classifies it as an acute case. It was allowed to reach an extreme state with convulsive seizures occurring every fifteen minutes. Forty-five hundred units of tetanus antitoxin were slowly injected intraspinally according to the usual technic. Forty-five hundred units were given intravenously, which is somewhat below the amount usually deemed necessary. No antitoxin was given by the subcutaneous or intramuscular routes except the 3,000 units given before the patient was brought to the hospital.

The local treatment consisted in exposing the wound to a continuous stream of oxygen for thirty-six hours. Boric acid and alcohol dressings were used to counteract the local infection. Free use was made of cathartics. During the first two days in the hospital sedatives in form of morphin and chloroform were at intervals used. It would appear that in the intraspinal administration of tetanus antitoxin we have an agent that has robbed lockjaw of its despairing terrors.

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HYDROCEPHALUS

THE POSSIBLE RELATION OF A CONTRACTED PELVIS TO HYDROCEPHALUS DEVELOPING AFTER BIRTH

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While it is recognized that an obstruction of the foramen of Magendie or the aqueduct of Sylvius will cause hydrocephalus, yet, in searching the literature at my command I have failed to find an instance in which reference is made to delivery through a contracted pelvis as a possible cause of these lesions. For the present I wish to eliminate the developed congenital type of hydrocephalus and consider only those cases which appear normal at birth, but soon thereafter show abnormal cephalic development.

The pathologic findings of an advanced hydrocephalic, that is, the overdistended ventricles and their sequelae, require no reference in this connection, but the primary factors, that is, the occlusion of the foramen of Magendie or the aqueduct of Sylvius, do furnish special interest. The method of their occlusion, whether it be of an infectious or a mechanical nature, should be accepted as the primary factor for consideration.

I find but one instance¹ in which hydrocephalus was produced in the laboratory by mechanical obstruction, but the results from these tests were sufficient to demonstrate that a blocking of the ducts hindered a normal communication between the ventricles; that practically no absorption occurred in the ventricles, but on the contrary, a secretion of fluid which in time filled the isolated chambers to overdistention.

Accepting the foregoing, the possibility of a contracted pelvis causing abnormal compression of the child's head sufficient to occlude, if not obliterate the duct, would not be out of reason. The idea may seem far fetched, however, when the anatomic relations of the structures are considered. Not infrequently a child appears normal after a difficult labor, but soon thereafter portrays symptoms of hydrocephalus.

Lues and tuberculosis are usually considered as the causative factors when the condition occurs, but we

are beginning to learn that these diseases are not responsible to the extent that was formerly believed. In fact, repeated complement-fixation tests² speak against the assumption of syphilis as a common etiologic factor.

An instance in which two successive children developed post-partum hydrocephalus, when both parents were free from stigmata of disease, but pelvic mensuration of the mother revealed a contracted pelvis, is of interest in this connection. A third child, delivered through a cesarean section, showing no abnormal symptoms several months later, lends additional interest, and is sufficient to serve as a forcible argument for the possibility of a contracted pelvis being the prime causative factor in many cases of post-partum hydrocephalus.

History.—Mrs. D., aged 29, well nourished; past history negative. Same is true of husband. Patient the mother of four children, two living and two dead. The first child was an undersized babe at birth, now eight years ago. Although the labor was very difficult, still it terminated normally. The child is to-day healthy in all respects.

The second child, born three years later, reached full term. The patient says that it was a very difficult and prolonged labor, terminated by instrumental means. The child appeared normal at birth, but shortly thereafter began to develop hydrocephalus. It lived three years. It was my privilege to see this little patient shortly before he died. I regret not having secured a photograph, as the case showed such a pronounced state of development. No complement-fixation test was made.

The third child was delivered under most difficult circumstances. He lived but a short time; at birth there were no symptoms of cephalic enlargement, but it was well marked at death.

A fourth pregnancy reached full term. In the meantime a pelvic mensuration had revealed a contracted pelvis. The patient had been in labor twelve hours when I was called. I found the os well dilated, and fortunately the sac was still intact. No engagement had taken place. She was removed to the hospital where I performed a cesarean section and delivered a normal child. The steps of the operation need not be mentioned here. The mother made an uneventful recovery. The child is to-day, four months later, apparently healthy and shows no signs of any abnormal cephalic development.

It would be rather presumptive on my part to infer that this child would have developed hydrocephalus, as did the two previous children, as there is of course no proof to substantiate this assumption, but the coincidence of the contracted pelvis and the fact that the last child is healthy and normal is sufficient to point toward the possibility of the previous labors being the prime causative factor in the two former cases. Be that as it may, the case is undoubtedly of sufficient worth to serve as a guide for other similar cases, if not of argumentative worth.

All the ingenious methods of von Bramann³ and others to establish a communication between the two ventricles, are far from satisfactory. Here as elsewhere, if prevention is possible, it is far better than cure. The operation of cesarean section, when performed by a surgeon ready to cope with conditions as they arise, is not a formidable one, and is truly justifiable in later pregnancies when there is a contracted pelvis, and hydrocephalus has developed after a previous difficult labor. In case the hydrocephalus has developed in utero, the operation ought to be the

1. Dandy, W. E., and Blackfan, K. D.: An Experimental and Clinical Study of Internal Hydrocephalus, *THE JOURNAL A. M. A.*, Dec. 20, 1913, p. 2216.

2. Knoepfelmacher, W.: Hydrocephalus, chronicus internus, congenitus und Lues, *Med. Klin.*, Dec. 6, 1909, No. 49.

3. Von Bramann: Puncture of the Corpus Callosum for Hydrocephalus, *Deutsch. med. Wchnschr.*, Sept. 23, 1909.

procedure of choice as the barbaric operation of craniotomy is truly a more hazardous one, so far as the mother is concerned, than is cesarean section. As to the method employed, whether it be the classical section or the extraperitoneal, is of course optional with the surgeon. Both methods have their advantages.

REPORT OF FOUR CASES OF FOREIGN BODY IN THE AIR PASSAGES OR ESOPHAGUS*

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CASE 1.—*Jackstone in the Larynx.*—F. B., boy, aged 19 months, got a "jack" in his throat a month before admission to the Children's Memorial Hospital. He was playing on the floor when his mother picked him up to change his diaper. As she picked him up he grasped a couple of jackstones with which the other children were playing, and as his mother laid him on his back he dropped them. One of them went into his mouth. The mother took him at once to a hospital where some physician, probably an intern, assured her that there was nothing in the child's throat. He passed a stomach tube and told the mother that if the jack were in the throat the stomach tube would shove it on into the stomach.

The child's difficulty in breathing and swallowing continued so that she returned with the child to the hospital the next day. This time she says she was told that the child in all probability had a "cramp." She next took the child to the family physician, who treated the child for bronchitis.

After a month he was brought to the Children's Memorial Hospital, where a roentgenogram was taken and the jack located. During the four weeks that the foreign body had remained in the child's throat he could eat very little.

On admission to the Children's Memorial Hospital his condition was fair. Breathing was difficult. The eyes, ears and nose were negative. In the neck there were palpable glands and distinct tenderness around the trachea. Examination of the chest showed difficulty in breathing, particularly on inspiration. The lungs and abdomen were negative. The roentgenogram showed the jack lying opposite the fourth, fifth and sixth cervical vertebrae (Fig. 1).

The patient was anesthetized with ether, and Bruening's speculum for direct laryngoscopy in children was introduced. On account of swelling at the entrance to the larynx, there was considerable difficulty in seeing the foreign body, although it could be easily felt with the speculum. Several attempts at grasping it proved unavailing; the speculum was removed and the foreign body grasped with a long pair of hemostats guided by the sense of touch. It was firmly imbedded and required some little manipulation and force to dislodge it. Only slight bleeding followed. The jack was so lodged that one of the ball-shaped ends was directed downward and lay within the lumen of the larynx. Another arm was directed backward, and lay between the arytenoid cartilages. The third arm lay crosswise within the lumen of the larynx, but above the vocal cords. The swelling of the aryepiglottic folds caught this arm, which was directed crosswise, and made the removal difficult.

Fig. 1.—Jackstone in the larynx (Case 1).

The patient did well following the operation. He had a little fever for about three days. At one time he had so much difficulty in breathing that intubation was considered, but this cleared up without the necessity of intubating, and the patient was allowed to go home. He was somewhat hoarse when he cried, but otherwise he seemed well. Two days later he was brought back to the hospital with great difficulty on inspiration. I attempted to intubate but without success. The patient's condition in spite of inhalations of oxygen being very bad, I did a hurried tracheotomy without anesthesia. The day following the tracheotomy, the temperature reached 103, but declined soon afterward to 100. The next day it was normal. The tracheotomy tube had been in place one week and I was just ready to remove it when I was taken sick with scarlet fever and did not see the patient for six weeks. Meanwhile the tracheotomy tube had not been removed. When I removed the tracheotomy tube after it had been seven weeks in the trachea, the tracheal wound closed at once and no air could enter. The trachea was deformed by the long presence of the tube so no air could enter by the natural way. It was necessary to reinsert the tube at once to prevent death from asphyxia. Again I attempted intubation, but for some reason could not enter the larynx. It was necessary to enlarge the tracheotomy wound, but this could not be done with the tracheotomy tube

in place on account of the flange on the tube. Accordingly the end was cut off a linen catheter the size of the tracheotomy tube, and this piece of catheter inserted instead of the tracheotomy tube. The tracheotomy wound was then enlarged and a very small linen catheter passed upward through this wound through the larynx until it could be drawn out of the mouth. The intubation tube was then threaded on this small catheter as a guide and shoved down until it reached the tracheotomy wound, when both catheters were removed and the tube pushed down past the wound. The wound was then allowed to heal, and in a week's time it was completely healed. The intubation tube was then removed, and the patient having no further difficulty, was discharged cured.

Among the interesting features of this case are:

1. The length of time a foreign body of this size remained in the larynx without causing alarming symptoms.
2. The ease of diagnosis by means of the Roentgen ray.
3. The difficulty of intubation.
4. The difficulty of establishing normal respiration after removal of the tracheotomy tube.

CASE 2.—*Bronchoscopy with Removal of Tack from the Right Bronchus.*—C. A., boy, aged 9, deaf-mute, was said to have swallowed a nail about 7 o'clock in the evening. Immediately afterward he had a coughing spell which lasted for a half hour. At 10:30 p. m. he was brought to the Children's Memorial Hospital and roentgenograms taken showing both frontal (Fig. 2) and lateral views of the chest. The pictures showed a foreign body resembling a nail 1 inch long with a rather large head lying behind the sixth rib, 1 inch in front of the vertebral column, and $\frac{1}{4}$ inch to the right of the margin of the sternum. The shadow showed the point uppermost.

I saw the boy about 1 a. m. of the following morning and had him prepared for immediate operation. He was resting quietly at the time. He was anesthetized with ether and a low tracheotomy done, after which a suitably sized bron-

* Presented by invitation before the Chicago Pediatric Society, Nov. 13, 1914.