

GUNSHOT WOUND OF THE BRAIN THROUGH THE MOUTH.

BULLET REMOVED ON THE SIXTY-NINTH DAY THROUGH
THE VERTEX; RECOVERY.

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THE following case appears to have sufficient interest, both clinically and physiologically, to deserve a detailed record.

On Sunday, Nov. 20th, 1898, I was asked by Dr. A. H. Cook of Hampstead to see a man who the day before had discharged two shots from a small bore revolver into his mouth in a direction upwards and backwards. He was sitting up in bed bleeding moderately from the right nostril, was perfectly conscious and very intelligent, and only complained of slight general pain over the right side of the head. His pupils were normal and there were no paralytic symptoms except a slight droop of the right eyelid, which was also slightly ecchymosed. There was a round hole in the hard palate just to the right of the middle line, two inches from the edges of the incisor teeth, and this was still bleeding. After the injury he had walked to the pond on Hampstead Heath, washed his face and hands, and subsequently went to the police-station to deliver himself up with the revolver. The latter carried a seven-millimetre bullet of about 45 grains weight. The notes kindly furnished to me by Dr. Cook show that when first seen by him immediately after the injury on the day before I was consulted the patient's condition was as above except that the bleeding from the nostril was so free that Dr. Cook plugged it and the patient had vomited some blood. When I saw him I advised that the plug should be removed from the nostril and that the latter should be dusted with iodoform powder as well as the wound and that he should be kept quiet in bed with ice to his head. The question as to the propriety of searching for the bullets I strongly negatived on every ground as they appeared so far to be doing absolutely no harm even if they had given any indication of their position, which was not the case.

Dr. Cook's notes on the next day (Nov. 21st) show that no change had taken place and that the droop in the right eyelid remained. The sight of both eyes was good and the pupils were normal as well as the mental condition. The temperature on admission was 97° F., the pulse was 72, and the respirations were 20. On Nov. 22nd the temperature was 100°, on the 25th it was 99°, and then normal while the patient was under Dr. Cook's care.

When I again saw the patient on Nov. 25th (the sixth day of the injury) there was no change except that the patient was more cheerful and quite well but for a slight headache on the right side. Dr. Cook's last note on Nov. 25th is as follows: "No more vomiting; no paralysis; sensation normal." The patient had vomited about a dozen times while he was at Hampstead. On the 27th he went home apparently well. On Dec. 4th he went to stay with friends at Highgate and was observed to look ill and weak. On Dec. 6th (the eighteenth day after the injury) he began, as he stated, to vomit six or eight times daily and continued to do so until admission into University College Hospital on Dec. 20th at the request of Dr. Bates, who, meanwhile, had been called to attend him. On Dec. 16th (the twenty-eighth day after injury) he first noticed weakness of the left arm and leg, which increased until admission four days later (Dec. 20th). The following notes were then made by my house surgeon, Mr. P. G. S. Williams: "Dec. 20th, 1899. —, aged 29 years, of slight build and highly intelligent. Lies in bed mostly on his right side; is not able to walk or stand without support owing to paresis of the left leg. The left arm is also powerless and he is unable to raise it from the bed. The dynamometer shows 70 grasp on right, against 33 on left. The lines on the left of the face were thought to be a little less marked than on the right and the tongue to deviate a little to the left. The pupils were equal and small and reacted to light. Intense optic neuritis with hæmorrhages was found by Dr. Percy Flemming in the right eye and less in the left. Knee reflexes were increased on both sides and ankle

clonus was present on the left. There was slight tenderness on percussion over the right parietal bone. Urine normal; intellect perfectly clear. On admission (thirty-second day) the patient vomited at once, but without nausea, and this was repeated several times daily as a rule, with the exception of the thirty-sixth, thirty-seventh, thirty-eighth, and fortieth days. On the forty-first day he vomited twice and on the forty-second day only once. After this he did not vomit at all until the operation on the sixty-ninth day. The temperature on admission was 99·8°, the next day 100°, and after that until the rise before the fits on the sixty-sixth day it ranged from 97·6° to 99° in the rectum. At no time were there any twitchings or fits though a constant watch was kept for them."

From the day of admission onwards until the sixty-sixth day there was steady improvement. The vomiting ceased after the forty-second day, the pain in the head disappeared, and the paresis of the arm and leg improved so that soon the patient was able to get out of bed and to walk with help. The optic neuritis also became less intense, though a considerable amount of retinitis, in addition to the papillitis, remained, and in the opinion of Dr. Percy Flemming (who was watching the condition of the eyes with interest) far more than appeared compatible with the return to more normal intracranial conditions which the improvement of all other symptoms appeared to suggest. Under these circumstances I still thought it out of the question to interfere with the bullets by operation, although by this time I knew clearly that one lay in the centre of the brain. I had had two skiagrams of the head made, one from the side and the other from the front. Both these showed the two bullets well. One lay somewhere near the body of the sphenoid extra-cranially and the other exactly in the middle of the brain. By careful measurement from the glabella to the external occipital protuberance I found that the latter bullet lay directly under a point midway between the two and at a depth of about one and three-quarter inches from the surface of the skull. Allowing, then, for the difference in size between the patient's cranium and its shadow the bullet ought to have rested on the corpus callosum at about two-fifths of the distance from its anterior end, and ought to have rested against the lower border of the falx cerebri one-eighth of an inch to the right of the middle line.

Now on a normal head of about the same dimensions as that of the patient on which I had drilled a hole in the palate and sphenoid similar in situation to the bullet and in a direction towards the mid-point as described on the vertex, and after thrusting a metal rod exactly up to this point just to the right of the middle line, I found on making a section of the skull from before back and just to the left of the falx that the rod passed through the left of the sella Turcica in front of the optic commissure through the corpus callosum and gyrus fornicatus and marginal convolution, corresponding to the inner surface of the ascending frontal convolution. This course would injure the region indicated by Schäfer and Horsley as that presiding over the functions of the muscles of the trunk. Of course if the track of the bullet was straight from the wound of the palate to its present position it would be a little behind the line indicated. But I think there are grounds for believing that it followed the latter line, struck against the vertex, and simply fell back into the great median fissure. They are these. — When the patient, who is a highly intelligent and observant man, was describing to me what had occurred and without the slightest suggestion from anyone he said that on firing the first shot he felt a distinct blow upon the vertex. He put his hand upon the middle of the vertex and said, "It regularly rattled there." Again, I venture to think it extremely unlikely that a ball which had traversed the bone of the palate and body of the sphenoid would be stopped by the soft matter of the brain. Thirdly, on examining the bullet there is at its base a portion of its cup flattened inwards towards the latter but still curved outwards, and this curve would about correspond to that of a segment of the under surface of the vertex. Supposing the conical bullet to have passed point forwards through the base of the skull it is hard to account for this facet unless it turned over and struck another curved surface of bone. And this could only have been the under surface of the vault. But though the position of the intracranial bullet appeared clear I felt strongly that it ought to be let alone. It was producing no cerebral disturbance which was increasing or likely to shorten life. On the contrary, observation during

the first week or two in hospital showed distinct improvement in the left hemiplegia and in the optic neuritis, while the headache and vomiting had gradually ceased. The patient had improved in general condition and had become bright and good humoured. It appeared to me therefore beyond all question that the rule which I had learned long ago during war-time—namely, that unless bullets in any part of the body are producing decided and dangerous symptoms they ought to be let alone—should be followed in this case. And it appeared as time went on that the bullets might in this case as in many others become encapsuled and give no trouble. I therefore absolutely put aside all thought of operative interference and watched the steady improvement, hoping that it would be permanent. This improvement went on until the patient was able to get up and about with only moderate paresis of the left arm and leg; otherwise he was in excellent health and spirits. The progress still continued until the thirty-eighth day after the appearance of the hemiplegia. But on the sixty-sixth day after the injury (Jan. 23rd, 1899) the patient while in bed at 10 P.M. had a fit lasting from three to five minutes. Both sides of the body appear to have been equally convulsed. At all events, no localising symptoms could be observed. Consciousness was lost at the same time. The fit was preceded by a feeling of chilliness, then by a rigor, and when the temperature was next taken it was 100.6° . The next morning it was only 100° , but in the evening it was again 100.6° . When seen in the middle of the fit by the house surgeon (Mr. P. G. S. Williams) the patient was lying on the right side breathing stertorously with his eyes just open and the pupils equal but much dilated. There was a little blood-stained saliva on the lower lip from a bite of the tongue on the left side. The muscles of the face were not seen to twitch but the arms and legs did so. The tongue, on return of consciousness, deviated to the right. The knee reflexes were excessive on the left and normal on the right. The muscles on the right side of the face appeared a little stronger than on the left. He moved all his limbs quite easily. Immediately before the onset of the fit the patient experienced great anxiety as of something dangerous about to happen. He stated that the fit "began in his head not in his limbs." He did not pass urine or fæces under him.

All the next day (the sixty-seventh after the injury) he was quite well except for the rise of temperature, but at 2 A.M. on the following day, Jan. 25th (the sixty-eighth), he had another fit of the same kind, and again at 3.15 A.M. a third, each preceded by a rigor and lasting about as long as the first. The left arm was observed in these to contract more than the right. On the next day (the sixty-ninth), Jan. 26th, there was a fourth fit. This, too, was preceded by a feeling of great anxiety but not so much shivering as before. It was felt to commence in the left arm and soon involved the left leg. The limbs on the right moved somewhat but not so much as on the left, and there was more rigidity on the right. The contractions lasted about one and a half minutes and were followed by some rigidity. The patient appeared to be unconscious during the earlier part of the fit but his mind rapidly regained its clearness and he did not bite his tongue this time. During the fit the head was directed to the left as were both eyes. The urine was still free from albumin and sugar.

It appeared to me now that a point had been reached at which an attempt ought to be made to extract the intracerebral bullet. The occurrence of fits, the rigors, and the rise of temperature seemed to indicate the beginning of inflammatory trouble round the bullet which lay upon the corpus callosum. And I feared that to delay might risk the formation of an abscess or meningitis in a very dangerous region. All preparations were therefore made for operation, especially careful measurement of the patient's skull with callipers, &c., and comparison of the results with those of the skiagram which, of course, was larger.

The operation was done on Jan. 26th, 1899, at 2 P.M. as follows. The head having been carefully shaved and prepared in the usual way was elevated considerably so as to give a good view of the vertex. I then marked out the superior longitudinal sinus by a line made with an aniline pencil from the glabella to the external occipital protuberance. The mid-point of this was then taken and a spot one-eighth of an inch to the right of it was marked as the position of the ball. One inch in front and one behind this two transverse lines A A and B B were marked at right angles to the first and each three inches long. At the distance of an inch from the middle line and parallel

to it each of these transverse lines was met from the front and back by two others each an inch long (*cc* and *dd*). The two quadrilateral flaps *cc* A and *dd* B were now formed by firm strokes of the knife cutting on to the bone in the lines given and were turned back. Then the incision *ee* was made down to the bone in the middle line. When the edges of this last wound had slightly retracted a cut with a Hey's saw was made in the same line from *e* to *e*, inclining outwards as it deepened so as to avoid the superior longitudinal sinus. When this had nearly reached the dura mater a second cut

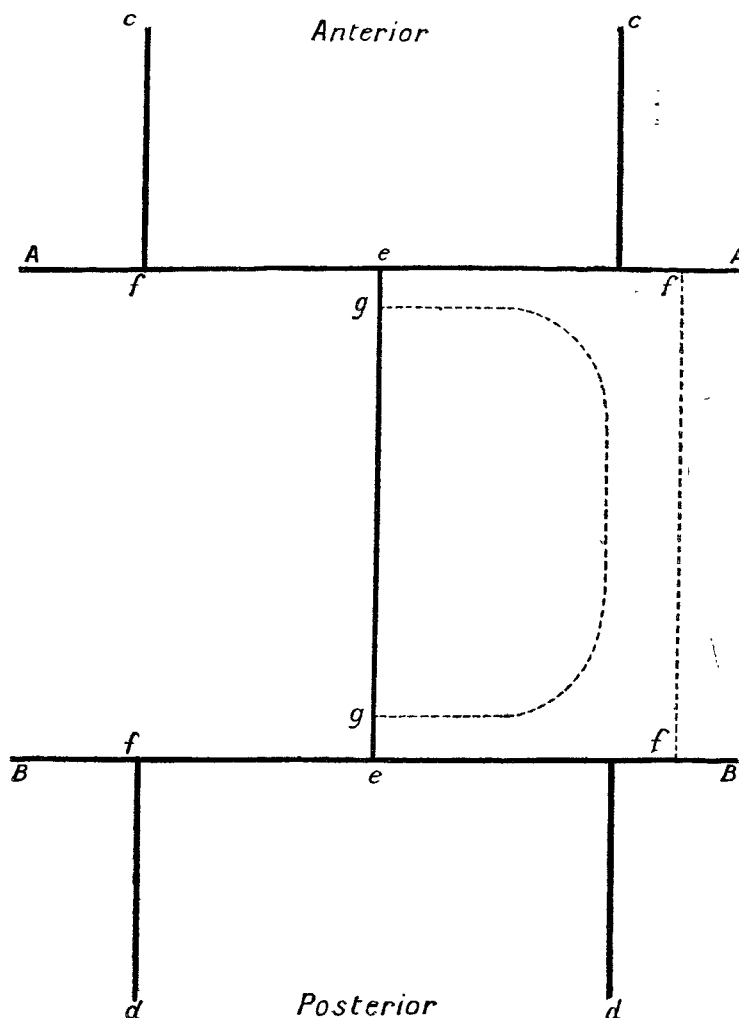


Diagram showing measuring lines and lines of incision.

a quarter of an inch from it and parallel to it was made, this time inclining towards the middle line. Between the two a narrow strip of bone triangular in cross section with the apex of the latter on the dura was removed. Then a cut was made through the skull from *e* to *f* at both ends of the quadrilateral A *ee* B each inclining well towards its fellow as it deepened. Finally, a Gigli's wire saw was passed from *f* to *f* under the bone between it and the dura and the remaining side of the quadrilateral A *ee* B was sawn through from within outwards without disturbing the skin. With an elevator inserted in the line *ee* I was now able to turn out the square piece of bone *feef*, the attached skin acting as a hinge at *ff*. This skin and bone flap was covered with a thick layer of sterilised gauze to protect it until laid down again. A curved incision, *gg*, was now made in the dura mater and the flap was turned over to the middle line without wounding the longitudinal sinus which lay along its base.

The first thing noticed was a certain amount of congestion of the pia mater and slight adhesion to it of the dura mater. But whether the latter condition was pathological and due to previous injury by the bullet it is not easy to say. It was quite evident, too, that great intracranial tension existed, the brain bulging strongly into the opening.

I now passed a probe down along the falx in the direction in which the bullet was supposed to lie and actually touched it once or twice, but failed to grasp it with a slender forceps, though I also touched it with the latter. At this time the intracranial tension was much increased by attempts at vomiting and the exposed convolutions cracked and a little grey and white matter escaped. After a considerable amount of unsuccessful probing, finding that I could not secure the

bullet otherwise, I passed the little finger of the right hand down along the falx and at once felt the bullet. I then substituted the left little finger for the right and touched the ball at once and thus guided caught it immediately with a slender forceps and withdrew it. Had I used my finger at once in the first instance I think I should have done less injury to the brain than with the probe; as it was, several flakes of the cortex were lost. But I feared to use the finger at first in the presence of the great bulging of the soft cortex.

There was very little bleeding and no inflammatory effusion was let out. The dura mater flap was now stitched for the anterior two-thirds of its border and the bone and skin flap was folded back into the space in the skull. As its outer surface was larger than its inner it could be pressed into its bed without danger of compressing the brain. A few points of silk suture united the various lines of incision and a sterilised gauze dressing firmly bandaged completed the operation.

The patient's condition throughout the operation was excellent and except for some chloroform vomiting for the first 12 hours or so there is nothing to note until the wound was dressed on the tenth day and found healed per primam.

Certain nervous phenomena, however, have to be recorded and may be summarised briefly as follows.

Consciousness returned rapidly and was perfect the same evening, but sensation and motion were absent at first all over the left side except in the face. This lasted all the next day. On the third day after the operation sensation had returned, but the patient could not localise a pin-prick accurately. He pointed with the opposite hand too high on the arm and too low on the leg and foot, as Dr. Risien Russell pointed out when he was kind enough to examine him. On the day after operation there were slight power of flexion and extension of the fingers of the left hand, especially of the thumb and index finger, and a little power of extending the wrist. The leg remained without movement this day also. Sensation on the body and limbs on the left side continued defective. Tactile sensation on the ulnar half of the back of the hand while it lay on the chest was usually referred to the latter. That of the radial half of the back of the hand and wrist was fairly normal. On the left half of the trunk touch and pin-pricks were referred to the right half of the body. Sensation about the left knee was either not felt or was referred to the right half of the body. The same applies to the left heel. Sensation to heat and cold on the left side of the body was also affected. He almost invariably felt heat as cold and cold as heat on that side, while on the right he was usually correct on these points and he seemed to be much less sensitive to a hot tube than to a cold on the left side of the body. There appeared to be complete loss of muscular sense on the left side. During the second day after operation the patient vomited four or five times. There were no fits. On the third day the general condition was excellent. The patient could just begin to move the left leg and sensation was less disturbed all over the left side. The tongue deviated perhaps a little to the right side. The left pupil was still distinctly larger than the right. On the fifth day after the operation further progress is recorded as follows. There was neither vomiting nor rise of temperature. The appetite was good and there were no fits. The patient was very cheerful. Knee reflex was present on the left, perhaps it was absent on the right. Tactile sensation was nearly if not quite normal, but muscular sense was still absent on the left.

On Feb. 1st, the seventh day after the operation, there was still further improvement, though tactile sensation was still higher on the arm and lower on the leg on the left. On the ninth day tactile sensation was better though still inaccurate. The resident medical officer (Dr. Batty Shaw) while examining the patient noticed that the trunk muscles were acting very weakly on the left side. The right side of the chest acted more powerfully than the left with forced respiration and the right rectus abdominis as well as the umbilicus deviated to the right. No note on this point unfortunately was made during the state of hemiplegia previously to the operation. The condition of trunk muscle paresis was pointed out by Dr. Risien Russell to be only marked during voluntary action of the muscles, while during involuntary use the left side appeared to act most deeply. At this time all his movements tended to turn the patient over on to his left side whenever he was placed on his back and consequently he sooner or later lay on his left side whatever position he might be placed in. On the tenth day the wound was dressed for the first time; primary union was perfect

except at the posterior angles of the longitudinal incisions which had been left unstitched to allow of oozing. The knee reflexes were normal on the right but exaggerated on the left and on this side ankle clonus was well marked. The marked curving of the body to the right owing to paresis of the trunk muscles was particularly noticed on this day and photographs were taken of the condition and of the deviation of the umbilicus to the right. The muscles on the left were also noted to be flabby as contrasted with those of the right. For the first ten days after operation the temperature had been nearly normal. It had risen to 100.2° on the night after and had then ranged from 98.6° to 99.6° for a few days. All this time the patient was very cheerful and took his food with relish.

On Feb. 8th (the fourteenth day after operation) some pain was felt on the inner aspect of the left knee and also in the shoulder and elbow. On Feb. 13th (the nineteenth day after the operation), at 6 A.M., the patient stated that the left arm was affected with slight clonic contractions at the elbow lasting for about half a minute; this he ascribed to having been lying on the arm. He also stated that during the last week he had had occasional slight twitchings in the left calf lasting for a few seconds. The pain in the left knee and arm continued to be felt but only on movement of the parts. That in the arm followed the course of the ulnar nerve below the elbow. The optic neuritis was much better, the hæmorrhages had practically gone, and striation was much less marked, the left eye being practically normal. On Feb. 14th (the twentieth day after the operation) supination of the forearm was noticed for the first time and later flexion of the same. On Feb. 20th (the twenty-sixth day after the operation) tactile sensation was almost normal, but localisation of touch was still incorrect. The patient could now raise himself into a sitting posture without using his arms, but there was still little or no movement of the left shoulder or extension of the elbow. There was no movement of the left toes. The pains in the arm and the knee had ceased, but the latter was still rather stiff. On Feb. 22nd (the twenty-eighth day after the operation) there was for the first time some extension of the left elbow. The patient had put on much flesh since the operation and looked extremely well. On Feb. 24th (the thirtieth day after the operation) there was further improvement in extension of the left elbow and the left deltoid had begun to act. The left knee was less stiff and painful. Knee reflexes and clonus were as before. On taking a deep breath the abdomen and the chest on the left still bulged more than on the right. The patient stated that when he yawned he had a feeling as if his left arm was being raised up. This was a perfectly voluntary statement without any suggestion.

Some notes made by Professor Schäfer on Feb. 8th may now be of interest. Tested with compasses.

1. Points three centimetres apart are felt double on the dorsum of both feet both transversely and longitudinally.
2. Points three millimetres apart are felt double on the dorsum of the left foot, but are never felt double on the right foot.
3. When the dorsum of the left foot is touched he feels the instrument on the left shin.
4. Localisation on the sole of the left foot is correct.
5. Touch on the left toe is referred to the left heel.
6. Touch on the inner side of the left great toe is referred to the outer side.
7. Localisation on the inner side of the left knee is correct.
8. Sensation on the outer side of the left knee is referred to the outer side of the left calf.
9. Sensation on the left ankle is referred to near the left heel.
10. Localisation on the left heel is correct.
11. Points three centimetres apart transversely, only one point is felt over the vastus internus on the left side about two inches above the knee. Points longitudinally, two points are felt. On the right side at the same place both points are felt in any position.
12. On the inner side of the upper third of the left thigh touches are correctly localised. On the outer side they are localised a little too high the first time but correctly the second.
13. On the hypogastrum with the points six centimetres apart only one point is felt on both sides. He frequently says that there are two points when there is but one applied. This is on both sides of the body.
14. Both points are distinguished at 20 millimetres apart on the dorsum of both hands.
15. Only one point is felt at eight millimetres apart on the palmar aspect of both hands.
16. On the palmar aspect of the middle finger both points are felt at eight millimetres apart.
17. Both points are felt at four millimetres apart on the palmar surface of the fingers of both hands.
18. Both points are felt at three millimetres apart on the middle phalanx on the left side and only one is felt on the right side.
19. Both points are felt at two millimetres apart on the terminal phalanx of both hands.

The further course of the case was one of steady improvement. The patient was soon able to walk and when shown to the Clinical Society of London in May he could

walk well, though still with considerable weakness on the left side. After that and until he went abroad he improved still further; but at the Clinical Society of London I expressed the belief that the case was still by no means complete and the prognosis must be regarded as doubtful. I felt that the possibility of further epilepsy could not be overlooked. And during the last few days I have had letters from him saying that such attacks have appeared and have required further treatment, the nature of which he promises (in a letter received on Nov. 3rd, 1899) shall be communicated to me. He states that since the operation he feels perfectly well and hopes to visit me soon in London.

PS.—Since the above was written I have received a short letter from Dr. Chipault of Paris, of which the subjoined is a translation: "I have operated on — with a perfect result. I trephined and separated some adhesions between the two hemispheres. Result: For nine days before the operation there were from 60 to 100 epileptic crises in the day with complete hemiplegia. All this has disappeared except a spasmodic reaction of the lower extremity." In a later letter (Nov. 16th, 1899) the patient states that he still remains quite well. He thinks that he has more power in the left leg and arm than before. He promises further reports from time to time.

Harley-street, W.

A CASE OF CONGENITAL HYPERTROPHY OF THE PYLORUS IN AN INFANT;

RECOVERY; SUBSEQUENT DEATH FROM BRONCHOPNEUMONIA.

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THE condition known under the above title is not of frequent occurrence and nearly all reported cases have terminated fatally. Finkelstein has however recorded three cases of recovery in infants under nine weeks of age and Senator in a discussion on this subject mentioned one other such case. Recovery in such cases readily leads to some doubt as to the correct diagnosis having been made, but in the following case in which the diagnosis was made and in which recovery took place, death subsequently occurred from an acute attack of bronchopneumonia and gastro-enteritis, and at the necropsy a condition was found which would lead to the conclusion that the original diagnosis was correct.

A male infant, aged 11 weeks, was brought by his mother to the out-patient department of the Hospital for Sick Children, Great Ormond-street, in November, 1898, with the history that when he was five weeks old he had begun to vomit and about the same time the bowels became very costive and the child had wasted. The vomiting had continued in spite of treatment. The child had been fed by the breast till nine weeks old after which time he was given Nestlé's milk. The child was a fine baby at birth. On examination nothing abnormal could be felt in the abdomen, but the peristaltic movements of the stomach were very distinct. The temperature in the rectum was 96° 2' F.

On Dec. 2nd the child was admitted to the hospital under my care and the following note was taken. The child had been quite well until five weeks old when he began to throw up his food and he had continued to vomit since. Food came up about from five to ten minutes after feeding. The bowels had been regular during the first five weeks of life, but since that time they had been very constipated, sometimes being confined for a week, and they had hardly acted once spontaneously. The child had had no other illness; he had been fed by the breast till he was nine weeks old, and was then tried on cow's milk, but as this did not agree with him he was given Nestlé's milk. He was the youngest of five children, all the others being healthy. The mother had had no miscarriages and both the father and the mother of the child were healthy.

On admission the child was very thin and weighed seven and a quarter pounds; he did not look very ill and the muscles of the limbs were fairly firm. The anterior

fontanelle was depressed. Nothing abnormal could be detected in the heart or lungs. The abdomen was flaccid and easily palpated and this seemed to cause the child no pain even when deep pressure was made. On inspection of the abdomen the peristaltic movements of the stomach could be distinctly seen passing from left to right; these movements followed one another in quick succession. On deep palpation in the right hypochondrium about a finger's breadth outside the nipple line a firm transverse mass, in shape like the pylorus, could be felt; it was not always palpable when no peristalsis was taking place. The mass was less distinct than in another case of the same nature that was under my care and which ended fatally; reference is again made to this case in the table. During the first 24 hours that the child was in the hospital he was fed on equal parts of cow's milk and barley-water, and during this time he vomited four times. The temperature in the rectum was 97° 2'.

Owing to the condition of the child he was on the following day given three ounces of cow's milk and barley-water, two parts of the former to one part of the latter, by a nasal tube every two and a half hours. During the next few days, although the vomiting did not entirely cease, the child improved and passed a digested motion. The nasal feeding was continued and as the motions were digested ones no alteration was made in the character of the milk. The child improved in appearance and the vomiting became less; on some days vomiting occurred once or twice and on other days there was no vomiting. The temperature continued for the most part subnormal. On Dec. 9th a teaspoonful of cream was added to the nasal feedings and on the 17th some cod-liver oil was also given and on this date the child weighed seven and three-quarter pounds—a gain of eight ounces since admission. On the 21st, the child not having vomited at all for two days, an endeavour was made to return to feeding by teat. The child, however, took nearly half an hour to swallow three ounces and vomited four times in the 24 hours. Nasal feeding was again resorted to and the vomiting again became less. The pylorus was now less distinctly felt than on admission and at times it could not be felt at all. Nasal feeding was again abandoned on the 30th and although the child vomited occasionally the feeding by teat was persisted in and after Jan. 6th, 1899, the vomiting almost ceased.

About this time Mr. T. H. Kellock kindly saw the child with me with a view to the possibility of relieving the condition by operation, but owing to the feeble and wasted condition of the child it was considered unadvisable that anything should be done. On Jan. 7th the motions contained some mucus and undigested milk; a dose of grey powder was given and the motions again became natural.

The weight of the child remained stationary and as there were no urgent symptoms the mother was on Jan. 12th again given charge of the child and he was brought as an out-patient. When discharged the vomiting had entirely ceased, the motions were natural, the temperature was normal, and the pylorus could no longer be felt; the child only weighed seven and three-quarter pounds. The mother was instructed to continue the same diet. The child now began to improve and on Feb. 10th he weighed eight and a half pounds. During the next few months steady improvement took place and except for slight attacks of vomiting and occasional undigested stools with mucus the child progressed well. Small doses of cod-liver oil in various forms were tried on several occasions, but with the result that they always gave rise to vomiting and after a few trials the attempt was abandoned.

On March 18th the child weighed 11½ pounds and on May 13th 16 pounds. The child was again seen in June and in July. He had then taken no drug for a period of three months and was plump and healthy; he was therefore discharged with the request that he should again be brought to the hospital in three months.

In August, however, the mother again brought the child to the hospital with the history that three days previously he had been taken suddenly ill with diarrhoea and vomiting. The child looked ill and the eyes were sunken and nothing abnormal could be felt in the abdomen. The child was again admitted to the hospital. During the first 24 hours he vomited three times; the motions were frequent and loose, and the temperature rose to 104°. During the following days the temperature remained between 102° and 105° and the diarrhoea and vomiting continued. There were a few crepitations at the bases of the lungs. The child now, however, in spite of treatment, became more collapsed and