

bandage can be removed in from two to three minutes, and in five minutes more a fresh plaster-of-Paris bandage, consisting of two bandages for the leg, and three, or at the most, four, when the plaster extends to the middle of the thigh, can be re-applied. This is quite different from the method of sawing the plaster-of-Paris bandages, which frequently occupied twenty minutes to half an hour. This application of light plaster-of-Paris bandages, and their easy removal, is, to our minds, a very important point in the management of compound fractures, as it enables the surgeon at any time to see what is going on inside the dressing.

We rarely if ever re-apply a cut-up plaster after it is entirely removed from the limb. Greater security is afforded the limb by the application of a new and complete circular plaster-of-Paris bandage. A rise in temperature and pain in the limb still remain the cardinal reasons for the removal of a plaster-of-Paris bandage. We disregard a rise in temperature to 100° or 101° for the first three or four days; but after the first forty-eight hours, severe or constant pain in a fracture, whether it be simple or compound, is a symptom that we never disregard, and requires a careful investigation as to its cause. Frequently the simple division of the plaster in front is a relief to the pain. The plaster can be held together by straps and buckles.

Formerly if a plaster-of-Paris bandage leaked through, we changed the dressing. Now, however, we re-inforce the plaster-of-Paris bandage at the point at which the leak first occurs, by applying an antiseptic dressing outside of this. In case we find marked bowing or lateral displacement in a compound fracture at the end of a fortnight or three weeks, it is corrected by suitably applied pads, and if necessary tenotomy of the tendo-Achillis under an anæsthetic. Occasionally we resort to the use of Smith's anterior splint, or a fracture box, and the best of these is Dr. Bolle's.

In managing a compound fracture in an alcoholic there is nothing more satisfactory than to place it in a plaster-of-Paris bandage for protection. He can then thrash about without destroying his limb. Even in the most hopeless cases, where delirium tremens, pneumonia, or uræmia complicate a compound fracture, the practitioner should never forget that the plaster-of-Paris bandage requires changing at appropriate intervals of time. Unless this precaution is taken, a limb with backward or lateral displacement of the fragments may come out of the plaster-of-Paris bandage at the end of six weeks.

(4) *Prognosis.* — The restoration of the limb to usefulness is a matter of great interest. Although pus, sloughing and necrosis all hinder the rapid recovery of the patient, the patients almost always have useful limbs. So far as our investigation has led us we have found only two cases with useless limbs. One is possibly due to acquired flat-foot from the injury; the second is a forearm, where after a compound fracture of both bones, without extensive destruction of the soft parts, non-union and a "dangle" limb is reported. Primary amputation was advised in this case. In a number of cases amputation of the limb was advised, and yet the patients recovered with useful limbs. This has led us to be extremely careful about advising a primary amputation.

Lateral displacement and backward bowing of the leg are the common deformities in adults, but not in

children. The danger from sepsis is very slight; although there has been pus in a small number of our 160 cases, yet there has been no death from sepsis. There have been two cases of death from tetanus, and one from fat embolism.

The prognosis of a compound fracture of the limb depends upon the same considerations that determine whether the limb shall be amputated or not. Extensive crushing of the soft parts hinders the restoration of the limb to usefulness fully as much as necrosis of the bone. If at the end of six months a sinus remains, and loose fragments can be detected, an operation for their removal is indicated.

In short, we have come to regard the prognosis of compound fractures as very favorable. As an example of the confidence which is felt by one surgeon in the treatment of compound fractures, we may say that he has told us that if he had a "simple complicated" fracture, which was attended by much pain, he should not hesitate to have it converted into a compound fracture, that the cause of the pain might be determined, and, if possible, remedied. This is, perhaps, too confident a view to take of a compound fracture; but it illustrates the marked change in results which has occurred.

Conclusions. — (1) That every compound fracture of the thigh, leg, arm and forearm should be rendered scrupulously, surgically clean, and should be absolutely immobilized.

(2) That this immobilization is conveniently attained by the light, circular, plaster-of-Paris washed bandage.

(3) That a plaster-of-Paris bandage should not be allowed to remain on a limb over a fortnight in the first month of treatment of a compound fracture, as backward bowing and lateral displacement can be avoided by this precaution.

(4) That while pus, slough, necrosis or deformity may exceptionally occur, yet the rule is, union by first intention, and the early restoration of limbs to usefulness.

ANALYSIS OF TWENTY-FIVE CASES OF HYDATIDIFORM MOLES.¹

BY GEORGE A. CRAIGIN, M.D.

THE object of the following paper is to introduce the subject of hydatidiform moles.

The disease is a rare one; yet few men of large experience escape without a case or two, and the gravity of the trouble, its varying manifestations, the difficult diagnosis, and the necessity for prompt, energetic, yet well-considered treatment, all give it importance.

Without attempting to present a review of the literature on the subject, I have collected twenty-five cases reported recently, and have tabulated them for comparison with the stereotyped clinical picture given us in the text-books. The exact figures can have little importance, especially as the reports have been made by so many different men, and with such varying degree of accuracy and detail. Yet in a general way a good deal can be inferred from such a table; and as no individual is likely to have enough cases to enable him to generalize, it is hoped a collection of this kind may be useful.

¹ Read before the Obstetrical Section of the Massachusetts Medical Society, and recommended for publication by the Society.

Pathology.—The pathology, while interesting and the subject of much discussion, may be dismissed with a few words, as our object is strictly clinical. According to the generally accepted theory, the hydatidiform mole is always developed from an impregnated ovum. The characteristic is an abnormal development of the chorionic villi, usually at the expense of foetal tissue. These villi undergo a myxomatous degeneration, there being formed cyst-like enlargements of the villous tubes varying in size from a pin-head to a walnut. These, branching from one another, with thread-like connections, resemble bunches of grapes or currants. The cysts are generally translucent, and contain a slimy fluid in which is a certain amount of mucin. The proportion between mole and foetal tissue varies, but three types are recognized:

(1) Where there is a foetus contained in an amniotic sac.

(2) Where there is still an amniotic sac with perhaps traces of a cord.

(3) Where there is nothing but the hydatidiform mass.

As the placenta is naturally formed toward the end of the third month, the myxomatous degeneration must necessarily begin during the first three months, since the placental tissue is never the seat of this change. In its formation the decidua takes the usual course, and envelopes the mole. The villi are embedded in the maternal tissue—at times penetrating even to the peritoneal covering. From this there follow some important points: (1) The uterine wall may be greatly weakened. (2) There is chance of tremendous hæmorrhage on separation of the mole from the uterus owing to the intimate relation between villi and uterine sinuses. (3) Parts may be left embedded in the uterine wall with increased danger of hæmorrhage and sepsis.

Etiology.—The etiology is still obscure. The following facts, however, are suggestive: The mole occurs more frequently—(1) in multiparæ, especially where pregnancies have followed in rapid succession; (2) between the ages of twenty-five and forty; (3) where there has been preceding molar pregnancy; (4) where there is syphilitic or cancerous dyscrasia; (5) where there has been endometritis. The last is especially emphasized by Virchow, and is perhaps often the important factor in the other conditions mentioned. The frequency of occurrence is not well determined, the estimates varying from 1 in 20,375 (Boivin), to 1 in 532 (Charity Hospital, Berlin). The probable average is about 1 in 3,000. The maternal mortality has been estimated at 13 per cent.

The foetus at best is feeble. The mole, though generally expelled before the seventh month, may be carried far beyond term or after a living child. Boivin reports one at fourteen months, and there is a report of two at five and six years. The size may reach that of a child's head. In multiple pregnancy there may be a mole and a healthy child.

The usual course of the disease, as laid down in the text-books, is something as follows: Pregnancy is recognized. The uterus increases rapidly in size, out of proportion to the time. There is usually a vaginal discharge of watery or thin bloody fluid about the third month, and after, at times containing the cyst-like bodies. There may be occasional hæmorrhages later. The feel of the uterus is doughy except in its lower segment, which is peculiarly tense. A sense of

fluctuation is rarely obtained. There is no *ballotement*. No foetal heart can be heard. Foetal parts cannot be felt. Foetal movements are absent. Abortion occurs before the sixth month as a rule.

As diagnostic points of especial value, are mentioned: (1) Rapid growth of the uterus; (2) absence of signs of foetus; (3) discharge of bloody water with cysts—the pathognomonic sign,—(4) and tense lower segment.

Absence of reflex symptoms is regarded as important by some. The impression given by the usual description is that the clinical picture is quite well defined, and diagnosis should be fairly easy.

The result of tabulating the twenty-five recent cases was as follows: I found that the age varied greatly, and was younger than it is generally estimated, being on the average about thirty years. The oldest was fifty-five, the youngest twenty, though in reading I came across one at eighteen years. The number occurring among the earlier pregnancies was also a surprise. Out of the twenty-five there were six in their first, three in their second, and three in their third pregnancy. Thus one-quarter were primiparæ, and nearly one-half as early as the third pregnancy. Eight had had previous abortions. Three had aborted once: three twice (in one case a mole each time); one three times (one a mole), and one four times.

Little else was noted among predisposing causes. Specific history was seldom found. In fourteen it was stated as absent; in six not stated; and in the remaining five doubtful. Cancer was not mentioned, neither was endometritis. This, of course, has very little significance, meaning simply that the reporter had not inquired into it. The length of time the mole was carried varied from eleven weeks to seven months, with an average in twenty-two cases of four and a half months.

Among the ordinary signs of pregnancy the condition of the breasts was noted in seven cases. Of these three were small or flabby, though one had pigmentation of the areolæ. Four were enlarged; one without, the others with pigmentation. In one or two the enlargement of the papillæ was especially noted. One had milk. The characteristic bluish discoloration of the labia was mentioned in one case. Nausea and vomiting was a marked symptom, occurring in ten out of twenty-five. In six of these it was very severe. As a rule, it appeared early, sometimes at the very beginning, and became more and more distressing. It was present in each of three cases where the uterus was tender, being in proportion to the amount of tenderness. The uterus had enlarged very rapidly in these three, and in most of the other cases with nausea. Nausea was more frequent in the first and second pregnancy. Salivation occurred in but one. Abdominal pain was a symptom in two; in one coming on in paroxysms from side to side, in the other intermittent, and apparently owing to uterine contractions, as it was always accompanied by blood or watery fluid. In two cases the patients were very positive that they felt life. One was delivered at the end of the fourth month, the other in the middle of the fifth. The size of the uterus was mentioned in fourteen cases. Of these, thirteen were larger than normal for the period. One was smaller—a case where abortion was induced at the fourth month for uræmic convulsions.

A deceptive feeling of *ballotement* and an indistinct sense of fluctuation were noted in one case—delivered

early in the fourth month, the uterus reaching to the umbilicus. The doughy, boggy feeling was mentioned only once. There was no œdema in this case. A distinct bruit was mentioned in one, like the placental sound. (Edema was mentioned in six out of the twenty-five. It was generally of the ankles, legs, genitals and abdomen, but was found once in the hands. In only two cases of œdema was albuminuria noticed. One of these died from hæmorrhage and uræmia—the duration of pregnancy not known. The other had uræmic convulsions, but was delivered rapidly in the fourth month and lived. Uræmia and albuminuria were not mentioned in the other twenty-three cases.

In six cases there was no vaginal discharge prior to the hæmorrhage at the time of delivery. The average duration of these cases was four and a half months. In all but one of them the abortion began with a severe hæmorrhage without any warning. The one exception was delivered spontaneously at four months and ten days, with the decidua intact, enveloping the mole. In but one of the twenty-five cases was there at any time a watery discharge. This was "like amniotic fluid," but alternated with blood. It appeared at the third month. A fœtus thirty centimetres long was expelled with this mole at five months. Watery blood was noted in four only. In one it appeared at the sixth week, and was slight but constant the remaining six weeks. In one it was constant from the beginning, but slight and lasted four months, when the patient was delivered for eclampsia. In two there was a slight, intermittent flow for about six weeks.

In fifteen cases the flow was apparently not enough unlike an ordinary discharge of blood to be noticed as such. Six of these had a *constant* flow beginning between the third and the sixth month, and lasting from three to eleven weeks. In two the amount lost was large enough to seriously affect the general health.

In five the flow was intermittent, appearing between first and sixth months, and lasting from two weeks to five months. In one the amount lost was considerable.

In three the flow was intermittent to begin with, but became constant, and considerable in amount. It began between the fifth and eighth week, and lasted one to three months. The time when the discharge appeared was noted in sixteen. It ranged between the fourth and twenty-fourth weeks, the majority (nine) being between the sixth and twelfth. One flowed apparently from the very beginning.

In not one case were cysts noticed in the discharge. Clots were mentioned in one, and a few shreds in another. In one, on using the speculum a small mass of cysts was found protruding from the os; and in another, after ergot had been given, a few came away.

The notes on the cessation of menstruation were rather meagre, but from what I could learn the flow often stopped entirely as in normal pregnancy, although perhaps a comparatively large number had irregular or imperfect menstruation for a month or so. In one case menstruation went on as usual until a month before delivery, when intermittent and later constant hæmorrhage set in. This was in the fatal uræmic case; and she must have been several months pregnant, as the uterine tumor extended two or three fingers' breadths above the umbilicus.

The number in which hæmorrhage was profuse, either just before or during expulsion, was comparatively large—seventeen out of twenty-five. Of these thirteen occurred before any treatment could be given,

six being very severe. During treatment and before complete expulsion, four bled profusely; but in every case after the uterus was empty its walls contracted well, and hæmorrhage ceased. The condition of the cervix at the time of the last examination (just before treatment was begun) showed that in almost every instance very little change had taken place, even when there had already been profuse hæmorrhage. In all the primiparæ the os was tightly closed, the cervix long and often "dense." In the others "slightly patulous," "admitting one finger," rarely "two fingers," or "slightly dilated."

The following incident is instructive: A tampon was put in for slight hæmorrhage, the patient a multipara. On removing the tampon eight hours later, the os admitted a finger tip. The doctor went away, and returning seven hours later found the patient nearly moribund from an enormous hæmorrhage. The os was but two centimetres in diameter.

A small placenta was mentioned in three instances; and curiously enough all were of the placenta prævia variety.

One patient began with what appeared an ordinary abortion, and was delivered of a dead three-months fœtus with membranes (nothing said of placenta). Hæmorrhage and pains continued, and the next day a large hydatidiform mole was expelled. In another a dead fœtus thirty centimetres long was expelled with the mole. The placenta (a prævia) was small and bloodless. The decidua was intact, or nearly so, in two, in both of which hæmorrhage was slight. They were delivered at three and four and a half months.

The manner of expulsion varied greatly. In four the whole mass was expelled from the uterus without any assistance, and but one was accompanied by hæmorrhage of any account. In such it is fair to infer that the villi did not enter deeply into the uterine tissue. All made a good recovery, and none were earlier than the fourth month. Three started in spontaneously, but the expulsion was incomplete, and had to be finished by the curette or hand *in utero*. Of these all had considerable hæmorrhage. One made a slow recovery, owing to the necessity of irrigation and curetting for ten successive days before all was removed. They ranged between four and five and one-half months. Six were dilated by instrument or by the hand, and the uterus was emptied immediately. Only three of these had much hæmorrhage at the time. The only one with slow recovery bled little at the operation, but had lost considerably for a month.

Ten cases were treated first by tampon, ergot, or the two combined; and all but two had to be finished by the curette or hand. In one, Créde's method of expression was used successfully with an os two centimetres in diameter. This patient was the one mentioned as having bled after removal of a tampon. She died later of sepsis. Two of the ten made a slow recovery; one from sepsis due to retained fragments, where the curette was not used, reliance being placed on glycerine plugs, ergot, and douches. This was one of the cases with dead fœtus. The other slow recovery was due to the effect of hæmorrhage which was very great, owing to delayed treatment. The patient refused instrumental interference till hæmorrhage was alarming.

One patient had a spontaneous delivery after pains had been started by the passage of a sound.

Three died:—one undelivered, probably from hæmorrhage and uræmia (no convulsions); one from sepsis

on the seventeenth day; one, five months after delivery, from a papillary epithelioma of the uterus, which pathological examination showed to be due in all probability to the retained villi. This patient was the oldest, being fifty-five years.

From a consideration of the preceding summary the following points seem worthy of emphasis:

(1) Primiparae are not rarely affected; and the average age is younger than generally estimated.

(2) There may be present any of the ordinary changes of breast, labia, etc., found in normal pregnancy.

(3) There is medico-legal importance in the following: *a*, origin from impregnated ovum only; *b*, the placenta once formed is never the seat of this myxomatous change; *c*, the mole may be carried beyond term or after a living child; *d*, the appearances after delivery of a mole may be indistinguishable from those after child-birth.

(4) Reflex symptoms of nausea and vomiting common to pregnancy, so far from being absent or rare, are rather frequent, and as a rule are early, severe, progressive.

(5) There may be œdema without albuminuria. Schul, who has recently made a study of the relation of albuminuria to hydatidiform mole, finds that while it does not occur oftener, it generally appears earlier than in normal pregnancy.

(6) Uræmia may be a complication, and, with convulsions, is amenable to the same treatment as in pregnancy.

(7) Too much stress has been laid on the so-called characteristic discharge of thin watery blood, with occasional cysts. For while in the cases cited the flow may not have been pure blood, it was so nearly that in a large proportion of cases, that no distinction was noted. Therefore, any vaginal discharge, watery or bloody, slight or considerable in amount, intermittent or constant, and without cysts, is perfectly consistent with hydatidiform mole.

(8) Sudden hæmorrhage, sufficient to cause grave general symptoms, is frequent; as also exhausting intermittent flow.

Diagnosis.—The diagnosis in a considerable number of cases will not be made because there is nothing but a rather large uterus to make the patient suppose her pregnancy abnormal, until severe hæmorrhage sets in. In most cases the diagnosis in the early months will be almost impossible, although vaginal discharge, enlarged uterus, and possibly reflex symptoms, point to the uterus as the seat of some pathological process. The differential diagnosis will very likely have to rest on the passage of a sound; and unless cysts are brought away even that cannot ensure certainty. Even in those cases where the uterus has reached such a size that one could look for signs of a fetus, there must often be great uncertainty, particularly as it is possible to have a living child. And when there is no fetus the placental bruit, the feeling of life by the patient, with the *pseudo-ballotement*, are all misleading; and more so if there is a small placenta prævia, or an intact decidua with clots, which must give a placental feel. Again the uterus may be smaller than normal for the period. And menstruation may be regular for several months.

On the whole, then, it is evident that while diagnosis may be exceedingly easy, it must often be difficult if not impossible. There is not a sign or symptom

ordinarily mentioned as diagnostic that may not be absent, and these cases show, if nothing else, the folly of relying on any one sign or especial group of signs.

Treatment.—When diagnosis cannot be made these cases must be treated on general principles, and it must often happen that nothing is done until hæmorrhage, exhausting nausea and vomiting, or convulsions indicate the immediate emptying of the uterus. When once the diagnosis is made the following points have important bearing on the treatment:

(1) The patient is liable to repeated hæmorrhages sufficient to cause grave general disturbance, and to sudden severe hæmorrhage.

(2) A closed rigid os is almost the rule even after severe hæmorrhage.

(3) The mole can be delivered without complete dilatation, and with no more loss of blood than is almost certain to follow later, when it may not be easy to interfere.

(4) The uterus contracts well after being emptied, even when pains have not been present before dilatation was begun.

(5) Uterine stimulants and tampons will generally have to be supplemented by the hand or curette.

(6) Tampons with delay increase the danger of infection.

(7) Incomplete expulsion makes hæmorrhage and sepsis liable.

(8) The possibility of a thin uterine wall should be borne in mind when the curette, the hand *in utero*, or Crêdè's method of expression are used.

In the light of the above facts the proper course to be followed is clear. The uterus should be emptied as soon as possible. Just how to begin this however, may be a question. To rely entirely upon tampons, colpeurynter and ergot would be poor practice. The process is slow and imperfect; hæmorrhage and exhaustion greater. Yet in cases with rigid os and long dense cervix, undoubtedly the firm vaginal tampon is a most effective means of starting up pains, and getting a soft and dilatable os. It has another advantage, that of controlling hæmorrhage to a considerable extent during dilatation. Nevertheless the patient should not be left for any length of time without skilled attendance; for even if there is no leaking by the plug there may be concealed hæmorrhage. It is very dangerous to leave after removing the tampon, no matter how small the os.

The use of ergot before the uterus is empty has been recommended by many, but it must be as objectionable here as in the third stage of labor. In any case, as soon as the cervix will permit a rapid dilatation by hand or instrument, this should be done under ether, and the uterus emptied rapidly and completely by the hand or curette. And it should be remembered that complete dilatation, while desirable, is not necessary, for the soft friable nature of the tumor allows its removal with curette alone through a comparatively small canal. The possibility of thinned uterine wall must be kept in mind.

During the operation hæmorrhage is generally profuse, but as it almost invariably stops with the complete removal of the mass the only thing to do is to get through as quickly as may be. Of course before starting in, every preparation should be made for this hæmorrhage, and such means should be on hand as the operator is accustomed to provide in case of post-partum hæmorrhage. The uterus once empty behaves like

that after child-birth, and the principles of treatment are the same. An antiseptic uterine douche must always be given if instruments or the hand have entered the cavity.

The mortality in this series is fairly low (three in twenty-five), especially when it is considered that one patient was almost beyond all help before being seen; another died five months later of secondary cancer, leaving one to accounted for by septicaemia. It would seem, then, that with treatment early and prompt enough to prevent long-continued hæmorrhage, and with careful antiseptics, the prognosis should be better to-day than it was when most of the statistics were made out.

Dr. S. H. Ayer, not being able to be present, has kindly sent a specimen of a large hydatidiform mole with the following history.

"The patient, an Irish woman, twenty-five years old, was confined with her first baby May 22, 1891. Her menstrual periods returned in about two months after this date and appeared regularly until January 10th of this year. From this date to May 4th there was no menstrual flow, the patient during this time exhibiting all the symptoms of early pregnancy. On the latter date there was quite a copious flowing, which, however, subsided in three days. A few days later it began again and continued without interruption until June 3d, at which time the accompanying specimen was passed after very severe uterine pains lasting about twelve hours. The four weeks of flowing was unknown to me, the patient not having notified me. There was no pain whatever until twelve hours previous to the expulsion of the mole. Up to the present time the patient has been doing uninterruptedly well."

BIBLIOGRAPHY.

- Rosenthal, E. Jour. Am. Med. Ass., 1888, x, 255.
 Fruitnight. Am. Jour. Obst. N. Y., 1890, xxiii, 54.
 Phillips. Tr. Obst. Soc. Lond., 1891, xxxii, 65.
 Oliver, J. Lancet, Lond., 1889, ii, 592.
 Wilson, J. T. Ann. Gynec. and Pæd., Phil., 1890-91, iv, 469-473.
 Martin, J. W. Edinbg. M. J., 1891-92, xxxvii, 750.
 Bressler, F. C. Maryland M. J., Balt., 1891-92, xxvi, 206.
 Shattuck, G. B. Bost. M. & S. J., 1888, cxix, 358.
 Schul. Archiv. de Toccol., Paris, 1891, xviii, 438.
 Busecarlot. Archiv. de Toccol., Paris, 1890, xvii, 792.
 Marsh, J. P. N. Y. M. J., 1888, xlviii, 93.
 Takaki, K. Sei-I-Kwai M. J., Tokyo, 1888, vii, 107.
 Smith, T. C. Jour. Am. Med. Ass., Chic., 1887, ix, 686.
 Murphy, P. J. Jour. Am. Med. Ass., 1888, x, 469.
 Warman, N. Cent. f. Gynæk., 1892, No. 19.
 Rosser. Cent. f. Gynæk., 1886, x, 542.
 Kohn, H. All. Wien med. Zeit., 1886, No. 37.
 Dunning, L. H. Ann. Gynec. & Pæd., 1890-91, iv, 671.
 Williams, J. Schmidt's Jahrb. d. Med., 1877, 173, 204.
 Von Meyer. Archiv. f. Gynæk., xxxiii, 53.
 Champlin, A. P. Gaillard's M. J., N. Y., 1886, xlii, 602.
 Davis, C. W. Cincin. Lancet, Min., 1877, n. s., xviii, 695.
 Chadwick, J. R. Bost. M. & S. J., 1887, cxvi, 258.
 Chadwick, J. R. Bost. M. & S. J., 1890, cxxiii, 423.

SPINAL BIRTH PALSIES: A STUDY OF NINE CASES OF "OBSTETRIC PARALYSIS."

BY CHAUNCEY REA BURR, M.D., PH.D.

Assistant Physician, Department for Nervous Diseases, Boston Dispensary.

DURING the past twelvemonth at the Children's Hospital, through the courtesy of Dr. Bullard, I have had the opportunity of examining eight cases of so-called "obstetric paralysis." I have also the notes of one case occurring at St. Mary's Infant Asylum, Dorchester.

¹ Read, by invitation, before the Obstetrical Society of Boston, May 7, 1892.

All of these cases are representative of a type which is by no means common, and which is scarcely touched upon at all in current neurological literature. As the conclusions which I have reached respecting its etiology are at variance with those of well-known observers, I have thought a statement of them might be not without value.

As commonly seen, there is more or less loss of power in the whole upper extremity—generally the right—with paralysis of certain muscles and groups of muscles. This is always associated with a history of difficult birth. The arm hangs listlessly by the side, with the olecranon to the front. The forearm is prone, the thumb flexed across the palm, and the fingers folded over it. The muscles are flaccid. Occasionally, if the child is old enough, some wasting and shortening can be noticed, and rarely a duskeness and unusual heat or cold. The motions of flexion at the elbow, and lateral extension (that is, extension from the side), were lost in all of these cases. The power of extending the fingers was also lost in all but one case. Extension of the forearm on the arm, and flexion of the fingers, was retained in nearly all. Sensation was unimpaired in all those cases where it was tested for—five in all. The latissimus dorsi, teres major and subscapularis were operative in all; and their unopposed action resulted in rotating the humerus inwards. The rhomboids, supraspinatus and infraspinatus were paralyzed in several instances, and the scapula, in consequence, relaxed and unduly prominent. The cases follow:

CASE I. Children's Hospital, Out-patient Department, June 8, 1891.

B. W., five years old, second child. Head presentation. Mother in labor two days and a half. Forceps. Paralysis noticed immediately after birth. The right upper extremity is paralyzed; the arm rotated inwards, the olecranon to the front; the forearm prone. There was no grasp at first; there is a good grasp now. Sensation is normal. The motions of flexion at the elbow, lateral extension, supination, and extension of the fingers cannot be performed.

Analysis.—The internal rotators of the upper arm are the teres major, subscapularis and latissimus dorsi, all of which are supplied by the subscapular nerves. The external rotators of the upper arm are the infraspinatus and teres minor, supplied respectively by the suprascapular and circumflex nerves.

Since the arm is constantly held in the position of internal rotation, there must exist, to account for this, either spasticity of the internal rotators, or loss of power in the external rotators. The former are contracted, but there is nothing spastic about them; the latter are never moved, and are flaccid. This, therefore, is the paralyzed group.

The nerves supplying these muscles, namely, the suprascapular and circumflex, are both branches of the posterior cord of the brachial plexus. Since their function is impaired, one would also expect, *a priori*, that the remaining muscles supplied by branches of the posterior cord would also be impaired. This appears to be the case, since neither arm nor forearm can be extended nor supinated. The muscles employed in these movements are all supplied by the musculo-spiral nerve or its branches, itself a branch of the posterior cord.

The biceps, coraco-brachialis and brachialis anticus are all paralyzed, since flexion at the elbow is lost en-