

intoxication developed—sudden diarrhoea, sickness, great fatigue, and rapid feeble pulse. Then it was found that the urine was of a very low specific gravity and contained a low percentage of urea with a faint trace of albumin. The patient was put on carbohydrate and milk diet (about four pints of fluid daily), with bicarbonate of soda 1 drachm four times a day. No change took place in the urea output for 48 hours, but then the amount greatly increased (in spite of the greatly reduced intake of proteid), and this increase lasted for 14 days. After the confinement, when the patient was taking a much higher nitrogenous diet, the output of urea was much lower than normal. The total output of molecules was also decreased, as shown by the valency value of the urea, determined from the specific gravity of the urine. These data point, on the one hand, to the storing up of urea or its precursors, and its subsequent liberation when the patient improved on the carbohydrate milk diet, and subsequently to some definite, though not extensive, damage to the renal function as the result of the toxæmia. The condition of the mother, therefore, improved under the treatment, but measures were not taken in time to save the child, which died within three to five days after the first onset of the toxæmic symptoms. It is quite possible that some part of the mother's improvement was due to the death of the foetus.

One of the most marked features in this and the succeeding pregnancy was the alteration in the movements of the foetus in the uterus. Nothing was more definite to the mother than the gradual onset of the mark-time rhythm which appeared at varying intervals at first instead of the normal foetal movements, then entirely replacing them, and finally ending in the complete cessation of all foetal movements. This case subsequently became pregnant again (Case 5), and a successful conclusion was brought about. But much the same symptoms were manifested—general debility, large output of urine, very low specific gravity, very low total output of urea, ending in a serious condition with exaggeration of these symptoms, suggestive of profound toxæmia, and with such an effect on the foetus as to leave no doubt of its death had pregnancy been allowed to continue another 24 hours. During this patient's second pregnancy complete rest was ordered during the seventh and eighth months, and the diet was nearly entirely a carbohydrate diet except for two to three pints of milk daily. Bicarbonate of soda was given in large doses from time to time until the urine became alkaline, when it was discontinued for a time, and to these measures I ascribe the successful conclusion of the case. The chart of this case is very interesting, showing, as in Case 4, the apparent retention of urea or its precursors during the period of toxæmia with the enormous output immediately after delivery. Coincidentally the specific gravity of the urine rose from about 1004 to 1030.

These two groups of cases present features of such great difference that one is tempted to suspect whether they can be classed at all in the same category. There may be one explanation of this question. In the first group the response of the circulatory system to the circulating toxins is magnificent but expensive. It is possible that the second group of cases with the great difference in symptoms can be explained by the hypothesis that these symptoms are the result of the failure of the heart and circulation to respond to the demands made upon them. Whereas in the first group excretion of the toxins is forced upon the renal structures until they are so damaged that further function is completely inhibited, in the second group the breakdown occurs in the heart and circulation which do not respond, and the renal structures are permitted to have their own way and the toxins are not excreted to any extent. This hypothesis would account for the speedy recovery of the renal function in the second group of cases and the enormous output of urea immediately the condition (i.e., the pregnancy) was terminated.

That this is not the only explanation of the difference between these two classes of toxæmia is shown by the effect of thyroid extract on the sthenic type of case. Dr. Nicholson suggests that the condition is one of temporary athyroidism, and certainly the beneficial effects he has recorded as the result of thyroid administration prove that his suggestion is well founded. In Cases 4 and 5, the asthenic type, I administered small doses of thyroid (half a grain), but found that the symptoms were aggravated rather than improved. It is of interest to note that this patient has a slight simple enlargement of her thyroid gland. The blood

pressure has been estimated throughout by means of Dr. C. J. Martin's modification of the Riva Rocci manometer. Except that I do not consider it necessary to divest the patient's arm of the clothing (except in very fat or muscular subjects) I have followed the same routine methods as set forth in my paper on arterial blood pressure in heart disease.<sup>7</sup> In one case I estimated the total ammonia in the urine by Sørensen's formaldehyde method, but the results are not sufficiently definite to promise that any light will be thrown on the course of the disorder by this means, at any rate without further investigation.

I am fully aware of the fragmentary and incomplete nature of these notes, but such as they are I hope they may be of some use to the general practitioner and perhaps throw some light on these obscure conditions. I do not put forth my conclusions as facts, but rather as factors which have proved of considerable use to me in the management of these cases, and I have approached the subject primarily from its clinical aspect. I feel very strongly that much can be done to alleviate these conditions and that treatment should be instituted at the earliest possible opportunity with a view to arresting their further progress. Pregnant women should therefore be encouraged to consult their medical attendants on the occurrence of the least sign of any abnormal symptoms, and the blood pressure should be estimated on every convenient occasion.

Norwich.

## CÆSAREAN SECTION IN THE TREATMENT OF ECLAMPSIA GRAVIDARUM,

WITH NOTES OF A SUCCESSFUL CASE.<sup>1</sup>

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THE treatment of puerperal eclampsia is a subject of the highest importance to all those engaged in the practice of obstetrics, and is one where there is opportunity for considerable difference of opinion. This diversity of opinion, which has existed for many years, and still exists, is due mainly to the ever-changing views regarding the pathology of the disease. At present opinions as to treatment may be divided into two groups—(1) those favouring expectant treatment by drugs and other means; and (2) those favouring immediate and rapid delivery.

In the *Journal of Obstetrics and Gynaecology of the British Empire* for 1904, vol. v., p. 263, Comyns Berkeley has collected the opinions of a number of obstetricians as to how they would treat puerperal eclampsia. The extraordinary divergence in the methods recommended is the most striking feature in this essay. Certain of those who have replied to the questions asked recommend morphia, because it hinders metabolism, whilst others recommend thyroid extract, because it aids the metabolism of nitrogenous substances. Even in the use of purgatives there is absence of unanimity; some strongly advocate their use, others think they are harmful. There seems to be more agreement concerning abdominal and vaginal Cæsarean section, for both operations are regarded by the majority as being unjustifiable.

There are few who have had a sufficiently large experience of this disease to enable them to dogmatise over the methods of treatment. Indeed, the more cases of eclampsia one sees the more is one impressed with the great variability in the symptoms, course, and sequel of the disease. There is further considerable difficulty in appraising the true value of many of the methods of treatment, for from 75 to 80 per cent. of the patients recover, and our methods are as yet purely empirical, for we do not know the cause or causes of the disease. The toxic theory which now finds favour is nothing more than a return to the humoral pathology of our forefathers, and the treatment advocated in bygone days founded on that pathology compares favourably with the so-called modern methods. Unfortunately, under the term "puerperal eclampsia" more than one disease is included, for some writers seem to have grouped under this designation all those conditions in which fits occurred, and for this reason many statistical tables have to be disregarded.

<sup>7</sup> THE LANCET, Sept. 29th, 1906, p. 846.

<sup>1</sup> Delivered before the Section of Obstetrics and Gynaecology, Royal Society of Medicine.

I was led to consider anew the question of rapid delivery in this disease through having encountered in my private work a severe example of eclampsia gravidarum.

*Notes of a successful case.*—A lady, aged 26 years, a primipara, had been married for a year and had always enjoyed good health. She missed her first period in September, 1907, and was examined by her medical attendant when about six or eight weeks pregnant, and everything was reported to be normal. She went to the South of France and remained until February, 1908. On her return she was again seen by her doctor, when she expressed herself as feeling very well indeed, but unable to walk as far as she had been in the habit of walking. Early in April her father became seriously ill and ultimately died on April 30th. She was very much attached to her father and his illness came as a great shock to her and completely upset her nervous system. On April 19th her own doctor was sent for, and he found her complaining of indigestion, flatulence, and other signs of gastric disturbance. On April 20th she was not feeling very well all day, but was able to be up and about the house, although complaining of headache. Suddenly at about 8 P.M. without any warning she had two or three very bad fits. I was telephoned for and was told that in the last fit she had nearly died, and her condition was so bad that the case was hopeless. An injection of morphia was given. I reached the house about 10 P.M. and found the patient in a semi-comatose condition. Her face was livid and her eyelids swollen. A small quantity of urine was withdrawn by catheter and found to be solid with albumin. She had another fit in my presence. Her pulse was very rapid and her tongue had been badly bitten. I at once decided to empty the uterus and for this purpose she was put deeply under chloroform and an attempt made to dilate the cervix, first with metal dilators and subsequently with the gloved fingers. The cervix was elongated and extremely rigid; indeed, I had never encountered such a degree of rigidity. As little or no progress was being made with the dilatation, and as the fits were constantly recurring and of such severity that on more than one occasion she appeared to be dying, I decided that the best course to pursue was to empty the uterus by the Cæsarean operation. After having explained the situation to her husband and obtained his consent, a rapid Cæsarean section was done at 2.30 A.M. Whilst undergoing the operation the patient had one specially severe fit, and her own doctor, who administered chloroform, probably never had a more trying experience.

The operation presented no difficulty, but what was specially noticeable was the marked contraction and retraction of the uterus following on the removal of the foetus and placenta. This not only facilitated the introduction of the sutures, but markedly diminished the amount of blood loss. The child, when extracted, was dead. The uterine wall was sutured with deep and superficial silkworm-gut sutures, and the abdominal wall closed by a continuous peritoneal suture of catgut, through-and-through silkworm-gut sutures not including the peritoneum, and a continuous catgut suture for the fascia. The through-and-through sutures were employed because the abdominal walls contained a considerable amount of fat. The instruments used were a scalpel, a pair of scissors, two pairs of artery forceps, a straight needle, and a curved needle. A smooth bedroom towel was cut into four pieces, which were then boiled and used as abdominal sponges. I wore rubber gloves.

After the operation the fits ceased, but the patient remained in a semi-comatose condition, the pulse being very rapid and feeble. At 8 A.M. she had a fit, for which a hypodermic injection of morphia was given. This was the only fit subsequent to the operation. The chloroform did not prevent the fits during its administration. She was inclined to be restless during the remainder of the day, but passed a "fair" quantity of urine. The pulse continued rapid and she had occasional vomiting. On April 22nd she passed a good quantity of urine; pulse rapid; was very restless, but did not complain of pain. On the 23rd she took some milk and water. Very restless. Urine 48 ounces; pulse very rapid. Complained of indigestion. Sleeping at intervals; perspired. On the 24th a good quantity of urine was passed; she was not so restless; pulse not so rapid. Complained of great pain in the chest. She took Bengel's food well. On the 25th she was improving. The bowels acted well; good quantities of urine containing less albumin; pulse much slower and better. Slept fairly well.

The patient continued to make rapid progress. A few of the stitches in the abdominal wall were removed on April 30th and the remainder on May 2nd. The wound healed well. The tongue was badly bitten during the fits, producing two very deep lacerated wounds; these eventually healed under antiseptic mouth-washes, but were a cause of much pain and discomfort. The temperature on one or two occasions reached 100° F., but remained at the normal level at other times. During the convalescence she complained of indigestion and flatulence. A fish diet was given on April 30th. Her nurses left on May 26th. She sailed for Canada early in June and was reported to be quite well. The urine had been normal and free from albumin since April 30th.

I regret that it was not possible to record the case with greater detail, more especially the condition of the urine. Professor Osler kindly saw the patient on the second day after the operation. She has continued to enjoy good health, but has not again become pregnant.

*Results of study of the literature.*—I find that Van den Akker in 1875 is credited with being the first to perform with good result Cæsarean section in eclampsia, combined with contraction of the pelvis, although 100 years previously Lauverjat is alleged to have recommended the operation.

In 1889 Halbertsma advocated the adoption of the Cæsarean operation on the ground that it offered a good result to the mother and child and that it influenced so much the course of the disease. He recorded three cases, all primiparæ, aged respectively 26, 27, and 23 years. The first operation was fatal, the other two were successful. He concluded that if a woman in the last three months of pregnancy has eclampsia, medical treatment which endangers mother and child should not be prescribed, but operation should be done at once.

Kettlitz in 1897 gave a survey of the history of Cæsarean section for eclampsia up to and including the year 1896, and found in all 28 cases, giving a maternal mortality of 50 per cent.

Hillmann in 1899 described a case and gives the mortality in 40 cases as 52.5 per cent.

Streickeisen in 1903 made a further collection of cases and added 26 more, giving a maternal mortality in the 26 cases of 32 per cent.

Olshausen reported in 1900 that out of his last 250 cases of eclampsia he had performed Cæsarean section three times, two of the mothers surviving and all the children. In all three the fits ceased after the operation; the first, however, died six hours later from eclamptic coma. He advises the operation where the case is severe with a rapid succession of fits and where labour has not commenced. When the cervix is rigid and the os closed he prefers vaginal Cæsarean section.

The Transactions of the Edinburgh Obstetrical Society for 1903-1904, Vol. XXXIX., p. 194, contain records of two cases of eclampsia for which Cæsarean section was performed by Sir J. Halliday Croom. These cases appear to be the first and only examples recorded in this country.

The first case was a primipara, aged 20 years, who was between 8½ and 9 months pregnant. The operation, a Porro-Cæsarean section, was performed for the following reasons. 1. Her comatose condition and the rapid succession of convulsions. They continued to recur at intervals of less than five minutes. 2. The hypertrophy of the cervix. 3. The impossibility of dilating the cervix. 4. The contracted condition of the vagina as well as the pelvis generally. During the course of the operation there was no recurrence of the convulsions, the cyanosis was less marked, and the patient's condition generally improved. The patient died six hours later following a severe eclamptic seizure. The cervix is stated to have been absolutely undilatable either by fingers or instruments. Barnes's bags were quite useless, Hegar's dilators had no effect, and Bossi's instrument was not at the time known in this country.

The second case was a primipara, aged 46 years. Shortly before labour began she had an eclamptic seizure. The fits became worse with the onset of labour, the intervals shorter, and the coma profound. When seen by Sir Halliday Croom she had been unconscious for ten hours. The cervix was thickened and hypertrophied, projecting but slightly into the vagina, the foetus was far above the brim, and the pelvis generally and uniformly contracted in the first degree. Dilatation was discussed and abandoned because there was no hope of dilating the cervix within reasonable time. It

was important to save the child for succession reasons. Cæsarean section was performed and a living child extracted. The mother soon regained consciousness, and remained conscious for two days, but on the third day she died from a low form of pneumonia, whether septic in origin or not remained doubtful.

These two cases with a fatal termination are the only instances recorded in this country where Cæsarean section has been tried in the treatment of puerperal eclampsia.

At the International Congress in Geneva in 1896 the opinion was expressed that "Cæsarean section as well as forceps delivery should not be regarded as ordinary operations, and are only justified when every kind of treatment has entirely failed." If this opinion is acted upon, then Cæsarean section would always have a high mortality, for the severe cases would alone be operated on, and then only after other methods of treatment had been tried and had failed.

Let us look, however, for a moment into the question of the maternal and foetal mortality following this operation as compared with what happens after other methods of treatment. Streickeisen found in the 26 cases already referred to a maternal mortality of 32 per cent. Kettlitz calculated from his cases a mortality of 50 per cent. The mortality in eclampsia treated by other methods is given as about 20-25 per cent. The foetal mortality in eclampsia generally is between 44 and 54 per cent. Streickeisen gives in his 28 cases of Cæsarean section a foetal mortality of 30 per cent., and Kettlitz a foetal mortality of 62 per cent. At present, therefore, Cæsarean section shows a high maternal mortality and a high foetal mortality, and for this reason might be condemned. But was it not the same when this operation was first considered as an alternative to embryulcia in pelvic contraction, and when it was only adopted as a last resort when other methods of delivery had failed? The modern Cæsarean operation has been successful, not only from improvements in operative technique, but because the indications for the operation have been more clearly defined and acted upon without delay and before the patient has become infected through futile attempts to deliver. If this operation is to have a place in the treatment of eclampsia, we must be able to say, "This is a case for Cæsarean section," and have the courage to act promptly, for to delay until the patient is moribund and all treatment has been a failure is to court disaster.

*Indications for operation.*—What, then, are these? I would suggest the following: 1. When the fits are severe and recur in rapid succession. 2. When labour has not commenced. 3. When the cervix is difficult to dilate from elongation, hypertrophy, or excessive rigidity. 4. When the mother is moribund and the foetus living and viable. 5. When labour has commenced and there is found considerable disproportion between the size of the child and that of the pelvis. 6. When the surroundings of the patient are suitable for a major surgical operation and when the services of an operator skilled in pelvic surgery can be obtained.

Eclampsia, as a rule, is not encountered before the second half of pregnancy, and becomes more frequent the nearer term is approached. Zweifel has, however, reported a case occurring in the third month. When it does occur in the latter half of pregnancy the disease is usually severe, a favourable termination occurring generally in the cases in which premature labour has rapidly supervened. In such cases, when the fits are severe and rapidly succeed one another, the indication is to empty the uterus at once, and this is best accomplished by the Cæsarean operation, in which the bleeding resulting therefrom is also beneficial.

Too much time should not be spent in such cases in attempting to dilate the cervix. Unless the cervical tissues rapidly yield to the methods of dilatation adopted, it is a matter of common experience that such manipulations tend to increase the fits, and unless the manipulations are carefully carried out there is the further risk of septic infection. The disease being so sudden in onset, often so severe in character and distressing to behold, it may even be the means of causing the medical attendant to be less careful in his aseptic technique, as preparations may have to be made in a hurry. Septic infection is a danger which must always be prominently borne in mind, for it would appear that eclamptic patients are even more susceptible, and septic infection has already claimed many victims in this disease. The wearing of sterile indiarubber gloves should be made

compulsory for all those who engage in the practice of obstetrics, and special precautions should be taken in eclamptic cases to disinfect all instruments used.

Whatever views may be held with regard to the first three indications for this operation, I think all will agree that when the mother is moribund and the child alive an attempt should be made to save the child's life, and that this is best done by a rapid Cæsarean section.

Eclampsia which is associated with disproportion between the size of the child and that of the pelvis is a further indication for this operation, as in such cases it is undoubtedly the most rapid method of effecting delivery.

The surroundings of the patient and the surgical ability of those in attendance are important factors in deciding what course is best to pursue in the interests of the patient. If a patient can be removed to a well-ordered hospital or nursing home and can command the services of a competent operator, the chances of her recovery will be increased; or if her apartment is clean and skilled assistance at hand, the simple technique of the operation may be carried out in her own home. Should, however, the patient be in an insanitary dwelling, and no skilled surgical assistance available, her interests are best served by the adoption of expectant methods of treatment. The Cæsarean operation under modern conditions is practically free from risk and is in my opinion much to be preferred to the other methods of rapid delivery, including vaginal Cæsarean section. It offers in properly selected cases the best chance of saving the life of both mother and child, although it must be remembered that death of the foetus in utero is not infrequent on account of severe convulsions.

*The effect of the operation on the eclamptic fits* remains for consideration. The figures collected by Streickeisen show that out of 28 cases in 14 the eclamptic fits absolutely stopped; in 3 they were diminished; in 2 they remained unchanged; in 6 no particulars were given; in 2 Cæsarean section was made post mortem. Absolute cessation of the fits was observed in half the cases. It has further been observed by Dührssen and others that eclampsia ceases more frequently after artificial than after spontaneous evacuation of the uterus. Now from what we know of the effect of labour and attempts at delivery on the frequency and intensity of the fits we would expect that that method of rapid delivery which involves the least amount of disturbance to the uterus would be the most beneficial. Cæsarean section is undoubtedly the one which causes least disturbance, and its effect is borne out by the figures already given. But if it is only tried after other methods have failed much of its value is lost, for prolonged attempts at delivery aggravate the disease, make the patient's general condition worse, and diminish her chances of recovery.

*Results of treatment.*—With our present expectant methods of treatment the mortality stands at 20 to 25 per cent. Let us see what is being done to reduce it. In Germany, Dührssen, Bumm, and others strongly favour rapid delivery, but the great difficulty in arriving at a decision as to whether active treatment should be adopted is one of prognosis. It is a difficulty which arises in the whole group of diseases associated with convulsive seizures. You cannot say for certain whether a slight fit will be succeeded by one of like severity or whether a severe fit with fatal termination may not be the sequel. If it were possible to foretell with greater accuracy the course of the disease, it would be easier to indicate what treatment should be adopted.

Dührssen evidently adopts the rule, "After the first fit empty the uterus," and this I submit is a perfectly logical position to assume, but we know there are slight cases which get well quickly, or, if you will, readily yield to treatment, and that 75 to 80 per cent. of all cases recover. But we cannot foretell; we are prepared to take the risk, and this I think fairly represents our position at the present time.

Bumm, in a paper entitled "Die Behandlung der Eklampsie," gives the result of his experience of the treatment of eclampsia in Halle and Berlin. He states that he has been enabled to reduce the mortality from 25 to 30 per cent. to from 2 to 3 per cent., the former high mortality existing when expectant treatment was adopted. He believes that the quicker the uterus is emptied after the onset of the fits the better the prognosis. An achievement such as this vouchsafed by so high an authority is important evidence in favour of rapid delivery. As it is possible to collect statistics to prove either the advantages or the disadvantages of rapid delivery, it is, I think, more reliable if we can obtain

recent evidence from a competent observer who has had a considerable experience of the disease.

Herman, who has published so many valuable papers on the subject of puerperal eclampsia, is strongly opposed to rapid delivery, and in a paper published in the Transactions of the Medical Society of London, 1902, vol. xxv., p. 224, has collected a large series of statistics, showing the effect of delivery on the fits. I shall, however, only refer to his own cases. During the years 1891-1901, 38 pregnant women suffering from epileptiform convulsions were admitted into the London Hospital. Of the 38, 20 recovered and 18 died. He says: "This is a very large mortality, but it is partly due to the tendency of general practitioners to send to the hospital those cases that seem likely to end unfavourably. Thus two of the patients were admitted in deep coma and died a few hours after admission. In two others there was reason to believe that the fits were due to cerebral tumours, and the cases were therefore not puerperal eclampsia in the proper sense." A post-mortem examination was, unfortunately, not obtained in either case.

The statistics of the Glasgow Maternity Hospital collected by Munro Kerr for a period of 15 years show a mortality of 47 per cent. Jardine says: "The majority of the patients are sent in after they have been having convulsions for many hours. It is rare for us to get them within 12 hours of the first fit." If this is so, is it not due to the current teaching in this country that expectant methods of treatment should be adopted, and that when the case is beyond hope further advice is sought, and even then a continuance of this treatment is advised. The general practitioner looks for guidance to those who make a special study of obstetrics, and amongst the latter there is still considerable disagreement over the various methods of treatment.

After delivery the fits do not always cease; indeed, they may even occur for the first time during the puerperium, but they do cease in a considerable percentage of cases. It may, however, be fairly stated that the *termination of pregnancy exerts a more powerful and constant influence on the course of the disease than any method of treatment yet employed.*

Are we then to continue poisoning our patients with chloroform and morphia, or are we to hasten delivery? Of all forms of rapid delivery Cæsarean section would appear to be the best in this disease for the reasons already stated, and I would invite an expression of opinion on two important questions: 1. Is Cæsarean section justifiable in the treatment of puerperal eclampsia? 2. What are the special indications for this operation?

I think that in this country the time has arrived when a reconsideration of the propriety of rapid delivery in this disease should take place, and that definite indications should be laid down for the guidance of those who may be unfortunate enough to encounter in their practice severe cases of puerperal eclampsia.

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**LITERARY INTELLIGENCE.**—Messrs. Baillière, Tindall, and Cox will publish the following books during September:—"Manual of Physiology," by Dr. G. N. Stewart, sixth edition; "Military Hygiene," by Lieutenant-Colonel R. Caldwell, R.A.M.C., second edition; "After-results of Abdominal Operations," by Mr. A. E. Giles; "Intestinal Surgery," by Mr. L. A. Bidwell, second edition; "Gynæcological Therapeutics," by Dr. S. J. Aarons; "Veterinary Parasitology," by Mr. R. H. Smythe; "Physiological Principles in Treatment," by Dr. W. L. Brown, second edition; "Syphilis: its Diagnosis and Treatment," by Colonel F. J. Lambkin, P.A.M.C.; "Pigs, Pigsties, and Pork," by Mr. G. Mayall; "Hæmoglobinuria," by Dr. A. Charpentier; "Some Considerations of Medical Education," by Dr. S. Squire Sprigge; "Accidents in their Medico-legal Aspect," by Dr. W. Douglas Knocker; and "Medical Supervision in Schools," by Dr. E. M. Steven.

## NOTE ON THE CENTRAL ORIGIN OF SOME CASES OF SO-CALLED HEART-BLOCK.

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IN THE LANCET of June 18th, 1910 (p. 1706), appeared an annotation on a case of temporary recovery in Stokes-Adams disease recorded by Dr. H. C. Earnshaw in the *American Journal of Medical Sciences*. Dr. Earnshaw seems to accept the opinion, now, I believe, generally held, that this disease is due to heart-block, and that heart-block is due to actual disease of the heart muscle—gummatous, fibrotic, fatty, calcareous, as the case may be; but it is added, and this is the point I wish to speak about, that it is difficult to understand how temporary recovery can take place from lesions such as these.

It is because I have always had this difficulty in view myself that I am unable to accept the present doctrine of the cause of Stokes-Adams disease, at any rate as applicable to all cases of that disease. Typical cases of it are by no means common, but I hold that if a certain latitude be allowed for the presence and severity of its leading features the disease is by no means rare. However this may be, I happen to have had more or less under my notice for some 12 years a case of this kind, which was, I think, quite typical, and from it I long ago concluded that it was not cardiac in origin at all, but that it was epileptiform in its nature. As an epileptiform malady there is no difficulty in explaining Dr. Earnshaw's case.

I first saw my own patient in 1896. He was a man, aged 59 years, a strong, athletic, business man, who had epilepsy in his family. He had had gout twice in previous years, and for a year or so past he had had attacks of giddiness, faintness, and unconsciousness, mostly followed by vomiting as he came out of the attack. He had thus fallen and hurt himself. He had fallen off his bicycle; he had fallen faint when running after a rabbit; he had even when out shooting felt an attack coming on, had put down his gun, laid himself down, fainted off and come too again, and had been sick. He was at that time in good condition; keen for exercise; he had a steady heart; a pulse of 60; but his radial arteries were thick. From that time onwards he had many attacks, in most of which he probably was not seen by any medical man, but four or five months later in his natural health his pulse was still 60 and regular, and I have no doubt that it had remained so when out of his attacks at any rate, for the suggestion had been already made that his condition was due to muscular degeneration of the heart, and one cannot doubt that that organ had been repeatedly and carefully examined. In May, 1897, he had a bad attack which came on with giddiness, and went through the usual course. During it his pulse was timed at the wrist to be no more than 4 or 5 in the minute. He had at this time come out of the unconscious stage, and had, I gather, been sick. He was not white, nor was he in any clammy perspiration. His pulse slowly improved, and was fairly good next morning. On another occasion, coming round from an attack, he looked faint, and his pulse was almost imperceptible and very irregular. Fifteen months later I noted that he now easily tires; the pulse is rather irregular at the wrist—a few slow beats, then several quick ones—altogether 52 per minute. "It is hard," I say in my notes made at the time, "to say there is anything wrong with his heart. The systole at the base is a little rough, and the second sound possibly thick, but it has no ring; the first sound at the apex is also not quite clear, and yet there is nothing more than one often hears when listening to hearts that are presumably healthy." Up to this time the patient had been of active habit, between his attacks walking, shooting, &c. In August, 1900, he had an acute attack of gout, and about that time his pulse-rate permanently declined to from 24 to 36 per minute. His attacks now became much more frequent and passed more into a sort of *petit mal*, many occurring in the course of a day. One day he had an attack when my finger was on his pulse at the wrist. I think his pulse stopped *before* he became unconscious. It ceased for five or six seconds and then resumed a slower beat—20 in place of the 30 it had been before. At the end of the attack there came, as had so often happened before, eight or ten deep air hunger sort of pants. He then woke up, said he felt quite