless syphilitic, pursue the course of the original disease, and are incurable. The accompanying symptoms are of great importance in coming to a conclusion as to the seat and character of the local disease.

Treatment.—If syphilitic, rheumatismal, or plumbic lesions be the cause, the treatment appropriate to these diatheses should be carried out. In the absence of any specific cause, a course of the iodide of potassium should always be undertaken. The most important remedy, and one from which most striking results are obtained, is electricity.

Labile applications of galvanism are the most effective—the anode placed on the mastoid, and the cathode passed over the eyelids. The current must be strong enough merely to cause movements of the facial muscles, and the length of the sitting should be about three minutes. The sympathetic may also be galvanized in the usual way. The faradic current, which is greatly more painful, may be used instead in some cases—one pole on the temple, and the other, covered with soft leather, to the conjunctiva at the situation of the paralyzed muscle, if possible.

PARALYSIS OF THE FACIAL NERVE—FACIAL PARALYSIS.

Causes.—Exposure to a current of cold air, directed against the main divisions of the nerve in front of the ear (*pes anserinus*), is the most usual cause, and of the simplest variety of the disease. Such exposure acts by exciting some inflammation of the neurilemma; in the Fallopian canal serous and occasionally plastic exudation occurs and compresses the nerve. Injuries to the nerve in front of the ear are very common, but the most usual cause, next to cold—the so-called rheumatic inflammation—is disease of the middle ear. Syphilitic deposits, gummata, etc., may invade the nerve before its entrance into the canal, and also various diseases of the basal ganglia, tumors, exostoses, etc. Again, facial paralysis occurs with hemiplegia, or it may be a crossed paralysis in disease of the *pons Varolii*.

Symptoms.—No disease is more distinctive than facial paralysis. The affected side is perfectly blank, motionless, without wrinkles, the corner of the mouth depressed, the eye wide open, and the tip of the nose and the whole side drawn over to the healthy side, which is more strongly marked by furrows and wrinkles than before. This condition of the muscles may occur suddenly: the patient, on looking in the mirror in the morning, is astonished and alarmed at the change; or, feeling an odd sensation in the lips and tongue, he attempts to expectorate or whistle and finds he can not use his lips properly. There may be premonitory symptoms for some hours, even a day or two before the attack, consisting of numbness and tingling of the lips, a strange taste, acid or metallic, pains in the face or ear-ache, noises in the ear, or there may be present an otorrhœa. Again—and this is especially true of disease of the middle ear—the paralysis may develop slowly, one group of muscles, then others, becoming paralyzed, and, when complete, all of the muscles innervated by the seventh nerve are affected. When this occurs, no movements can be effected by these muscles. The eye remains open; the conjunctiva inflames in consequence of the particles of dirt which alight and adhere; there is a profuse flow of tears; in attempts to close the eyes, the upper lid falls and the globe rotates upward and inward, but the lids do not approximate, and hence the eye remains open, and in time the lower lid becomes somewhat everted;

the forehead can not be corrugated. The corner of the mouth can not be elevated, the lips can not be pursed up in the attempts to whistle, and in smiling the affected side remains motionless, while the sound is acting strongly. The saliva escapes from the mouth, and the labials can not be pronounced, whence the speech is rather mumbling and indistinct. Mastication is difficult and the alimentary bolus accumulates in the cheek of the paralyzed side. Not unfrequently the sense of taste on one side of the tongue is abolished, and the secretion of saliva lessens. When this is the case, the chorda tympani, which Schiff has shown is the nerve of taste to the anterior half of the tongue, is affected, and it therefore follows that the seventh is damaged at the point of origin of this nerve. The uvula is often affected also, and hangs paralyzed, deviating toward either side. When this organ is affected, the speech is nasal, swallowing is difficult, and liquids come through the nose. This paralysis of the uvula is necessarily due to implication of the superficial petrosal nerve. The ear is usually unaffected, although noises are heard. The sensibility of the paralyzed side is normal. The reflex movements are entirely abolished when the disease occupies any part of the trunk of the seventh from its origin outward. In case of hemiplegia the reflex excitability is preserved. In the mildest cases the electro-sensibility and contractility are perfectly normal. In the more severe cases the muscles may not respond to a faradic current, yet do respond to a slowly interrupted galvanic current; but the nerves themselves lose their excitability to both currents during the period of regeneration. The muscles may ultimately lose their galvanic excitability when they have undergone advanced changes. When this is the case, the prognosis is unfavorable.

Course, Duration, and Termination.—When the external branches of the seventh only are affected, and by such a simple cause as exposure to a current of cold air, the duration will be short, and recovery effected in two or three weeks. The more severe cases may require twice the time of the former. In those cases characterized by loss of faradic and retention of galvanic excitability of the muscles, the duration will be several months, even a year may elapse before restoration. In these cases, after a time, the muscles become rigid and retract somewhat, and they may be affected by spasmodic contractions resembling tic. In traumatic paralysis, the amount of recovery depends on the extent of injury to the nerve. Usually restoration in the most favorable cases is incomplete. The same observations may be made of paralysis from pressure of the nerve, the degree and curability of injury determining the result.

Diagnosis.—The diagnosis is reached by mere inspection, but to ascertain the seat of the injury to the nerve is more difficult. Whether peripheral or central is arrived at by attention to the following points: in peripheral paralysis, the eye is wide open even in sleep, and reflex movements of the lids are abolished, which is not the case

in cerebral paralysis; the abolition of faradic and the retention of galvanic excitability and the degeneration of the muscles—symptoms not present in the cerebral form; in the latter are observed various cerebral symptoms. The position of the disease in the trunk of the nerve may be determined as follows: paralysis of the muscles of the face, without involving taste, indicates with other symptoms disease of the nerve anterior to the origin of the *chorda tympani*; paralysis of the muscles, no reaction to faradic but response to galvanic current, paralysis of uvula, indicate lesion of the nerve at the origin of the large superficial petrosal nerve which goes to the spheno-palatine ganglion. When there is alternating paralysis, the lesion is most probably in the pons. If partial paralysis exist, the velum palati being affected at the same time, and if the reflex and electrical excitability are preserved, the lesion is in the opposite hemisphere of the brain or its crus.

Treatment.—The cause of pressure on the nerve within the cavity of the cranium, or disease of the ear, should be removed if practicable. In all doubtful cases a course of iodide of potassium should be prescribed. If the attack is of the rheumatic variety—so called—blisters to the mastoid and the internal use of pilocarpine are the most effective measures. The application of electricity, the galvanic current preferably, should be begun at once, and continued faithfully until a cure is effected or discovered to be unattainable. The application should be made by one pole—the anode—on the mastoid, and the cathode passed over the terminal filaments of the nerve as distributed to the muscles.

VASO-MOTOR AND TROPHIC NEUROSES.

HEMICRANIA—MIGRAINE.

Definition.—By the term *hemicrania* is meant a unilateral pain in the head, irregularly periodical, and accompanied by nausea and sometimes vomiting, and excited by certain reflex disturbances. By the French writers it is termed *migraine*, which has been naturalized to a large extent in our country, and it is known in common language as *sick-headache*.

Causes.—Regarded by Romberg as an hyperæsthesia of the brain, the localization of the disturbance in the vaso-motor system was first distinctly affirmed by Du Bois-Reymond, who maintained that the cause of the affection is a contraction of the arterioles on the affected side of the head—a fact determined by observation on himself. An opposite view of the state of the sympathetic was taken subsequently by Möllendorff, who maintained that the vessels are relaxed. As is often the case, the truth probably lies between these extremes, as Eulenberg