can be met by intravenous medication—a method which should be used more often in cardiac emergencies.

In mitral lesions these emergencies are usually due to acute dilatation, mainly of the right side of the heart. Such a condition demands vigorous treatment, directed along two lines—first, the reduction of the load the right side is carrying, and second, stimulation of the heart muscle. To meet the first indication, venesection is by far the most satisfactory manoeuvre at our command. The writer has used it in twenty cases, has repeated it several times in several patients, and on the basis of this experience believes that it acts more promptly, more surely and more thoroughly than any medication. The amount of blood removed can be accurately controlled, and the bleeding stopped instantly if necessary. In emergency it can be performed in less time than it takes to give a hypodermic injection.

In obstetrics the objection may be raised against it that the patient, if labor ensues promptly, will lose still more blood, and that it is therefore unwise to deprive her of any beforehand. Venesection, however, may make all the difference between life and death. The amount of blood it is necessary to withdraw materially to benefit the heart is usually not over ten or twelve ounces. And with transfusion reduced to its present simple technic an equal amount of blood may be quickly introduced into the circulation. Venesection should not be withheld in the presence of acute cardiac dilatation from the fear of subsequent loss of blood.

For the stimulation of the myocardium digipuratum intravenously, or if the patient is free from digitalis, strophanthin intravenously have given the best results in the writer's hands. The latter has caused no bad effects when given to patients not under the influence of digitalis.

In spite of the greatest care in deciding which patients can go through pregnancy handicapped by cardiac disease, and in regulating their lives with regard to that handicap, there will be unavoidable catastrophes. Pregnancy and imperfect cardiac compensation are incompatible, and their coexistence constitutes always a grave menace to the patient. One or the other must be eliminated; either good compensation must be maintainable under ambulatory conditions, or pregnancy must be terminated. And if the patient's life is to be saved, the decision must be reached before the latter method of meeting the situation becomes too hazardous.

MISSISSIPPI VALLEY MEDICAL JOURNAL.—It is announced that the name of the *Louisville Monthly Journal of Medicine and Surgery* has been changed to the *Mississippi Valley Medical Journal*, which will be published as the official organ of the Mississippi Valley Medical Association, and will contain all its proceedings.

SOME OF THE CLINICAL EVIDENCE RELATING TO THE ETIOLOGY OF EPILEPSY, INCLUDING SOME NOTES ON THE CONDITION OF THE TEETH AS A FACTOR IN ITS PRODUCTION, AND ON ITS RELATION TO ALCOHOLISM AND TO MENTAL DEFECT.

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STUDENTS of epilepsy will for some time be divided into a group who adhere to the tradition that it is primarily or entirely a disease of the brain, and a group who look upon it as an intoxication, probably of intestinal origin. The writer, although having for four years held the latter theory, has not yet been convinced that epilepsy is in every case the result of infection by a specific organism, because he has so often seen the arrest of the disease follow the correction of errors in diet and the relief of indigestion and constipation without any treatment designed to remove a supposed infection. On the other hand, he has never seen the arrest of the disease occur when these simple measures have been neglected, even after the removal of the colon, not to mention the persistent use of intestinal antiseptics.

In an article on the treatment of epilepsy by diet, published in 1914,¹ the writer said that the outcome of a case might depend upon the repairing of the teeth. This statement might well have been more elaborated at the time, and in order to show on what basis of fact it rests, I have made notes on the condition of the teeth in fifty consecutive cases. In these cases the teeth have been classified as "good," "fairly good," "bad," and "very bad." In so classifying them, certain cases have been used as standards, but it is admitted that those who know much about the teeth might draw the lines elsewhere. For example, a case in which two molars are absent and the other teeth are intact is classified as having fairly good teeth, by which is meant about the average; while one in whom one bicuspid is absent and two molars and two bicuspids are almost gone is classified as having bad teeth. One in whom four molars are absent marks the line beyond which cases are classified as having very bad teeth. Only the fitness of the teeth to perform their function of chewing has been considered, and the presence of unerupted teeth has not been sought for, because the object of the work has been merely to show that the failure of the teeth to perform their function is a factor in the production of epilepsy. In age the patients range from three and a half to sixty years. They have not been selected, and include almost all the conditions that have been supposed to produce epilepsy, with the probable exception of intracranial tu-

mor. In fully half of the cases the diagnosis of epilepsy was made before they were seen by the writer, and in none of the cases has the diagnosis been disputed by others.

Of the fifty cases, five have good teeth, five have fairly good teeth, thirteen have bad teeth, and twenty-seven have very bad teeth. Twelve of the patients when seen were subject to tooth-ache, some of them always finding it painful to chew. All of the fifty were constipated. Twenty-five readily admitted that they were bolters and eleven that they habitually ate too much. Three had severe gingivitis. At least one had chronic appendicitis, the diagnosis being confirmed by x-ray. One had syphilis. Six were feeble-minded and one insane. One of the feeble-minded has a cerebellar hypoplasia and one has spastic paralysis. The patient with spastic paralysis is the only one of the fifty in whom there is physical evidence that the brain has ever suffered trauma. This patient is an idiot, nine years of age. She is said to have been well and normal until one and a half years of age, the age when children begin to eat solid food. She then had diarrhea and a convulsion. After the first convulsion she had many others and many falls, and for a time she was in status epilepticus, during which time she is said to have been blind, and since which time there has been spastic paralysis of one arm and both legs. Briefly, when the child began to take solid food, she had diarrhea and then a series of convulsions, during which there was a cerebral hemorrhage. The digestive troubles and the convulsions have continued. She eats a great deal when permitted, and cannot chew because the upper molar teeth are carious and the upper front teeth are absent. She is very constipated. She has improved greatly since having her diet adjusted to the condition of her teeth. In this case, where there is imbecility and a cerebral palsy, digestive troubles preceded the epilepsy, and the epilepsy has become less severe under treatment of the digestive troubles. This has been true of all cases seen by the writer. This case is not an exception, but is typical of at least the majority of cases in which the diagnosis of "organic" as distinguished from "idiopathic" epilepsy has been made. The diagnosis of "organic" epilepsy is too often made merely because there is a history of a fall or an injury to the head. Overfeeding, in a mistaken effort to restore the patient's strength, is often the actual cause of an epilepsy following an injury or an illness. The following are three of a number of cases that I have seen which demonstrate this. A little girl, six and a half years of age, was struck by an automobile. She was unconscious about half an hour and vomited three times. Five teeth were knocked out and there was much swelling about the face and head. About two years afterwards she had a grand mal attack, and at months later another. Now, at the age of nine, she

is having one every two or three months. Neurological examination is entirely negative. The following facts, obtained on further questioning the mother, show how grave an error would have been made in calling this a case of "organic" epilepsy, even granting that there may have been a slight concussion of the brain. The child had to be fed through a tube for a time after the accident. She lost weight and the mother had tried to build her up. She thought home-made bread was a good thing for this purpose, and made it especially for the child, who was very fond of it, and also of beans (these being two of the articles of diet which are most certain to induce attacks in epileptics). The child is "a very hearty eater, but does not seem to gain flesh." The mother has tried to persuade the child to chew her food, but without success. The child is very restless, cannot sit still, and tosses and grinds her teeth at night. Sometimes the bowels do not move for two days.

Last winter a girl ten years of age, and otherwise well, was discovered by the school physician to have a heart murmur, and was advised to rest and have "plenty of nourishing food." Forced feeding was begun, and she ate four eggs daily for about six months. She became fat and constipated and then began to have petit mal attacks.

Three years ago a boy of seventeen had pneumonia. He had always been a bolter and a gourmand, and during his convalescence he was encouraged to eat still more, especially of milk and eggs. For three years he had several eggs and a quart of milk daily. Grand mal attacks began soon after the illness and have continued. Neurological examination is negative.

Not to study these cases from the broad, although commonplace, standpoint of the general practitioner is to be guilty of negligence. It is this failure to descend to the plane of common-sense that has made the treatment of epilepsy so unsuccessful. The statement so often made, that constipation and indigestion are the results of epilepsy, is not true. In more than three hundred consecutive cases the writer has invariably obtained a history of digestive troubles preceding the epilepsy.

Of the ten cases classified as having good or fairly good teeth, all are constipated. All have gross errors of diet. Seven admit that they are bolters and three that they are gourmands. Two have very bad home conditions and four are feeble-minded. The two with bad home conditions are a boy of fifteen who, because his father is a drunkard, is always compelled to go out and earn money to buy food before he can eat, and another boy of five who is neglected for the same reason. Epilepsy in the children of alcoholics is more rationally and more scientifically accounted for in this way than by heredity. It is desirable to emphasize this point because a great deal of labor has been expended in compiling statistics to show that epilepsy in the children is the direct result of alcoholism in the parents. It is not. It is the direct result of neglect and not of heredity. There is experimental proof of this in the fact that epilepsy in

the children of alcoholic parents is just as amenable to treatment as epilepsy in other children, provided that they can receive proper food and care.

The relation of epilepsy to mental defect is another subject in regard to which the writer believes the authorities to be in error. Its frequency in the feeble-minded has been regarded as evidence that it is a disease of the brain, but, as the writer has shown in a previous article on Diet in Epilepsy, the theory that it is an intoxication of intestinal origin is in absolute harmony with observations on the feeble-minded, and in fact it is here that some of the most convincing evidence may be found. All of the imbecile epileptics seen by the writer have swallowed their food without chewing, and have eaten more than they could digest, and some of them have had the habit of swallowing paper, wood, stones, buttons and other objects. This is the reason why the prognosis is bad in such cases. Mental defect developing after the beginning of epilepsy is another thing, and it may be accounted for in one or in all of three ways: by vascular lesions in the brain occurring during the attacks; by the destructive effect of irritating toxins upon the finer tissues and structures of the central nervous system, and by the similar effect of bromides. The first thing is known to occur, while the second and third are only reasonable hypotheses. In the children of mentally defective mothers, epilepsy occurs for the same reason that it occurs in the children of alcoholics, that is, because such children are not properly fed. Since January 1, 1914, thirty-four feeble-minded epileptic children have been examined, and there was not one without severe digestive troubles and the history of bolting and gourmandizing was given by nearly all the mothers. Some of the mothers said they allowed the children to eat almost constantly because it was the only way to keep them quiet. One of the evidences of mental defect which may be seen very early in life, and which I believe to be of some diagnostic value, is the absence of the sense of having eaten enough. It is akin to the blunting of other senses, sometimes seen in imbeciles.

Errors in diet seem to have been present in all of several hundred cases studied by the writer. By an improper diet I mean one containing an excess of fried food, fried meat, fresh white bread, and other indigestible things. Epileptic children are frequently made worse by drinking large quantities of milk. Any solid food that the patient will not or cannot chew should be forbidden. Notwithstanding statements in the text books, meat is not harmful to these patients if they will chew it. I have seen many a patient who has steadily grown worse on a vegetarian diet, improve on being allowed to eat meat, on condition that he chew it. The condition of the teeth is an important guide to be followed in prescribing the diet in epilepsy, which must be mechanically as well as chemi-

cally suitable for the patient. The theory that there is a deficiency of calcium in the tissues of epileptics seems to me to be inconsistent with the fact that my own cases have always done as well, if not better, with sodium bicarbonate treatment as with calcium lactate. The temporary relief that sometimes follows the exclusion of salt from the diet may be explained by the fact that the patient has eaten less because his food has been rendered unpalatable.² Recent investigators of heredity as a factor have found that it is of less importance than it was formerly considered to be, but whatever the frequency of heredity, it must not be forgotten that wrong habits of eating are handed down from one generation to another.³

As has been stated, twenty-seven of the fifty cases have very bad teeth. Of these cases fifteen have lost four, five, or six molar teeth; five have lost all molars; in five all upper or all lower teeth are absent or carious; in two all teeth are absent or carious; in one patient all teeth are artificial; and in one, half of the teeth are artificial. It is true that neglected teeth are seen more often in hospital than in private practice, and time has not permitted me to make notes on the condition of the teeth in fifty non-epileptic hospital patients for comparison with the fifty epileptics, but I have for comparison some data from my own records of the medical inspection of school children. In one of the Brookline schools I found, among two hundred and forty-eight children, only sixteen, or 6%, with bad teeth, according to the classification used in this work, while in this group of epileptics, 80% have bad teeth. We may conclude that epilepsy is not common in those who have good teeth.

Among my cases there are some in whom epilepsy began very soon after the loss of a number of teeth. Here are two such cases:

P. M., male, age 9.

Family History. Mother has had five pregnancies and has miscarried twice.

Past History. Birth difficult. Mother in labor three days. Instrumental delivery. Asphyxia. Weighed nine pounds. Breast fed. Did not hold head up for one year. Crept at two years. Walked with support at three years. Spoke at four years. Entered school at seven and is in Grade 3. Always promoted. Lost lower molar teeth between age of four and five. When permanent teeth appeared they soon decayed. Used to drool.

Present Illness. At the age of five he began to have attacks in which he was unconscious for a few minutes, and would clench his fists and set his jaws. Knows when attacks are coming, and calls for mother to bring water. No other outcry. Does not bite tongue, froth at mouth, or pass urine or feces. Frequency, about once a month, sometimes with an interval of several months. Has a good appetite. Eats more rapidly than other children. His mother says, "He wants to put in a great big bite and swallow it down."

Physical Examination. Heart negative. Some tenderness over cecum. All lower molar teeth ab-

sent. Eyes negative. All cranial nerves normal. No tremor. All tendon reflexes lively and equal. Cutaneous reflexes normal. No ataxia. Gait awkward with feet apart. Movements of hands awkward. Lower lip hangs down and mouth is open, while nares are not obstructed. Expression not alert. Eyes vacant. Does not pass mental tests suitable to age and environment.

In this case there was probably trauma at birth, causing mental defect, but the epilepsy did not begin until the age of five, and it followed the loss of the molar teeth.

A young woman of twenty was operated on for appendicitis three years ago, and after the operation she suffered from constipation. All her upper molar teeth and upper incisors were artificial and supported by bridge work. A year ago, because of severe trifacial neuralgia the artificial teeth were removed, so that she could no longer chew her food. The neuralgia was not relieved, and soon after losing the teeth she had an epileptic attack, and she has had three other attacks since then.

The work of having the teeth of these patients repaired proceeds very slowly, but at some future time I hope to report the results, if any, thus obtained. At this time it can only be said that those patients who have had the work done are doing well.

When there is difficulty in making a diagnosis between epilepsy and hysteria, or between epilepsy and intracranial tumor, a bad condition of the teeth, in which the chewing surface is inadequate, is evidence in favor of epilepsy.

Epilepsy is rare in breast-fed infants, and it does not often occur before the age of eighteen months. In another series of fifty epileptic children under twelve years of age, the writer found that in only seven it began before the age of one year, while in twenty it began between the ages of one and two, and in only twenty-three did it begin during the long period from two until twelve. Therefore, epilepsy in childhood usually begins at the time when the child is beginning to eat solid food that requires chewing, and when the teeth are often not sufficiently developed to do the work. In four of this series of epileptic children there was spastic paralysis, demonstrating injury to the brain, but the four were all feeble-minded, and gave the usual history of gourmandizing and bolting of food, which the writer believes accounts for epilepsy in the feeble-minded.

Epilepsy resembles tuberculosis in having no specific cure, and it should be treated, like tuberculosis, by common-sense methods, with close attention to detail. It has to be regarded at once from the viewpoint of the neurologist and from that of the general practitioner. Three years ago the writer suggested intestinal surgery in some cases of epilepsy, but he has seldom been compelled to advise surgery, because good results can be obtained without it, and in the majority of cases the dentist, rather than the surgeon, should be consulted.⁴ The prognosis in

many cases of epilepsy depends largely upon the possibility of repairing the teeth.

The series of fifty cases is, of course, too small to prove that eighty per cent. of all epileptics have bad teeth, but if in a larger series the percentage were to differ by twenty-five with the percentage in my series, it would still show the majority of epileptics to have bad teeth. Most of my patients have been children, and in a series of adults the percentage having bad teeth would probably be higher.

The series of over 300 cases, in every one of which digestive disturbances preceded the epilepsy is, I believe, large enough to answer conclusively the question of whether the visceral changes found in epileptics at autopsy are primary or secondary.⁵

I am indebted to Drs. J. J. Thomas and A. W. Fairbanks for the use of the material in the Children's Hospital, where about one-third of the cases were seen.

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- ⁴ Powers: "The Role of Gastric and Intestinal Stasis in Some Cases of Epilepsy," BOSTON MEDICAL AND SURGICAL JOURNAL, Aug. 7, 1913.
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Clinical Department.

A CASE OF EPIDURAL INTRASPINAL ABSCESS OF PYOGENIC ORIGIN.

By W. J. MIXTER, M.D., BOSTON.

THE following case is reported in full on account of its rarity and also on account of my belief that there must be a few such cases, which, were they recognized and drained in time, would result favorably. It is a companion case to one reported herewith by Drs. Ayer and Viets.

Patient seen with Dr. J. W. Shaw of Newburyport, following a consultation with Dr. F. T. Lord of Boston, who advised exploratory laminectomy.

F. H.—Male, 17 years of age. *Family history* unimportant.

Past History negative except for furunculosis of face, which has been present to a greater or less extent since adolescence, and which has been quite severe during the past few weeks.

Present Illness. Sixteen days ago began to have pain in the left shoulder and about the left side of the chest, level of the fifth rib, increased on respiration. Also complained of sore throat. Was at home from school for a few days but did not see