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On the Treatment of Puerperal Convulsions.*

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SINCE the opening of the new Maternity in Montreal, October 1905, there have been treated 2,350 cases, and among these there have been 43 patients with convulsions. Four of these could not be classed as eclamptics; two patients were epileptics and had typical convulsions during pregnancy; another was a hysterical girl, four months pregnant, whose convulsions could be induced by suggestion; while the fourth, a patient who developed convulsions during the puerperium, showed at the autopsy neither the ordinary lesions of eclampsia in the liver, nor those of nephritis. This case has already been reported as a pathological anomaly to the Montreal Medical Society by Dr. Klotz.¹ To the remaining 39—1·66 per cent. of all admissions—I have added one further case of post partum eclampsia which I saw, within the last few weeks, outside the hospital, and have based the following review upon the series of forty cases.

Though all of the forty cases are classed as eclampsia, justifiably, since eclampsia means, clinically, convulsions, it is not to be assumed that the disease always presented similar characteristics; and had we been able to study the pathological lesions present, these would no doubt have varied greatly. Few now hold to the renal origin of true eclampsia, yet a differentiation of uræmic convulsions from convulsions due to necroses in the liver with superadded renal symptoms, is always difficult, often impossible. Convulsions may occur during pregnancy as the result of an old unsuspected nephritis, while patients with marked nephritis may go to term with excessively high arterial tension and sometimes complete suppression of urine, and yet

* Based on a series of forty cases from the Montreal Maternity by courtesy of Prof. J. C. Cameron, and read before the Ontario Medical Association at Toronto, Canada, June 1st, 1909.

have no convulsions. The differentiation of eclampsia from epilepsy, may, as Jardine² has noted, be difficult; particularly when convulsions occur during labour or the puerperium. In two instances, patients with a previous history of epilepsy, yet with high blood pressure, marked albuminuria and, in one instance, a coagulation time of 2.25 minutes, had what were undoubtedly eclamptic convulsions and were treated as eclamptics with good result.

The division of these cases into ante, intra and post partum, is difficult. Nine (22.5 per cent.) were post partum and ten of the remaining 31 were in women at term. In most instances labour was in progress when the patient was first seen, and it would seem, that, in true eclampsia labour starts with or before the onset of convulsions. This makes the division into "antepartum" and "intrapartum" difficult, and a more reasonable classification is suggested as follows:—

- (a) Eclampsia in patients before term, 21—52.5 per cent.
- (b) Eclampsia in patients at term, 10—25 per cent.
- (c) Eclampsia in patients after confinement, 9—22.5 per cent.

Subdivision of (a) and (b) could then be made according as the patient was in labour or not.

It is interesting to note that 32 of 40 cases (80 per cent.) occurred between October 1st and March 31st; and, while the incidence of the disease in Montreal is no greater than in many places with a milder climate—for example, Florence, (Cova³)—yet it would seem that the severity of the winter and the difficulty of access to out-house and lavatory, with consequent tendency to chronic constipation, may, in some measure, account for the greater frequency of the condition during this season of the year.

We have noticed no variation from the usual premonitory symptoms, and albumen was present in the urine in all the cases. Incidentally, the pelvis was normal in every instance. When a definite history could be obtained, severe epigastric pain was always noted, but in many instances a history was difficult to obtain, as the patients regained full consciousness only 48—73 hours after confinement, and then had no recollection of anything that had occurred during 24 hours or more previous to the onset of convulsions. Persistent nausea and vomiting was frequently noted; but in only one instance was there a history of disturbed vision. The blood pressure varied usually between 160—200 mm., though in three instances it was recorded as 125, 133, and 150 mm. respectively. Dr. Graham was good enough to make observations on the coagulation time of the blood in five cases, and all showed marked decrease to a time varying between $2\frac{1}{4}$ and $2\frac{1}{2}$ minutes.* This time gradually

* Measurements made with Boggs' Modification of the Brodie-Russell instrument which, according to Hinman and Sladen,²⁵ shows the normal time to be 5-8 minutes.

increased with improvement of the patient and seemed a reliable guide to her general condition.

Now while these cases have been quite unexceptional, so far as symptoms have been concerned, they have been exceptional in that but four of forty—10 per cent.—have died; a fact, which seems to justify some extensive consideration of the treatment employed.

The fatal cases were as follows—

CASE I. A. O'H., aged 26, primipara, admitted June 13, 1907, in deep coma after three convulsions; child in L.O.A., foetal heart 96 per minute. Her physician reported that there was no evidence of the onset of labour, and on this account and on account of the evidently serious condition of the child, it was felt that immediate delivery was not indicated. In spite of sweating and the removal of 1000 cc. of blood from the fore-arm, there were three further convulsions, and immediate delivery was decided upon, particularly as the urine was almost black, and contained blood, hyaline and granular casts.

The cervix, which was soft and partially thinned out, was easily dilated, and the child was turned and extracted. It was dead. A slight laceration of the cervix was repaired with catgut, after which the patient was infused and transfused and given another sweat bath. Her general condition improved slightly, but she developed marked jaundice, and there was almost complete suppression of urine. At the same time ascites developed and contra-indicated further administration of fluid. She died suddenly on the third day, having been conscious from the time of delivery. An autopsy was performed by Prof. Adami, who considered the cause of death to be acute yellow atrophy of the liver.

CASE II. B.G., aged 35, sextipara, admitted to the Hospital January 24, 1908, had five convulsions at her home, and three more after admission to the Hospital and before delivery by forceps after manual dilatation of the cervix. The operation was fairly easy and the child was born alive. The patient lost a large quantity of blood at the operation, but in spite of the delivery and this loss of blood, she had two further convulsions, and remained comatose for about 24 hours, becoming markedly jaundiced and secreting very little urine. The small quantity of urine obtained showed 17 gms. per litre of albumen, and numerous hyaline and granular casts. She showed some sign of improvement but died suddenly on the morning of the fourth day. No autopsy.

CASE III. M.S., aged 21, primipara, was admitted to the Hospital November 24, 1908. There was no evidence of the onset of labour and the child was alive, position R.O.A. The patient was treated with morphia, after the manner in vogue in the Rotunda Hospital.

but as there was no improvement in her condition she was delivered by *accouchement forcé* the following morning. The cervix was dilated bimanually and craniotomy was done on the child, which, in the meantime, had died. Morphia was repeated after delivery of the child, but the patient's condition did not improve and she died about twenty-eight hours later from œdema of the lungs. No autopsy.

About two hours prior to her death about 400 cc. of blood was obtained, with great difficulty, from the veins of the fore-arm. The blood was very black and coagulated immediately.

CASE IV. E.S., aged 18, primipara, was admitted March 10, 1909, with evidences of severe toxæmia. She was placed on fluids and given large doses of salts. In spite of this, on the following morning she was very drowsy, the œdema had increased, and the urine was decreased in quantity. A bougie was introduced through the cervix in the hope of bringing on labour, and pains started almost immediately. During the first stage of labour, the patient had a typical eclamptic attack and the labour was then terminated by manual dilatation of the cervix, version and extraction. The child was born alive. During dilatation the cervix was torn on both sides and these tears were closed with catgut.

The patient was still comatose after delivery and venesection was done. After 1000 cc. of blood had been removed, the blood pressure fell from 170 mm. to 55 mm. and her general condition was much improved. She continued to improve, although there was a slight elevation of temperature, and she was apparently progressing favourably, when on the twelfth day, after a period of drowsiness, she suddenly showed evidence of hemiplegia and lost the power of speech. Her condition went from bad to worse and she died three days later. Before death blood cultures were taken, which were negative. At the autopsy there was evidence of extensive thrombosis of the cerebral veins and in addition to this, two small foci of necrosis in the uterine wall. From these latter, bacteria were obtained in cover-slip preparation, but could not be grown in culture. It is possible that imperfect technique at the time of induction of labour, together with the extremely low pressure resulting from venesection, may have been responsible for the thrombosis.

It will be seen that two of these patients (Nos. i and iv) died from causes only indirectly connected with the eclampsia, and it is doubtful whether any treatment could have availed in the case of acute yellow atrophy. The cerebral thrombosis, on the other hand, occurred after the patient had recovered from her toxæmia, as was determined at the autopsy, where, though evidences were present both of nephritis and toxic hepatitis, the latter showed signs of healing and the former were but slight.

For the two remaining deaths there can be no explanation other than—insufficient treatment. It is worthy of note that one was treated by the morphia method, and that the other had seven convulsions prior to delivery.

It is generally conceded that delivery is followed by improvement in the general condition of the patient. After the occurrence of convulsions in thirty-one patients undelivered, fifteen were delivered immediately and sixteen underwent treatment before delivery. In 60 per cent. of the former, and 62·5 per cent. of the latter, the convulsions ceased after labour, results similar to those of Primo⁴ (60 per cent.), and Kosinsky⁵ (51 per cent.). It will be seen that the preliminary treatment had little or no effect in minimizing the possibility of convulsions post partum.

Admitting that these figures may be uninformative in their similarity so far as the mother is concerned, the same is not true regarding the children.

Of the fifteen patients immediately delivered, one child was not viable, and in a second instance the child was dead in utero when admitted; from the remaining thirteen cases twelve live babies were obtained—92 per cent. Of the remaining sixteen, not immediately delivered, two were admitted with children dead in utero, and one not viable child was still-born. From the remaining thirteen three live babies were obtained—23 per cent. This difference of 69 per cent. in favour of the child, when the patient is immediately delivered, is worthy of note. Immediate delivery, apart from benefiting the mother, offers four times as good a chance for the child.

Temporizing treatment is based on the assumption of the negligibility of the child. Mirto⁶ and Mangiagalli,⁷ in so-called “expurgated” statistics, place the maternal mortality with veratrum viride at 8·04 per cent. and 6·34 per cent. respectively, while Sturmer,⁸ of the Indian Medical Service, after twenty years experience with the drug, gives a probably truer figure—45 per cent. Mangiagalli⁷ frankly writes: “Nor need we think of the poisonous action of the veratrum on the fœtus, for, on its death, one source, and according to some the principal one, of the poisoning of the mother is eliminated.” His fetal mortality is 41·37 per cent., Mirto’s is not stated.

Hastings Tweedy,⁹ of the Rotunda Hospital in Dublin, who advises the morphia treatment, has a maternal mortality of 16·4 per cent. (16·9 per cent.), but he and De la Harpe,¹⁰ who has described the treatment in extenso, both neglect to mention the fœtal mortality.

Three of our patients had veratrum. Two, to whom the drug was administered outside the Hospital, entered with the child already dead in utero. In the third instance we ourselves tried the effect of

the drug upon a patient with a blood pressure of 210 mm. The first effect noted was a fall to 115 mm., then, in spite of continuous dosage, a rise to 150, 180, 190, and finally 225 mm., when delivery seemed the safer course.

Morphia we have used in small doses, as it, too, is dangerous for the fœtus when given frequently, and, in as much as it effectually checks all elimination, its administration seems irrational, except perhaps when the patient is conscious and very restless.

Other drugs, pilocarpin suggested by Harle¹¹ and Macnaughton Jones,¹² and nitro-glycerine suggested by McCarthy,¹³ we have not used, as the general opinion seems to be that they are not only dangerous but of doubtful utility.

Chloral we have given in a few cases but without definite satisfactory result. As an eclamptic patient is already poisoned, the use of drugs should be discouraged.

It has been seen that if we consider both fœtus and mother, immediate delivery offers the best chance for both. If the child is not viable, or has already perished from the effects of the toxæmia, it may be considered as negligible, and under these circumstances temporizing measures are permissible, perhaps desirable, as little is to be gained from delivery except in cases, fortunately comparatively rare, where convulsions continue after the death of the child. In certain cases, too, where labour has not set in and the cervix is rigid, it is doubtful whether a practitioner, in the absence of assistants, is not justified in temporizing at the expense of the child, and refusing to dilate forcibly until confident that this can be done without too great a risk for the mother. Here a simple measure is the introduction of a bougie into the uterus and packing the cervix with gauze, a procedure usually soon followed by strong pains and marked softening of the cervix.

That our own practice has been to deliver as speedily as possible may be judged from the sub-joined table.

Spontaneous delivery	4
„ „ after induction of labour ...	1
Forceps, after complete dilatation	2
Vaginal Cæsarean section	1
Pomeroy bag and forceps	2
„ „ and Braxton-Hick's version	1
Dilatation—Edgar Bonnaire—with forceps ...	4
„ „ „ „ craniotomy	1
„ —Harris—with forceps	8
„ „ „ version	6
Version and extraction	1

In addition, labour was induced in one of those cases indexed under 'Dilatation—Harris,' where the patient was profoundly toxic,

and eclampsia occurred after labour pains had set in. The Pomeroy bag was also used in six or seven cases, as a vaginal dilator preparatory to manual dilatation of the cervix.

Apart from one vaginal Cæsarean section the methods of delivery have been distinctly obstetrical as opposed to surgical; an attempt was made to treat these cases as if met with in practice. This was more justifiable in that in every instance the pelvis was normal.

Cæsarean section, the most rapid means of emptying the uterus, has not been employed, nor, and here we follow Pfannenstiel¹⁴ and Williams,¹⁵ do we believe that the operation should be seriously considered with eclampsia alone as an indication. The operation presupposes the hospital and adds to its mortality of eclampsia, and its own mortality, however small. There is no certainty that after operation convulsions will cease, and a patient with a laparotomy wound is not a desirable subject for convulsions. Moreover, in cases of extreme toxæmia, tissue repair is slow and uncertain, and the possibility of infection is here much greater than with other methods of treatment.

Vaginal section, while simple and rapid, is only necessary if the cervix is very rigid and undilatable by other means. It, too, presupposes special surroundings and a number of assistants. The one case here reported was theoretically unsuited for the operation in that the child was already dead. In spite of the death of the child the convulsions increased in number and severity, and, as labour had not set in, incision of the cervix seemed justifiable.

Apart from Cæsarean section and vaginal Cæsarean section, there remains only forcible dilatation of the cervix, either instrumentally or by the hand. With instrumental dilatation we have had no experience, and, as may be seen from reference to the table above, Harris's method of dilatation of the cervix has been the one most consistently employed. It has been objected that this method is unsurgical, that it leads to infection, and that it is liable to result in extensive laceration of the cervix. These dangers depend almost entirely upon the condition of the cervix before the commencement of the operation; as said before, most of our cases entered with labour in progress and the cervix in these cases was very easily dilated. It is true that tears of the cervix occur frequently; in fact in only three instances was there no evidence of slight damage to the cervix, and in nine instances the cervix was sutured after the completion of delivery. As a result these patients left the Hospital in quite as satisfactory a condition as if labour had been spontaneous. Immediate repair of the cervix has been objected to on many grounds, chiefly because of the danger of infection. The morbidity percentage in our cases of accouchement forcé, where Harris's method has been employed, has been no higher than the general average for all cases. In only three of the fifteen cases here reported

did the temperature rise above $100\cdot5^{\circ}$, and then only for a few hours. Harris's method has seemed better than the bimanual method, as, in our experience, the tears with the latter have been usually bilateral and have usually, particularly when not sutured, resulted in marked eversion of both lips of the cervix.

The Pomeroy bag has been of inestimable value for vaginal distension, but its bulk has rendered its introduction into the cervix difficult, and if the cervix was sufficiently dilated to allow its passage Harris's method could usually be performed. Moreover, with a Pomeroy bag, very carefully used, tears were quite as frequent as with manual dilatation, and, in our experience, these tears were unusually jagged and difficult to repair.

After the completion of dilatation of the cervix version would possibly seem the better operation, particularly if the membranes have remained unruptured. It is more rapid than forceps and so requires a lessened period of anæsthesia, and when not contra-indicated it has been invariably the operation of choice.

With reference to the anæsthetic, chloroform is undoubtedly preferable to ether, but in view of the fact that the evidences of chloroform poisoning are practically identical with the lesions of eclampsia in the liver its administration should be minimised. It is a common error, in administering chloroform for the control of convulsions, to give the chloroform not in the intervals but when the convulsions have started; at this time the patient's most urgent need is not an anæsthetic but oxygen.

When convulsions recur after delivery, or occur during the puerperium, it must be assumed that secondary influences are at work and that the toxins circulating in the blood at the time of delivery are being augmented as the result of that disordered metabolism which delivery has not immediately arrested. The indication, then, is to remove that toxin as speedily as possible, and to minimize metabolism so far as we are able. Partial or complete suppression of the urine being the rule, the skin may act in place of the kidneys, and we have had great success with the use of hot air baths. Leopold¹⁶ and Döderlein¹⁷ have recently pronounced against sweating in the treatment of eclampsia, but, if before the bath is given, the stomach or rectum be filled with fluid, it is doubtful whether the toxicity of the blood will be augmented by the procedure, as is claimed by these objectors. For the bath the patient is rolled in blankets, and an air chamber is made by means of cradles and several layers of blankets covered by a rubber sheet. Dry hot air is introduced by means of an asbestos covered pipe, placed over an ordinary Bunsen burner. The patient usually sweats profusely after some twenty-five minutes, and the bath is continued for twenty minutes, or less, if the patient's condition seems to contraindicate it. After this the blankets are gradually removed and the patient is

rubbed down. The hot air bath is much more easily given and is much more effectual than the hot pack. In addition to the removal of the toxin, the patient comes out of the bath thirsty, and will willingly drink anything, even saturated solution of magnesium sulphate.

Better, and more effectual than sweating, is bleeding. This practice, well-known to our fathers, has for some reason fallen into disuse. In Ramsbotham's "Obstetric Medicine and Surgery, published in 1841, I find (page 576) this paragraph, which is worth quoting in its entirety. "Bleeding is our great reliance—the lancet is our sheet anchor—and blood may be taken to a very large extent; it may be necessary to draw 40, 50 or 60 ounces, nay even more, in the course of a very few hours. If ten or twelve only be abstracted the patient seldom obtains much benefit; depletion will avail us little, unless a decided impression be made on the system generally. We observe that a woman will bear the loss of a larger quantity of blood under puerperal convulsions,—as in apoplexy,—without fainting, than in almost any other affection." Again (page 582): "Gooch used to say that he never had lost a patient under convulsions, when free bleeding had been practised; but that all the women who had died under his observation had been bled insufficiently." *

In puerperal eclampsia our own experience has been that of Gooch; and in eclampsia generally we are with Ramsbotham, except as regards the quantity of blood to be removed. It is doubtful whether 300 to 500 cc., as suggested by Whitridge Williams,¹⁸ is ever a sufficient quantity to withdraw, and in our own experience a second venesection was necessary in two instances where 350 to 400 cc. had been withdrawn the first time. It would seem proper to bleed the patient until pallor or weakness of the pulse supervened, usually after 700 to 900 cc. have been withdrawn.

In one of our fatal cases it is possible that bleeding contributed to death—a very mild infection was followed by cerebral thrombosis. This possibility is no contraindication to bleeding as a method of treatment.

It has been objected that venesection is difficult on account of the viscosity of the blood. This is not so; the operation is extremely simple. An anæsthetic is not always necessary. A superficial vein, usually the median basilic or median cephalic, is exposed by an incision three to four centimetres long, and a cut is made in its wall with a scalpel or scissors. Light pressure on the veins of the upper arm will usually cause the blood to flow freely and an Esmarch is

* Gooch, born 1774, died 1830; was born in Edinburgh and later moved to London where he was Obstetrician to the Westminster Lying-in and Instructor in Diseases of Women at St. Bartholomew's. He enjoyed the unusual distinction of having many of his works translated into German.

unnecessary. After a sufficient quantity of blood has been withdrawn, pressure, or in some cases a lateral ligature, will stop the flow from the vein, and the skin wound can then be closed. Non-absorbable sutures are desirable as, if the patient is very toxic, it is often many days before the edges of the wound show a tendency to unite. An anterior splint is also an aid to satisfactory union.

A third accessory measure in the treatment is the administration to the patient of large quantities of fluid. This has recently become an important factor in the treatment in many clinics, but usually the administration is by infusion or transfusion. We have followed the method employed at the Lakeside Hospital, Cleveland, where this treatment was, I believe, first introduced for typhoid toxæmia. The patient is given a feeder (200 cc.) full of water, by mouth, every twenty minutes. If she is comatose the fluid may be introduced by a stomach or nasal tube, while if nauseated, which is unusual, the fluid may be administered per rectum. As noted above, patients who have been sweated are usually very thirsty and drink freely.

It is important that the amount of fluid given and the amount excreted should be carefully noted, particularly during the first twenty-four or forty-eight hours when the kidneys are inactive, so that if the excretion is insufficient it may be aided by frequent sweating. Free evacuation of the bowels may also be induced by large doses of magnesium sulphate, or in certain instances 2 to 3 mm. of croton oil in castor or olive oil. In estimating the quantity of fluid excreted, the stools are measured exactly as is the urine and the total compared with the amount of fluid administered. This is an important indication of the patient's general condition. In the majority of cases there is marked diuresis about the third day, and the quantity of urine in twenty-four hours will often be a litre or more in excess of the amount of fluid given. The amount administered in cases in which this treatment has been adopted has averaged $5\frac{1}{2}$ litres for the first five days; the average maximum was 6 to 7 litres, though in individual cases $9\frac{1}{2}$ to 10 litres have been given. No milk was given in any of the cases until the patient had been conscious for two or three days and diuresis was well established.

We have had no experience with Edebohls' operation, so strongly recommended by Krönig¹⁹ in post partum eclampsia with anuria. The operation is based on the assumption that anuria is due to increased tension of the kidney substance, but Haim,²⁰ Essen-Möller,²¹ and Kleinhertz²² have recently reported cases in which no increased tension was found, and in which the patient showed no improvement after the operation. While successful cases are still occasionally reported, it is doubtful whether these might not have improved under less radical treatment. I doubt if anyone will agree with Gauss²³ that the operation should be done in one sitting with

accouchement forcé, and difficulties will ever arise in deciding the exact indications and proper time for operating, also from the uncertainty, as noted above, of finding expected hypertension and achieving the desired end.

Nor have we tried another so-called treatment—lumbar puncture. Audebert and Fournier²⁴ have collected forty-six cases with a mortality of 35 per cent., statistics which discredit a most irrational procedure that has outlived its short and unmerited popularity.

Our own treatment has become more or less a routine, and from a study of the appended cases the following general rules are suggested:—

(1) Minimize the use of narcotics and anæsthetics. Chloroform is rarely indicated for the control of convulsions, but should be used when general anæsthesia is required for examination or delivery.

(2) Immediate delivery is advisable, particularly when the child is viable.

(3) In the majority of cases the onset of labour is more or less intimately associated with the onset of convulsions; accouchement forcé—preferably Harris's method followed by version—has given the best results.

(4) Immediately after delivery, if not before, the stomach should be washed out, and several ounces of magnesium sulphate, well diluted with warm water, should be introduced through the tube. The patient should then be sweated by means of a hot air bath or hot pack.

(5) If convulsions recur after delivery, and particularly in post partum eclampsia, the best results are obtained by withdrawing 700—900 cc. of blood from one of the veins of the forearm.

(6) A large quantity of fluid (forced fluids) should be given for several days, and the amount so given should be carefully tabulated for comparison with the amount of fluid eliminated in the urine and stools. If the excretion is inadequate, repeat the sweating and purgation. Do not allow the patient to become waterlogged.

(7) Careful records of ingestion and excretion should be kept for at least ten days, as the involution of the uterus has a marked effect on the general metabolism, particularly between the sixth and ninth days.

The following are synopses of the clinical histories, other than those included in the foregoing:—

855. A. F., aged 20, primipara, was admitted to the Hospital on December 9th, 1905. The patient had four convulsions at her home. On admission she was given morphia, hypodermically to the amount of gr $\frac{1}{2}$, and, after six further convulsions, delivery was decided upon. The cervix was soft and practically undilated. Dilatation was done (Edgar Bonnaire) and delivery effected with high forceps. The patient was given hot packs, large doses of magnesium sulphate and also chloral grs. x, hypodermically.

A large quantity of fluid was also given and the urine gradually increased in quantity. The patient developed marked jaundice but gradually improved and left the hospital on the 31st day post partum, in fair condition except that the cervix was extensively lacerated and its lips everted. The maximum temperature was 101.4° . The child was artificially fed during its stay in the hospital and was also in fair condition.

874. B.P., aged (?), primipara, was admitted on January 3, 1906. The patient had a markedly high tension pulse and moderate œdema. Two hours after admission she had a typical eclamptic attack and was immediately prepared for delivery. The cervix, which was fairly soft, was dilated by Harris's method without much damage and the child was then extracted with forceps. The child was dead. (The autopsy showed intracranial hæmorrhage,—? due to forceps). This patient had nine convulsions after delivery, within a period of about five hours, the first coming on three hours after delivery. After the 8th convulsion 750 cc. of blood were withdrawn from the forearm and though there was one convulsion after the venesection it was very slight and the patient showed marked improvement. She developed jaundice and for several days was almost maniacal but gradually recovered. The maximum temperature was 100° . The cervix, which had been torn during the operation was repaired in the third week of the puerperium and the patient left the hospital in excellent condition. In this case the result for the mother was good, the child was born dead.

912. J.D., aged 24, primipara, was admitted on January 30, 1906, after having had five convulsions at her home. She was semi-conscious on admission. As she was only 28 weeks pregnant and the child's chances were not good and there was no evidence of onset of labour she was bled 600 cc., and after washing out the stomach 3 oz. of magnesium sulphate were given by means of the stomach tube. Large quantities of fluid were also given and her condition showed marked improvement. Five days later she had a spontaneous premature labour and made an uninterrupted recovery. The maximum temperature was 99.8° . The child was still-born and not viable.

935. A.M., aged 19, primipara, admitted on February 26, 1906, at 7.30 a.m. The patient had had a number of convulsions prior to her admission, and before delivery five hours after her admission had three more,—this in spite of the withdrawal of 750 cc. of blood from the forearm, and the administration of a hot pack. The cervix was soft and was dilated bimanually (Edgar Bonnaire) and the forceps applied. The child was born dead. In spite of numerous hypodermics of chloral the patient had twelve convulsions during the twelve hours succeeding delivery, but then began to respond to treatment, which consisted of salt solution by stomach tube, submammary infusions and hot saline per rectum. The bowels moved freely, and, during the first 24 hours, she passed a moderate quantity of urine which could not be measured on account of incontinence. The maximum temperature was 105° . The patient gradually improved and left the hospital on the 18th day post partum. At this time it was found that the cervix was torn on both sides, into the fornix on the left side and high up into the lower uterine segment on the right. The uterus, however, was freely movable and in good position. The autopsy on the child showed a hæmatoma of the scalp and intracranial hæmorrhage.

995. E. F., aged 32, secundipara, was admitted on April 6, 1906. This patient had a history of convulsions after her first confinement two years ago, followed by jaundice and enlargement of the spleen. She was perfectly well up till one week prior to her admission, but for two days past had had headache. On the morning of April 6 she had a severe convulsion followed by three chills. She was then admitted to the hospital at 8.30 a.m., and in spite of hot packs and the administration of chloral hydrate, hypodermically, four further convulsions followed before her delivery at 6 p.m. The cervix was dilated bimanually and forceps applied. After delivery hot packs were continued and large quantities of fluid given. The patient regained consciousness after about 24 hours, and as the bowels moved freely and the kidneys also began to act, she made an uninterrupted recovery, and left the hospital sixteen days post partum. Maximum temperature was 100.°

When the patient left the hospital she had a deep laceration of the cervix with moderate eversion of the lips. The uterus was retroverted but could be replaced. The child was born dead.

1115. M. L., aged 16, primipara (Dr. A. E. V.), was admitted on June 23, 1906, about 26 weeks pregnant. The previous day she had complained of severe headache and pain in the interscapular region; later in the day she had severe epigastric pain, and at 11 p.m. a typical convulsion followed by five others before her admission to the hospital about midnight. When admitted she was comatose and could not be roused. The urine, obtained by catheter, was light in colour but contained 16 grms. per litre of albumin. Within three hours after admission she had four convulsions, but these were clonic in character and there was no tonic phase. A fifth convulsion, however, was more general, and was followed within half an hour by one of greater severity. At this time uterine contractions were strong, and vaginal examination showed that the cervix was soft and partially dilated. Dilatation was completed by Harris's method and the child turned and extracted, after which 2½ oz. magnesium sulphate and a large quantity of fluid were placed in the stomach by tube and a hot pack given. After delivery there were seven further convulsions but these were very mild and were not followed by deep coma. The skin responded well to the hot packs and there was incontinence of faeces and urine which continued for three days. During this time the patient developed marked jaundice and was drowsy but her condition was at no time critical. The largest quantity of urine passed in the 24 hours was 5600 cc. The maximum temperature was 100.4°. She left the hospital well on the 14th day. The child was born dead.

1309. A. S., aged 22, primipara, was admitted on November 3, 1906. This patient had two convulsions before admission to the hospital. On examination she seemed dazed but responded when asked questions; she was apparently 34-36 weeks pregnant, the child alive, position L.O.A. The blood pressure at this time registered 200 mm. The following morning she had a third convulsion, and during the coma a stomach tube was passed and four ounces of magnesium sulphate and six ounces of normal salt solution were introduced, and a hot pack given. After this the patient slept soundly. Later 2 mm. of Croton oil were administered, and on account of the high blood pressure veratrum viride was given with the result noted above (p. 150). Twenty-four hours later a bougie

was introduced into the uterus; and when the cervix was soft and partially dilated, dilatation was completed (Edgar Bonnaire), and a high forceps operation was done. The child was dead. The patient remained unconscious after the operation for about 24 hours and was given hot saline per rectum and by submammary infusion. Twenty-hours later the urine began to increase and reached a maximum of 2800 cc. on the third day; the maximum fluid given was 3200 cc. in the 24 hours. The maximum temperature in the puerperium was 102.4° , but at this time the patient had a severe tonsillitis. She left the hospital in good condition on the 24th day.

1330. K. P., aged 38, undecipara (Dr. F. W. H.), was admitted on November 21, 1906. She had eight convulsions prior to her admission, and though some years before she had had epilepsy, according to her family the convulsions at this time differed markedly in character from the epileptic attacks. The urine contained a large quantity of albumin, but the blood pressure registered only 125 mm. As the patient was in deep coma it was decided to deliver at once as the cervix readily admitted two fingers. Harris's method was employed, and after dilatation of the cervix the child was turned and extracted. A cervical tear was repaired with three catgut sutures. After delivery the patient had no further convulsions, drank freely and was given large quantities of salt solution per rectum, the maximum quantity given in 24 hours being 7230 cc., and the maximum quantity of urine 4000 cc. She was markedly delirious for the first two days post partum, but gradually improved and left the hospital in good condition fourteen days post partum. The child, which was born alive, died on the third day, and at autopsy Dr. Klotz found an unusually large foramen ovale and a marked hypertrophy of the right lobe of the thymus.

1422. E. McN., aged 26, secundipara (Dr. de J. W.), was admitted on January 27, 1907, when about 38 weeks' pregnant. She had six or eight convulsions before admission, was in deep coma, very cedematous and very restless. Accouchement forcé (Harris's method and high forceps) was done. Before delivery she had two further convulsions. The stomach was washed out after delivery and a large quantity of fluid left in and a hot air bath given. Four more hot air baths were given during the first day post partum as there was only 1410 cc. of urine in spite of the administration of 2450 cc. of fluid. On the second day the urine, which had increased in quantity, showed signs of diminishing, and the patient was bled 300 cc., after which she made an uninterrupted recovery. The maximum fluid given in the 24 hours was 10,500 cc., while the maximum of urine was 4000 cc. This patient also developed jaundice. She left the hospital with her child on the 30th day post partum in good condition.

1460. A. M., aged 41, secundipara (Dr. R. MacK.), was admitted to the hospital February 21st, 1907, when about $6\frac{1}{2}$ months' pregnant. She had had one convulsion before her admission to the hospital. On examination the patient was in fair condition, the child alive, in position L.O.A., foetal heart 144 per minute. She was evidently in labour, and interference was considered inadvisable in spite of the fact that she had a second convulsion within a couple of hours after admission. Her blood pressure at this time registered 220 mm. Later in the afternoon she was cathe-

terised and 10 cc. of urine were obtained which contained a large quantity of blood. As the pains had practically ceased the cervix was packed with gauze. In spite of the administration of salt solution per rectum the kidneys were still inactive next day and the gauze was removed and a bougie inserted. Pains came on almost at once, and after the cervix was half dilated, dilatation was completed by Harris's method and the child extracted; it was dead. Large quantities of fluid were given, the maximum in 24 hours being 4100 cc., and the maximum quantity of urine 3800 cc. The maximum temperature reached 100°. The patient developed a phlebitis but left the hospital in good condition on the 19th May.

1851. M. P., aged 22, primipara, was admitted on October 13, 1907. For some days prior to her admission she had complained of trouble with her eyes, and on the morning of admission had four convulsions before being seen by a physician, who gave her a hypodermic of morphia and advised her removal to the hospital. When admitted the urine obtained by catheter was smoky and contained 12 grms. per litre of albumin with abundant granular and hyaline casts. Her blood pressure was 155 mm. About one hour after admission she had a slight convulsion, but as labour was in progress and no foetal heart could be heard fluids and purgatives were given, and a few hours later she gave birth to a macerated child. After delivery sweat baths were continued and large quantities of fluid administered, the maximum in 24 hours reaching 10,000 cc., the diuresis 7,700 cc. The patient left the hospital in good condition on the 10th day post partum.

1878. M. L., aged 27, secundipara (Dr. W. G. S.), was admitted on October 31, 1907. For some days prior to admission she complained of headache, pain in the back and vomiting. At this time she was 35 weeks' pregnant. The urine had a specific gravity of 1032, was smoky and contained 12 grms. per litre of albumin and numerous hyaline and granular casts. The day after admission she had two convulsions, slight in character, and was given morphia $\frac{1}{4}$ gr. She was purged and given large quantities of fluid and gradually improved. Seven days later she had a spontaneous labour and left the hospital in good condition fourteen days post partum. The child, though small, was artificially fed, and left the hospital also in good condition.

1939. M. D., aged 37, undecipara, was admitted on December 15, 1907, about 34–36 weeks' pregnant. For a week she had had headache, and for some 24 hours severe epigastric pain. She was brought to the hospital after one convulsion at home, and at that time was semi-comatose and slightly cedematous. The blood pressure was 160 mm. The child was alive and in L.O.A. position. The urine had a specific gravity of 1030, was acid and contained 15 grms. per litre of albumin with numerous granular casts. She had a further convulsion after admission, and the cervix was dilated by Harris's method and forceps applied. The patient was then given a hot air bath and the usual treatment for forced fluid. About nine hours after delivery there was a further slight convulsion, but the patient gradually improved and made an uninterrupted recovery. The maximum fluid administered in 24 hours was 4800 cc., the maximum temperature 100°. Mother well, child alive.

2006. A. McL., aged 21, secundipara (Dr. A. D. S.), was admitted on February 4, 1908, with marked œdema of both lower extremities, but no other abnormality. Labour had advanced to the second stage when the patient had an eclamptic convulsion and she was immediately delivered by forceps. Following delivery there were three further convulsions, and 350 cc. of blood were withdrawn from the forearm and 600 cc. of salt solution transfused. Large quantities of water were given and 4 oz. of magnesium sulphate. The bowels moved involuntarily, and urine gradually increased in quantity and the patient made an uninterrupted recovery. The maximum fluid given in the 24 hours was 5,300 cc.; the maximum diuresis was 3,650 cc. The maximum temperature was 100.° The child was alive.

2034. M. F., aged 33, tertipara. (Dr. W. W. C.), was admitted on February 18, 1908. There had been two convulsions at home, and there was one convulsion in the hospital before delivery, which was accomplished by the dilatation of the cervix, Harris's method, and high forceps. A tear of the cervix was repaired with chromic gut, and the patient was then treated in the usual way with large quantities of fluid. About twelve hours after delivery there were two further convulsions, and as there was but a small quantity of urine, sweat baths were given frequently. The bowel too was stimulated with large doses of magnesium sulphate and there was free evacuation. The output of urine remained low for four days, during which time the sweat baths were continued; the kidneys after this acted well, though at no time was there marked diuresis. The maximum fluid given in 24 hours was 6,600 cc. The maximum temperature was 101.8,° The patient was discharged in good condition on the 17th day, though traces of albumin persisted in the urine. The child was premature but also did well.

2050. L. S., aged 18, primipara, was admitted on February 28, 1908, in labour. About two hours after admission the patient had a typical eclamptic attack. At this time the cervix was three-quarters dilated and the membranes were intact. A high enema was given and morphia grs. $\frac{1}{4}$ hypodermically. Within the next two hours the patient had six further convulsions, but by this time the cervix was fully dilated and the child was delivered with low forceps. After delivery a sweat bath was given and a quantity of magnesium sulphate administered by means of the stomach tube. There was one further convulsion after delivery but the skin responded well to the sweat baths and the kidneys began to act almost immediately, and the patient made an uninterrupted recovery. The maximum fluid given was 6,400 cc., the diuresis 3,000 cc.+, and the maximum temperature 99.1.° The result to both mother and child was good.

2069. M. P., aged 27, primipara, was admitted on March 7, 1908. While in the hospital waiting-room the patient suddenly had an eclamptic convulsion, and she was immediately brought to the case room and prepared for operation. On examination the cervical canal was found completely obliterated, and the external os partially dilated. Dilatation was completed by Harris's method and forceps applied. The child was asphyxiated but responded to artificial respiration. Immediately after the delivery the patient was given a sweat bath, and 4 oz. of magnesium

sulphate administered by means of the stomach tube. There were no further convulsions after delivery. The maximum fluid administered in the 24 hours was 6,300 cc.; the maximum temperature was 100°. Result to both mother and child good.

2167. A. G., aged 25, primipara, was admitted on May 1, 1908. During the afternoon of the day of admission the patient had complained of severe headache and had two convulsions. She was brought to the hospital at 11 p.m., and shortly after admission had a third convulsion. Labour was evidently in progress and the cervix was dilated about 5 cm. Magnesium sulphate, 4 oz., was given by means of the stomach tube, and later croton oil, mm. 2. She was perfectly rational, complained of no headache and no pain, and as there seemed no indication to deliver at once treatment was continued by means of fluids and broken doses of magnesium sulphate. Seven days later the patient delivered herself spontaneously; the child was alive. The maximum temperature was 100.4°.

2451. H. G., aged 19, primipara (Dr. A. G.), was admitted on October 8, 1908. The patient had severe epigastric pain the night before admission, and between 6 a.m. and the time of admission at 9 a.m., had six convulsions. On admission, the pulse was 90 per minute, rather full; child in L.O.A. position, foetal heart 108. The cervix was thinned out and the canal obliterated. Dilatation was performed by Harris's method and the child turned and extracted. There was a slight tear on the left side of the cervix which was immediately repaired. After delivery the patient was given magnesium sulphate and salt solution by stomach tube and sweated, but in spite of this she had three further convulsions. As the blood pressure was 180 mm. 550 cc. of blood were withdrawn by venesection and infusions given, as well as a large quantity of fluid by mouth and by rectum. The patient was quite irrational for the next 36 hours but responded well to sweating. The urine gradually increased in quantity and attained a maximum of 4,900 cc.; the maximum fluid given in the 24 hours was 5,400 cc.; the maximum temperature was 100°. The patient left the hospital on the 24th day well; the child also did well.

2466. C. G., aged 23, secundipara, entered the hospital on October 17, 1908. This patient was about 26 weeks' pregnant and showed evidence of marked toxæmia. On account of the poor outlook for the child temporizing measures were first adopted and the patient did fairly well, but four days after admission she had a severe convulsion. At this time 900 cc. of blood were withdrawn from the forearm and a sweat bath given. As labour had not set in a bougie was introduced into the cervix, and within a few hours pains set in and the patient was delivered spontaneously 12 hours after the introduction of the bougie. At this time the blood pressure was 200 mm. The same treatment as had been adopted before delivery was continued in the puerperium and the patient made an uninterrupted recovery. The maximum temperature was 99.6°. She left the hospital in good condition on the 16th day post partum; the child was stillborn and not viable.

2486. R. O., aged 22, primipara (Dr. W. M. F.), was admitted on October 28, 1908, after four convulsions at her home. On examination it

was found that the cervix was soft, and it was immediately dilated by Harris's method and the child extracted with forceps. Slight lacerations of both sides of the cervix were closed with catgut. The child was deeply asphyxiated but responded to the usual methods of resuscitation. The patient was sweated and given large quantities of fluid and she had no further convulsions after delivery. There was practically no urine for the first twelve hours but after this time the kidneys worked well, reaching 4,100 cc. on the second day. The maximum temperature was 100°. The result to the mother and child was good.

2544. M. B., aged 27, primipara (Dr. A. K.), was admitted on December 3, 1908, after three convulsions at her home. She had been given *veratrum viride* before admission. On admission it was found that the cervix was half dilated, the membranes unruptured, and the child apparently dead. Dilatation was completed by Harris's method and the Tarnier forceps applied. About four hours after delivery the patient had another convulsion and was given a second sweat bath. She was voiding freely and her condition was not considered serious, but about three hours later she had two further convulsions, at which time 850 cc. of blood were withdrawn from the forearm. After this the patient had no more convulsions. The maximum fluid administered in the 24 hours was 7,200 cc., the maximum urine voided 9,960 cc.; the maximum temperature was 100·2°. The patient left the hospital in good condition on the 16th May, post partum, though a faint trace of albumin persisted in the urine. The child was born dead (*veratrum*).

2594. M. S., aged 24, secundipara (Dr. J. M. E.), was admitted on December 30, 1908, complaining of severe headache, dimness of vision and marked œdema. The patient was about 26 weeks pregnant and on the morning of admission had had a severe convulsion. She was in a good condition, and for three days was placed upon eliminative treatment, to which she responded well. On the morning of January 2, 1909, pains came on, and with the cervix half dilated an anæsthetic was given and the child extracted. After delivery the patient had practically an uninterrupted recovery and left the hospital on the 8th day. The maximum temperature was 101°. The child was born dead.

2606. E. M., aged 24, primipara (Dr. W. M. F.), was admitted on January 9, 1909. The patient had had three convulsions at her home. On admission the cervix was found to be 4-5 cm. dilated. The Pomeroy bag was employed and the cervix and vagina easily dilated, but it was found that there was a marked contraction ring and version could not be accomplished. Tarnier forceps was applied and the child rapidly extracted. The cervix, vagina and perineum were more or less injured but were immediately repaired. After the completion of the operation a sweat bath was given at once, and the patient perspired profusely. During the 12 hours following the operation she drank about five litres of fluid and voided about 2,500 cc. of urine. In spite of this, however, there was a further convulsion eight hours after delivery, and though at this time 800 cc. of blood were withdrawn, three hours later she had another convulsion, but on the second day diuresis was well established and there was no further trouble. The maximum fluid given in the 24 hours was 8,300 cc.,

the maximum diuresis 6,800 cc. The maximum temperature was 100.4°. The patient made an uninterrupted recovery and left the hospital in good condition; the child was alive.

2609. F. K., aged 23, primipara (Dr. J. W. D.), was admitted at 10-30 p.m. on January 9, 1909, complaining of severe headache and marked œdema of hands, face and legs. Immediately after entry she voided some 250 cc. of urine which was dark in colour. She appeared to be in comparatively good condition and it was decided to temporize, but early the following morning she had a typical eclamptic convulsion. Following this 950 cc. of blood were withdrawn from the forearm and a hot air bath given. After the bath, examination showed that the cervical canal was obliterated and the external os about 3 cm. dilated. No foetal heart was heard nor had it been detected on her admission to the hospital. The vagina was dilated with the Pomeroy bag and the cervix dilated by Harris's method. As the liquor amnii was quite dark and foul the forceps was considered more conservative than version and was applied by the English method and the head drawn to the pelvic floor. The child had evidently been dead for some time. A bilateral laceration of the cervix was closed with catgut. Immediately after operation the stomach was washed out and magnesium sulphate introduced through the tube and a hot air bath started. The patient slept heavily during the greater part of the afternoon and voided 1,200 cc. of urine. About 8½ hours after operation there was a second convulsion, and two hours later a third. At this time 400 cc. of blood were withdrawn from the right arm. Four sweat baths were given on the first day and one early on the morning of the second day. The urine gradually increased in quantity and attained a maximum of 9,400 cc., the maximum fluid given in the 24 hours was 8,450 cc. The maximum temperature was 100°. The result to the mother was good; the child was born dead.

2706. I. H., aged 29, tertipara (Dr. A. A. R.), was admitted on March 6, 1909, about 8 p.m. She had had six convulsions before being seen by a physician at her home and two more before admission to the hospital. On examination the child was found to be alive in R.O.A. position and it was determined to deliver immediately, particularly as the cervix was found to admit two fingers. A Braxton-Hicks version was done and the child made to present by the breech, after which a small Pomeroy bag was introduced into the cervix and dilated. A larger one was then introduced and dilated, after which the child was extracted with very little difficulty, though the Pomeroy bag had caused an extensive tear in the posterior lip of the cervix. After the birth of the placenta the tear in the cervix was closed with catgut, the patient's stomach washed out, and a sweat bath given. After delivery there were three further convulsions and the patient was bled 600 cc., she having lost 350 cc. at the time of delivery. After venesection there were no further convulsions and the patient drank freely. As she had incontinence it was difficult to estimate the exact quantity of urine satisfactorily, but 9,400 cc. was voided on the fourth day post partum. The maximum fluid given in 24 hours was 11,000 c.cm. The maximum temperature was 99.2°. The child was premature and though born alive died two days later. The urine at the time of delivery contained 7½ grms. of albumin per litre, but gradually improved though even at the time of discharge, 14 days post partum, it still contained a small quantity.

2778. M. N., aged 32, primipara (Dr. H. S. S.), was admitted on April 17, 1909, after having three convulsions at her home. At this time she was about 28 weeks pregnant. From the time of her admission no foetal heart sounds were heard and there was no evidences of the onset of labour, so a sweat bath was given, but the patient was nauseated and could retain no fluid. Three hours after admission there was a second very severe convulsion followed by deep coma, and as labour had not set in the cervix was drawn down and split in the median line anteriorly, and after the bladder had been pushed aside the cut was continued up into the lower uterine segment. An attempt was made to perforate the after-coming head but, as a result of this, the head was separated and there was considerable difficulty in extraction. After delivery the cervix was repaired very easily and the patient seemed in fair condition, but a couple of hours later had another severe convulsion; she was then bled 500 cc. From this time on improvement was marked, though, during the puerperium, she had two further convulsions which were, however, of an hysterical character. She developed a slight thrombosis of the veins of the left leg but made a good recovery and left the hospital in good condition.

Post Partum Eclampsia.

1401. A. T., aged 27, secundipara, was admitted on January 13, 1907. She had been confined about 12-15 p.m. on January 11th and was perfectly well till 5 p.m. on the 13th, when, after complaining of a severe headache, she had a convulsion which lasted a couple of minutes and was followed by deep coma. On admission the urine was 1,028, acid, and contained albumin and a trace of sugar. The patient was treated by hot air baths and large quantities of fluid. The maximum fluid given was 4,800 cc. and the diuresis was 4,800 cc. Maximum temperature 100·2°. The mother recovered; the child was alive.

1457. M. F., aged 20, primipara, was admitted on February 19, 1907. The patient had been confined about 3-30 p.m. on February 17; labour normal. About 3 a.m. on February 18 she had a convulsion which was followed by two others before she entered the hospital about 8 a.m. next day. The blood pressure was noted to be 150 mm. The patient was sweated and given large quantities of fluid; the maximum given 7,000 cc., diuresis 4,200 cc. The maximum temperature was 99·6°. The patient made an uninterrupted recovery.

1628. G. D., aged 30, secundipara, was admitted on May 21, 1907. She had been confined at 4 a.m. on the 20th and eleven hours later had a convulsion, followed within an hour by two further convulsions and coma which persisted for twelve to fifteen hours. The urine contained large quantities of albumin. On admission the patient was given a high enema, large quantities of fluid, and then sweated. Maximum fluid given 7,800 cc., maximum diuresis 5,800 cc., maximum temperature 100·4°. Improvement was immediate in this case and after the first twenty-four hours her condition was not serious; she left the hospital in excellent condition; child alive.

2373. A. K., aged 32, tertipara, was admitted on August 19, 1908. On examination the patient had marked œdema of the vulva and moderate albuminuria. The labia were incised and, as pains had started, she was

left to herself. After irregular pains for three days she gave birth spontaneously to twins. Six hours later the patient had a definite eclamptic convulsion and was immediately sweated. The stomach was washed out and magnesium sulphate, 2 ozs., and ammonium bromide, 20 grs., were given. After this she was quieter and slept during the morning. A further sweat bath was given during the afternoon, and, as the patient was somewhat nauseated, a continuous rectal irrigation of salt solution was started. The maximal quantity of fluid given was 4,000 cc., the maximum diuresis 5,500 cc., maximum temperature 99°. The patient's improvement was gradual but continuous and she left the hospital well; the children also did well.

2535. E. G., aged 28, primipara (Dr. W. G. S.), was admitted on November 28, 1908. The patient was delivered of twins on the 29th, and five hours after delivery had a severe convulsion; about fifteen hours later she had a further convulsion followed by coma of moderate duration. After an interval of three hours she had a third convulsion similar to the previous ones. The patient was given hot air baths which induced thirst and was then given large quantities of fluid. Maximum fluid 3,500 cc., maximum diuresis 6,300 cc.; the maximum temperature was 103°. The mother recovered, and the children did well.

2650. J. R., aged 20, primipara, was admitted on February 8, 1909. The patient had severe headache, some œdema of the feet, nausea and vomiting. The urine contained a large quantity of albumin, and on this account she was placed on fluid diet and the regular eliminative treatment. On the morning of the 11th, about 3 a.m., she was delivered spontaneously and was in good condition until four hours later when she had a severe convulsion. One hour later she had a second convulsion and was then given a sweat bath and 600 cc. of blood were withdrawn from the right arm. The urine at this time was very dark and contained a large quantity of albumin. Twelve hours after delivery the patient had a third convulsion and another sweat bath was given. At this time 620 cc. of urine was obtained by catheterization. In spite of evidences of improvement two further convulsions occurred, at 6 p.m., and at 8 p.m., after each of which sweat baths were given, and after the last a second venesection was done. The patient was very thirsty, drank very freely and voided involuntarily. The maximum fluid given was 7,800 cc. and the maximum urine 6,500 cc. The maximum temperature was 100.2°. This patient developed marked jaundice. Sweat baths were continued for the following two days and the patient eventually made an uninterrupted recovery; the child lived.

2674. J. T., aged 37, tertipara, was admitted on March 1, 1909. The patient was delivered spontaneously on March 2, and was returned to the ward in excellent condition. About twelve hours after delivery she had a severe convulsion followed by coma. A sweat bath was immediately given, and, as the patient's nausea prevented the administration of fluid, 550 cc. of blood were withdrawn from the forearm. The blood pressure prior to venesection was about 130 mm., after venesection it fell to 115 mm. In spite of the nausea fluids were then given freely, a maximum of 6,300 cc.; the maximum diuresis was 6,730 cc. Jaundice developed in this case, but in spite of this the patient made an uninterrupted recovery.

It is interesting to note that this patient at a previous admission had a similar attack about eight hours after the delivery of her child.

2719. S. F., aged 22, primipara, was admitted in March, 1909. The patient had a spontaneous labour on March 12, when she complained of severe headache and some dimness of vision. As her blood pressure registered 200 mm., a venesection was done and 550 cc. of blood withdrawn. This lowered the pressure to 122 mm., and, on the administration of forced fluids, the patient showed marked improvement until the 6th day, when with a blood pressure of 142 mm. she had a severe convulsion followed by deep coma. The urine at this time contained a large quantity of albumin and some blood. The maximum temperature was 100°. Sweat baths being given and the administration of fluid continued, the patient made an uninterrupted recovery. This patient had a history of previous epilepsy, but there was nothing by which her convulsions could be differentiated from a typical eclamptic attack. The result for both mother and child was good.

Mrs. W. (Dr. H. M. C.), aged 28, primipara, was delivered of twins on the afternoon of April 26, 1909. Late the same night she had a typical convulsion, and after a second convulsion the following morning, about seven o'clock, I saw her for the first time. She was very toxic and the pulse was full and bounding. Venesection was done without an anæsthetic and 650 cc. of blood were removed. The patient at this time was semi-conscious and after the bleeding slept during the greater part of the day, but was willing to drink freely when roused. She had been under treatment for some time prior to the confinement, and the kidneys, even at the time of the attack, were working fairly well. Diuresis was encouraged by the administration of large quantities of weak lemonade, and the patient made an uninterrupted recovery.

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