I also believe the same of another of the mothers whom I saw only in consultation. The fourth mother who died had not been under medical observation. She died probably from shock or from etherization or from hemorrhage, or, in other words, from too energetic treatment. Her baby survived.

Four premature babies were practically sacrificed where forcible induction of labor was employed, on the supposition that such treatment alone would save the mother's life. Twice this may have been true, but in two of these cases not even the mother was saved. In all the cases fortunately the father survived.

It may be presumptuous to attempt any deductions from such a record as to the proper treatment of eclampsia, especially as it is customary to base recommendations as to treatment only upon uninterrupted successes. Nevertheless, believing as I now do that the treatment employed was not theoretically right, I offer the following criticisms and conclusions:

(1) It is more important to keep account of the amount of urine excreted by pregnant women than it is to test it occasionally for albumin. And if the amount is scanty, prompt measures should be taken to promote diuresis; failing which, then catharsis and diaphoresis should be induced.

(2) In cases of eclampsia, before term, diaphoresis should be tried before resorting to the induction of labor. Hot air is the safest and most effective means thereto.

(3) In cases of eclampsia occurring at term, diaphoresis should be employed *while* inducing and expediting delivery.

(4) The rapid induction of labor by manual dilatation of the cervix is a difficult and dangerous operation, which if combined with forcible delivery of the child is well calculated to add to the shock already caused by the eclamptic attack.

(5) In eclampsia, as in all other cases of kidney failure, ether is contraindicated. Surgical anesthesia is not needed. Chloroform, always the proper anesthetic in obstetric practice, is imperatively proper in cases of eclampsia.

PUERPERAL ECLAMPSIA.¹

A STUDY OF ONE HUNDRED AND SIXTY CASES OCCURRING AT THE BOSTON LYING-IN HOSPITAL AND IN THE PRIVATE PRACTICE OF MEMBERS OF THE OBSTETRICAL SOCIETY OF BOSTON.

BY CHARLES W. TOWNSEND, M.D.,

Physician to Out-Patients, Massachusetts General, Boston Lying-in and Children's Hospitals.

THE following paper, which is offered as an introduction to the discussion of this subject before the Obstetrical Society of Boston, consists first, of a brief analysis of the 67 cases of eclampsia that have occurred at the Boston Lying-in Hospital in the last twelve years, and, secondly, of an analysis of 93 cases occurring in private practice collected from the members of the Society and their invited guests.

I. SIXTY-SEVEN BOSTON LYING-IN HOSPITAL CASES.

I have availed myself of the excellent paper by Dr. Charles M. Green published in the *American Journal of Obstetrics*, Vol. XXVIII, No. 1, 1893, for the cases

of eclampsia occurring at the hospital from 1885² to 1892, inclusive, a total of 36 cases. In the four years (lacking one month) since then, 31 more cases of eclampsia have occurred at the hospital, making a total of 67 cases; 48 of these, or 72 per cent., were primiparæ. Of the 67, 48 recovered and 19 died, giving a maternal mortality of 28 per cent.

This compares favorably with other statistics. Thus, Fothergill puts the mortality at 26 per cent.; Braun, of 73 cases, finds it to be 26 per cent.; Dohrn, of 747 cases, 29 per cent.; Dorland, 30; Kutenbach, 30; Hofmeier (104 cases) 32.4; Shauta, 36.5; Bailly, 42; Madame La Chapelle, 50; Pajot, 50.

The fetal mortality in the ante-partum and inter-partum cases, excluding the non-viable cases, is 24 per cent. out of 32. The following table shows the relative frequency and mortality in the three classes of puerperal eclampsia:

	Cases.	Per cent.	Per cent. fatal.
Ante-partum eclampsia . . .	29	43	38
Inter-partum eclampsia . . .	17	26	23
Post-partum eclampsia . . .	21	31	19

It is seen that the ante-partum cases are the most common and the most fatal; the inter-partum cases are less fatal; while in the post-partum cases the prognosis is the best. Coming now to a more particular consideration of the prognosis, we find that where marked coma was present, always considered an unfavorable sign, about one-half only, or 51 per cent., were fatal.

The average total number of convulsions in the 48 mothers that recovered was 5, the numbers running from 1 to 25. In the 19 that died, the average was 8.2, the numbers running from 2 to 24. It is, therefore, impossible in any given case to form a definite prognosis from the number of convulsions or the existence of coma, as a study of these cases shows that women have died after two convulsions and recovered after 25 and deep coma, although the general rule is, the fewer the convulsions, the better the prognosis.

The effect of the convulsions, or the condition which causes the convulsions, on the child, is also of interest. It is generally assumed that the toxemic condition with eclampsia and coma is, if prolonged, fatal to the child. The Lying-in Hospital cases do not bear this out. Thus, of 19 ante- and inter-partum cases (excluding the non-viable) that recovered, the number of convulsions in the mother averaged 4.8; of seven that died, the convulsions averaged 3.8. One child was born dead after only one maternal convulsion; while four children survived eight or more maternal convulsions, one surviving seventeen maternal attacks and was delivered alive while the mother was comatose. Forced delivery by version is, of course, responsible for the death of the child in several cases, without reference to the existence of toxemia. These cases, therefore, show that it would be unwise to assume that the child was dead even if the mother had had numerous convulsions and was comatose.

The treatment, to quote freely from Dr. Green, in these hospital cases has been essentially the same in all the cases, with minor differences owing to the member of the staff in charge, or adapted to the individual case. It should be remembered that the hospital patients are not received prior to the onset of labor; hence there is no opportunity to observe or relieve the various prodromal symptoms of eclampsia

¹ Read before the Obstetrical Society of Boston, December 15, 1896.

² Cases prior to 1885 are not included, as the aseptic system was not introduced until this date.

and thus to mitigate the severity of the attack or to entirely prevent it.

Moreover, it is the policy of the hospital to admit every case of eclampsia unless the patient is obviously moribund, and this latter rule is sometimes overlooked. Hence all of the anti-partum eclamptic cases were brought to the hospital after one or more convulsions, many of them after a dangerously long delay. Therefore, one would not expect as good results as in those watched in private practice and seen early in the disease.

In brief, the treatment has consisted of the following measures:

In *Ante-partum* cases, if the fetus is not yet viable, and the convulsions are few and mild, the attempt has been successful in a few cases to arrest the convulsions and restore the action of the kidneys by medical measures presently to be enumerated. In the majority of cases interference with pregnancy is practised by manual dilatation of the os and immediate delivery, generally by version.

In *Inter-partum* cases, labor is expedited by forceps, manual dilatation of the os and version being sometimes necessary.

In *Post-partum* cases the following medical measures are resorted to, which are also used to supplement or take the place of obstetric interference in the other classes: Ether during the eclamptic seizures and during artificial delivery. Hot-air bath or hot-water bottles, to excite the action of the skin. Pilocarpine, in doses of one-sixth of a grain, is often given subcutaneously. Elaterium or croton oil, the latter if the patient is comatose, to excite the action of the bowels. Acetate of potash and cream-of-tartar water as diuretics. Chloral and bromide by enema in some cases as sedatives. Morphine is not used, and venesection has been employed only a few times, although post-partum bleeding is encouraged rather than quickly checked.

II. NINETY-THREE CASES OF ECLAMPSIA FROM PRIVATE PRACTICE.^a

It seems to be a common impression that the mortality in hospital cases of eclampsia is higher than in private practice for two reasons: first, the patients are not seen until eclampsia often of some duration is actually in progress, no prophylactic measures having been used to mitigate its course; secondly, many desperate cases are sent to the hospital as a last resort. I was therefore somewhat surprised to find that the mortality in private practice was exactly the same, 28 per cent., 67 having recovered and 26 died of the 93 cases. The fetal mortality, 21 cases where this was noted, and the infant was viable, was 43 per cent., nearly twice as great as at the hospital; but the numbers are too few to draw any conclusions.

The relative frequency and mortality in the three classes of puerperal eclampsia, corresponds fairly well with the hospital statistics, except that the post-partum cases are less frequent and more fatal than the inter-partum cases, as will be seen by the following table:

	Cases.	Per cent.	Per cent. fatal.
Ante-partum eclampsia . . .	55	59	33
Inter-partum " . . .	22	24	18
Post-partum " . . .	15	16	26

^a The members furnishing cases are Drs. J. G. Blake, W. E. Boardman, F. H. Davenport, G. J. Engelmann, E. Reynolds, J. P. Reynolds, A. D. Sinclair, C. E. Stedman, J. B. Swift, C. W. Townsend, G. H. Washburn and A. Worcester; the guests, Drs. R. T. Edes, E. A. Bates and H. A. Wood, to all of whom I am much indebted.

Combining the two sets of statistics, the frequency of the three classes in the 159 cases is in the proportion of 53, 24 and 23 per cent., in the order given above; and the mortality is 34 per cent. in the ante-partum, 21 per cent. in the inter-partum, and 22 per cent. in the post-partum cases. As in the hospital, a large number that were comatose recovered, 41 per cent. proving fatal.

The correspondence in the average number of convulsions in those who recovered and those who died is almost exact. Thus, in private practice the average number of convulsions which ranged from 1 to 18 in those that recovered, was 4.1 against 5 in the hospital. In those that died, the range was from 1 to 20, and the average 8.2, — exactly the same as at the hospital.

As in the hospital cases, there seems to be no relation between the number of the convulsions and the condition of the child at birth, whether living or not. Thus, the average number of ante- and inter-partum convulsions where a living child was obtained was 3.2, the average number where the child was still-born being about the same, namely, 3.6. There were three children born dead where the mothers had each had only two convulsions, the cause of the death being probably the forced delivery, while one child survived nine maternal convulsions.

Dr. R. T. Edes reports three labors of one patient, twice at the sixth month and once at the seventh, in all of which there was eclampsia — from five to twelve ante-partum convulsions, forced labors, and two to six post-partum convulsions. The patient has had a healthy living child born since, without eclampsia. He also reports two other eclamptic labors in another patient, the patient dying in the last one.

Dr. C. E. Stedman reports two eclamptic labors in the same patient, who survived.

The treatment in the private cases collected, judging from the notes sent me, has been in the main essentially the same as the hospital treatment, namely, early delivery and the use of an anesthetic, hot-air baths, purgatives, diuretics and in some cases pilocarpine. The use of chloroform instead of ether is mentioned in only two or three cases.

Dr. J. P. Reynolds reports cases where ether to complete anesthesia was pushed for a long period. His results are certainly remarkable; for, out of twelve cases reported, only two died, and in both of these ether was not thoroughly given. I cannot help feeling, however, that he was particularly fortunate in these results, for series of eclamptic cases have occurred at the hospital where everything seemed powerless to prevent a fatal issue.

Theoretically, I cannot understand why the suppression of the convulsions by ether is going to cure the disease any more than the suppression of the cough in pneumonia would stop the progress of this affection. Both the convulsion and the cough are merely symptoms of an underlying condition. It also seems to me that ether by increasing the pulmonary congestion and cyanosis is helping rather than retarding the effect of the toxins towards a fatal issue. Certainly many of the fatal cases show in the last stages cyanosis and bronchial accumulation which can only be aggravated by ether. Chloroform seems the more rational agent to use.

Pilocarpine, it seems to me, by increasing the danger of bronchial accumulation should not be used in eclampsia.

The use of morphine is mentioned in nine cases by various reporters, two of these cases proving fatal.

Eight cases were bled, three proving fatal. One of these latter was a case of my own, where the patient was promptly delivered, but where the convulsions continued for two days post-partum until her death, notwithstanding every means that could be employed. Here venesection gave temporary relief. Copious bleeding, followed by intravenous salt-solution injections, would seem to promise good results.

The use of *veratrum viride*, as recommended by many practitioners in the South and West, is not mentioned in this collection of cases.

Clinical Department.

A CASE OF BULLET-WOUND OF THE HEAD.

BY A. T. CABOT, A.M. M.D., BOSTON.

C. H., fifty-five years of age, entered the Massachusetts General Hospital on October 25, 1892. Twenty hours before entrance he had shot himself in the left side of the head with a revolver, the bullet, of 32-calibre, entering just above the left temporal bone. He was a Swede, and talked but little English, but would answer "Yes" or "No" to simple questions.

An examination showed the characteristic wound of entrance of a bullet of the described size. This opening was situated one and a half inches above a line drawn from the external orbital process to the junction of the helix of the ear to the scalp, and was nearly over the centre of this line, being slightly nearer to the ear than to the orbital process. His eyes were moderately contracted, but reacted equally to light. At the time of entrance his temperature was 101.4° ; his pulse was 90, his respiration 36. He was seen soon after by Dr. J. J. Putnam, who made the following notes:

"The patient shows complete paralysis of the lower branches of the facial nerve, and difficulty in the movements of the tongue, also complete paralysis of the right hand and arm. Neither leg is wholly paralyzed, but both are equally weak. The knee-jerk is slight, but present at both sides. He is sensible to a prick everywhere. He seems to understand simple questions, and is apparently intelligent, but is evidently aphasic. His pulse is 84, respirations 27. He can swallow."

Dr. Putnam's opinion was that the lower Rolandic region, which lay close to the wound, was evidently seriously injured. How much further the damage extended could not be determined on account of the condition of general concussion. It was decided to operate with the object, primarily, of establishing drainage.

After thoroughly shaving and cleansing the head, the scalp was reflected and a trephine opening was made over the point of entrance of the bullet. A probe was then introduced through the opening in the dura mater, and, with the head turned on the side, was allowed to run by its own weight along the track of the ball. It slipped along easily until it encountered the falx, where it stopped abruptly, but a little gentle manipulation carried it through the opening and it then ran, by its own weight, directly across to the skull on the other side. By taking a probe long

enough to project considerably from the skull, while it lay in the bullet track, it was possible to sight pretty accurately the course of the ball. It was thus found that it had traversed the brain from side to side with an inclination backward; so that it must have struck the inside of the skull, on the other side, under the posterior part of the parietal eminence.

The probable point being determined by careful observation of the probe, a needle was thrust through the scalp, and, reflecting a flap, a trephine was put on; and when the button of the bone was removed, it was found that the probe from the other side touched the dura at the centre of the opening.

An incision was made in the dura, which had not been lacerated by the bullet. At once clots of blood and brain matter began to issue, and a probe, feeling about with great gentleness, demonstrated a cavity in the brain substance posterior to the opening. The finger was carefully introduced into this; the bullet was felt and, with a little difficulty, was seized and removed.

A drainage-tube was introduced into the cavity where the bullet had lain, and another small one was slipped just within the wound of entrance.

The patient gradually failed, and died twenty-four hours after the operation.

The interesting point in this case is that the method adopted succeeded in so accurately locating the point of the probe on the opposite side of the head. The probe was sighted while looking at the head first from the top and then from the side, and in each position a line was drawn passing around the head in the same plane with the probe and the eye. The point of intersection of these lines on the opposite side gave the position of the distal end of the probe. Fortunately, the bullet had not ricocheted after striking the inner surface of the skull, and was found close to the point of impact.

Patients often recover with an injury of the brain as extensive as seemed to exist in this case; and it would seem possible that had this patient come to operation earlier, the result might have been more favorable.

A BULLET-WOUND OF THE BRAIN.

BY DAVID DANA SPEAR, A.M., M.D., FREEPORT, ME.

On December 30, 1896, a little child, twenty-one months old, was accidentally shot with a bullet from a .22-inch calibre revolver. The missile entered the head on the posterior left side about midway between the upper part of the left ear and the occipital protuberance. The direction of the line of entrance was diagonal. There was no wound of exit. Matted hair, looped, two and one-half inches in length, was taken from the wound; so that it must have been of at least that depth, and how much more is unknown. The wound was not probed.

Immediately after the shot the child fell to the floor, apparently dead; but after a few moments began to breathe irregularly. An hour later she was seen by the writer. The condition was one of severe shock and concussion; both pupils were contracted to a small point and were inclined to roll upward.

Two-hours later she was seen by Dr. Twitchell, of Portland, who concurred that the wound should not be probed to find the bullet. The condition of concus-