

and to what a pitch the humbug and impudence were carried may be seen from the composition of some such remedies, for instance, the epilepsy powder of the Institute for Deaconesses in Dresden, which consisted of charred bone of magpies which had to be shot at some time during the twelve nights following Christmas, and again from the epilepsy powder of Wepler, which was nothing but charred and pulverized hemp thread (cf. Richter, *Das Geheimmittelunwesen*, Leipzig, 1872, pages 15, 16).

A new era in the treatment of epilepsy—that is, of the attacks—was initiated when Locock in 1853 recommended bromide of potassium, which obtained a wide acceptance through the efforts of Legrand du Saullé. Its power of diminishing the reflex irritability and of lowering the blood pressure in the brain has placed it first among the antispasmodics, and to-day it has to be regarded as the best and most important medicine in the treatment of epilepsy. In order not to be disappointed, however, in our expectations, it is necessary that we should be familiar with the proper regulation of the dose and with certain unpleasant effects which are apt to arise in the course of the treatment. The small and moderate doses of 0.5 to 4 grm. a day (grs. viij to ʒj) formerly used are generally ineffectual. It is necessary to employ much larger amounts, which are best given in one dose. It is, moreover, better to combine the three bromides, viz., the bromides of potassium, sodium, and ammonium, in equal parts than to give bromide of potassium alone. The minimum daily dose for adults in cases of pronounced epilepsy is eight grammes (ʒij), and we should follow Mendel, who advises that it should be taken in valerian tea immediately before going to bed (potassium bromide, ammonium bromide, $\bar{a}\bar{a}$ 2.5 (grs. xxxviiij); sodii bromidi, 3.0 (grs. xiv). For children and young people up to sixteen years of age the daily dose should be half a gramme (grs. viij) for every year. If the two drachms are not sufficient—that is, if an attack still occurs now and then—the dose may be increased to ten or twelve grammes (ʒijss. to ʒiij), and this continued until four or five hundred grammes or from six to nine ounces are taken.

In this way I have treated hundreds of epileptics in private as well as in dispensary and hospital practice, and have let slip no opportunity for observing the action of the bromides. This action is by no means the same in all cases. There are people

in whom an idiosyncrasy against the medicine rapidly develops, so that it is impossible for them to take it any more. It nauseates them and may cause vomiting, and after repeated unsuccessful trials to resume the treatment we have to discontinue it entirely. In other instances the desired effect on the attacks may show itself; but after a few weeks the patient begins to complain of general bodily and mental feebleness, a constant desire to sleep, some loss of memory, and other symptoms, so that the dose has to be diminished. At the same time, sometimes without these symptoms, an eruption on the skin appears, more especially an extensive, obstinate acne distributed over face, trunk, and extremities, which is most distressing, especially to young female patients. I have seen this eruption particularly after the prolonged use of small doses, and have also seen it disappear comparatively rapidly under the use of mild laxatives and the administration of arsenic in the form of Fowler's solution. Finally, cases come under our notice in which bromide, no matter in what form or dose it be given, is entirely without effect. The attacks occur just as they did previous to the administration of it. Here we have, of course, again to suspend the treatment, more especially if symptoms of intoxication appear in addition to the continuance of the fits. If we wish to express the effects of bromide in epilepsy by percentages, we could say that in about ninety per cent of all cases the paroxysms diminish in number and violence, that in about as many signs of bromism appear which render necessary a diminution of the dose or gradual suspension of the medicine. In from two to three per cent of all cases bromide is borne so badly that it has very early to be discontinued.

If it is established beyond doubt that the bromides exert a favorable action, we must insist upon their prolonged use for months and years. To add some variety to the treatment they may be combined with belladonna and pills may be ordered which contain both. If every evening two centigrammes (gr. $\frac{1}{3}$) of belladonna and two grammes (grs. xxx) of bromide are given, about the same results are obtained as with eight grammes (ʒij) of bromide alone. [℞ Extr. bellad., 0.5 (grs. vijss.); pot. brom., sodii brom., ammonii brom., $\bar{a}\bar{a}$ 15 (ʒss. circ.); pulv. et succ. liq., $\bar{a}\bar{a}$ q. s. ut. f. pil. No. 50. Signa: One to two pills in the evening.] When the action of the bromide gradually becomes lessened owing to the establishment of a tolerance, the administration of belladonna is also indicated,

and it may then be given in the form of Trousseau's pills. (℞ Extr. bell., Fol. bell., āā i.ō (grs. xv), succ. q. s. ut. f. pil. No. 100. Signa: One to two, later three to four, or even six pills, in the evening.)

Compared with bromide and belladonna, which, according to our opinion, are the only reliable drugs to be used in the internal treatment of epilepsy, the medicaments which have been recommended of late years—curare (considered to be ineffectual by Bourneville), antipyrine by Beaumetz, tinct. simulo (the fruit of *Capparis coriacea*), which has been used by White—do not play any important rôle, and only deserve a trial in desperate cases. With my trials with borax, which has recently been so often recommended, I have been somewhat disappointed. On the other hand, amylene hydrate, recommended by Wildermuth (cf. lit.), must be given a trial in cases of distressing bromism or if the attacks increase to an alarming extent. The watery solution of Kahlbaum's preparation, in the proportion of one to ten, is the best to use in doses of from twenty to forty grammes (3v to 3x)—i. e., two to four grammes (3ss. to 3j) of the drug itself. It may be given in wine or water or in a glass of beer, well shaken up, and from five to eight grammes of the drug (3jss. to 3ij) may thus be used daily. Flechsig (Neurol. Centralbl., 1893, 7) has recommended extr. opii. 0.2–0.3 p. d. (3–4½ grains) for six weeks, followed immediately by large doses of the bromides. I have no personal experience with this treatment.

Surgical interference has also been resorted to, at first with the view of influencing or diminishing the amount of blood in the brain. Several times the carotids have been ligated, and two cases thus treated were reported as completely cured (Hasse, Krankheiten des Nervensystems, p. 297). Owing to the great difficulties of the operation and the grave responsibility which the physician takes upon himself, this measure will only in exceptional cases be made use of. With bleeding, strong revulsives to the skin, such as Autenrieth's ointment to the shaved head, moxas, setons, blisters, and purgatives, possibly the same results can be obtained.

More recently both vertebral arteries have been ligated (von Baracz, cf. lit.). In my clinic the ligation of one vertebral, the right, was performed several months ago by Janicke without any noticeable effect upon the frequency or the severity of the attacks; hence the patient was not willing to submit

to the ligation of the other. The operative treatment of traumatic epilepsy aims at the removal of bone splinters which press upon and injure the brain cortex; but the operation should only be performed, as von Bergmann holds, if the convulsions constantly occur in the same groups of muscles and extend in a characteristic manner, or if transient hemipareses occur. At the operation the affected area of the cortex has to be carefully excised. If the attack begins like a flash without an aura and is associated with opisthotonus, etc., operative measures are contraindicated. Neurotomy of the sympathetic, a procedure described by von Jaksch (Wien med. Wochenschrift, 1892, 16, 17), has produced a cessation of the attacks for several months in a number of instances; but we do not know whether it is capable of bringing about a permanent cure.

Marshall Hall's advice to perform tracheotomy, on the ground that the spasm of the glottis is productive of the asphyxia and the clonic spasm, is purely and entirely of historical interest. The operation has been performed several times without, of course, the least benefit to the patient. The same may be said of the cauterization of the glottis with nitrate of silver, suggested by Brown-Séquard, which has been justly condemned in such cases.

In connection with the surgical treatment we should mention the application of strips of cantharidal plaster around the forearm or lower leg in which the motor or sensory aura occurs. Only when the aura constantly appears in the same member can any success be expected from this measure, which has been recommended by Buzzard. The plasters must remain on for a considerable time. Following the advice of Buzzard, I have ordered the application of these plasters in some cases, without, however, having been able to see any good results. In one instance of partial epilepsy a transfer was produced by the application of the plaster (Hirt, Neurol. Centralblatt, 1884, 1).

Finally, we can hardly be surprised that attempts have been made to combat epilepsy by electrical treatment. Unfortunately, the results with this have been even less encouraging than those from internal medication. Neither the attacks themselves nor the so-called "epileptic change in the brain," the nature of which, as we have above stated, is still obscure, have been influenced by it in any way. The constant current was employed and the sympathetic galvanized by passing the cur-

rent from one mastoid process to the other, and attempts were made to influence the cerebral hemispheres, and more especially the motor regions, according to Erb's method (Erb, Handbuch der Electrotherapie, p. 581). In other cases the current was passed through the lobes of the thyroid gland, as Sighicelli (Riv. sperim. di freniatr, 1888, vol. xiii, 3) has more recently done, but in none of them could any lasting success be remarked. No better results have been obtained with the faradic current in all its different modes of application.

Although with all our treatment we are practically powerless against the disease, it would be very wrong to assume that to the epileptic the physician can be of no use and can not improve his condition in any way. On the contrary, there is hardly another class of patients affected with nervous diseases who require so much a physician's advice, and hardly another class who have to be so carefully watched by him. Above all, attention has to be paid to the general condition. The bowels must be kept regular and the skin and muscles stimulated to their proper activity by appropriate cold-water treatment and home gymnastics. The patient should constantly be warned against every kind of excess. Too large a supper, a few glasses of wine or beer taken too quickly, any indigestible food, excesses *in venere*—all these may give rise to an attack, the consequences of which are incalculable. To guard against these, therefore—in other words, to employ prophylactic measures—is the chief task of the physician who is taking charge of an epileptic. Besides this, the bromides, or, if these are not suitable, the next best treatment, should be begun. Finally, care must be taken that the patient does not hurt himself during the fit, and against this he should be protected as well as possible. All tight clothing must be removed and all ordinary emergencies provided for. A regular treatment of the attack itself we do not possess, and all attempts to cut it short should be avoided. Even inhalations of amyl nitrite, which O. Berger suggests, chloroform, and similar remedies are only allowable if administered with the greatest caution, and it would be better still to discard them entirely.

Note.—Eclampsia is one of those terms which up to the present do not convey to our minds any clearly defined clinical or pathological picture. It is a term under which are compre-

hended the most heterogeneous conditions which have not the least connection with each other. If a woman during pregnancy or during parturition without any appreciable cause loses consciousness and falls into convulsions, which may recur several times, and which frequently lead to a fatal issue, we speak of eclampsia gravidarum or parturientium. If children, as not uncommonly occurs, have paroxysms, consisting of distortions of the face, trismus-like clinching of the teeth, general spasms, and more or less marked disturbances of consciousness, we designate the affection as eclampsia infantum, and use the same term if at the onset or in the course of acute diseases or certain intoxications (more particularly lead poisoning) attacks occur characterized by (bilateral, more rarely unilateral) convulsions and loss of consciousness, which, therefore, differ clinically either not at all or only slightly from the genuine epileptic seizures. The nature of the attacks is as obscure as their ætiology. Whether in eclampsia parturientium the diminished excretion of urea has to be held responsible for the convulsions, and they thus are to be regarded as uræmic, whether in the convulsions of children reflex action plays the chief rôle, or whether we have to deal with autointoxication in which diacetic acid occurs, in the urine, or whether in all cases the presence of a bacillus is necessary (Gerdes, cf. lit.)—all these questions have to be left to future investigations. Every one admits that, in the second form, dentition, digestive disturbances, or intestinal parasites, play a certain part, yet there are certainly other factors which deserve consideration in this connection—for instance, heredity, a general neuropathic diathesis, the health of the parents, and the possible existence of rickets. The convulsions of children (eclampsia acuta infantilis) are extremely common. Clinically, all cases of this kind are very much alike, whereas ætiologically different cases differ greatly. In a given case we should, first of all, try to determine whether we have to deal with anatomical lesions (of the cortex, etc.), or whether these can be excluded; and only by the most careful examination can we avoid errors and are we able to make a correct diagnosis. Cortical diseases (cerebral infantile paralysis), epilepsy, spinal paralysis of children, the initial stage of acute diseases, etc., must be taken into consideration.

The prognosis is always doubtful, both in adults and in children, and the danger is usually greater in pregnant and

parturient women than in children. Death not rarely occurs during the convulsions, as we have said above, and we may assume that out of a hundred cases of this kind there are thirty, forty, often fifty who die, and the danger increases with the duration of the labor and the long continuance of the pains. In children a fatal issue is often brought about by a spasm of the glottis, rarely by exhaustion. Recovery frequently is incomplete, and there may be left some psychical disturbances, amaurosis or disturbances of speech, etc.

About the treatment of eclampsia the opinions are even at the present time very much divided. In pregnant or parturient women cold affusions in a warm bath, as recommended by Scanzoni, also the application of large cantharidal plasters to the neck, ought to be resorted to as soon as possible; from the nervines we can expect nothing. Mild laxatives, cautious venesection, regulation of the functions of diuresis and diaphoresis are in most cases indicated. Often we have no time to think of such measures; in urgent cases Veit (cf. lit.) has recommended large doses of morphine, beginning with three centigrammes (circ. gr. ss.) and increasing the dose to two or three decigrammes (grs. iij-grs. ivss.) a day. The eclampsia of children is, according to some—among them Henoch—best treated by inhalations of chloroform, which will soon stop the convulsions. One ought, they think, to first cut short the convulsions, and then proceed to find out their cause. Sometimes this advice is good, viz., in cases in which there exists no cerebral lesion. If one does exist, or if there are grounds for suspecting it, the inhalation will prove to be of no use, and may rather have a bad effect. It will therefore be necessary to attempt to settle this question by as short an examination as possible. If we are unable to make up our minds, a tepid bath and careful affusions, vinegar enemata, or evaporating lotions, etc., to the skin can do no harm. For the beginning this suffices; afterward it may be advisable to prescribe ice to the head in congestive conditions, possibly even leeches to the head, and in cases where collapse seems imminent, vinegar enemata, strong wine, or injections of ether. The nervines may as well be discarded in the treatment of the convulsions, as they do no good in this stage; they may, however, be used later when the immediate danger has passed. Wrapping the children in warm moist sheets (after the method of Priessnitz), while ice is kept to the head, I have known repeatedly to be

effectual. On the whole, even these measures are not reliable, and the part which a physician plays in the presence of eclampsia of children is by no means enviable.

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