

a board, long pins were passed laterally through the pelvis and secured to the board by means of hooks, and the whole pelvis then imbedded in plaster-of-Paris.

The board to which the body was secured was then placed on a stand with four upright rods attached at the four corners, to which rods a flat board was attached so that it would slide smoothly up and down. The child's trunk therefore was placed between two boards, one being fixed and the other pressing down upon the child's head. To keep the head in place it was inserted in a tightly-fitting tin cylinder which was fastened to the under surface of the board. Weight placed upon the upper board, (sliding as it did freely upon the uprights) brought a downward pressure upon the child's head and shoulders. To make the latter more even a wooden collar was placed around the neck resting on the shoulders. Long pins were then inserted in the spinous processes of the vertebræ so that rotation could be more readily noticed. To check the falling forward of the neck a cord was placed around the neck and fastened at the side to the uprights, acting as a check, just as in life the longer muscles of the back would act in keeping the body erect.

Downward pressure upon the upper board caused the child's back to bend backward (convexity backward). When carried beyond a certain point the column would bend sideways with marked rotation, with the changes usually noticed in the ribs, flattening on the side of the concavity and projection on the side of the convexity. This projection was most marked in the middle and upper dorsal region, but the amount of greatest rotation appeared to be in the lower dorsal region. If the angle of downward pressure was changed, or if the pelvis was tipped so as to cause a curve in the spinal column the effect of downward pressure was more marked.

Rotation of the vertebræ was, of course, readily produced by lateral pressure twisting the spine; and on removing all downward pressure, by placing the cadaver in a horizontal position rotation and curvature in the dorsal region was easily made by twisting the pelvis and holding the head fixed, or *vice versa*, the axis of the head and pelvis being kept the same.

Although a well marked scoliosis was thus artificially produced, attended by the characteristic flattening of the ribs on the side of the concavity and projection on that of the convexity, yet a more careful examination appeared to show that although this was the result of downward pressure, it was downward pressure not exerted in a perfectly vertical direction; for although the force was applied properly, yet it was not possible to prevent some play in the cervical region, from which it resulted that the force fell obliquely upon the under portion of the spinal column, causing curvature and necessarily rotation.

If it were practicable to apply a force directly downward and transmit it through the cervical and upper dorsal region without deviation, the effect upon the lower dorsal region would be to cause an antero-posterior curvature.

The lateral curvature therefore results from downward pressure, but downward pressure applied obliquely upon some portion of the spinal column. Rotation follows from the anatomical structure of the interlocked vertebræ, it being possible for them to rotate slightly, while the amount of tipping sideways (without twisting) which the articular facets permit is much less.

Rotation takes place with the vertebral bodies directed toward the convexity and the spine to the concavity for the reason that the former being larger, are unable to be crowded into the smaller space of the concavity, and are pushed in the direction where there is more space. Perhaps also, as has been pointed out by Judson, the fact that the bodies are free while the spines are held by muscles may give the former more freedom in movement.

From the above facts the following generalizations may be made:—

The effect of the weight of the thorax on head and shoulders would be, if applied in a vertical direction, to bend the spinal column forward and backwards, but in flexible spines the superincumbent weight rarely falls directly, and curvature follows. This is at first a physiological process, but it subsequently becomes, by the alteration in the shapes of the bones under altered pressure, a pathological change.

The extent of the curve, and the situation of the curve will be determined by the attitude habitually taken by the individual, and perhaps also by a difference in the resisting power in different parts of the column.

The injurious effect of superincumbent weight in curving the spine, is increased by the obliquity of the pelvis, or the inclination of the shoulders so frequently taken by persons of weak muscular systems in sitting sideways and leaning. The curve is usually in the dorsal region, with the right shoulder raised, as the majority of people are right-handed.

The distortion is one of growing years, and is more common to girls than boys, for two reasons, namely, that at the age when lateral curvature is usually seen first, girls grow more rapidly than boys, and their muscular system is less well developed, from the customary of life habits of girls in society. The effect of superincumbent weight upon a yielding spine in adult life, after the vertebræ have ceased to grow, is to cause an increase in the antero-posterior curve of the back.

The matter may be summed as follows:

The deformity known as lateral curvature is the result of several factors, the chief being,

1. Superincumbent weight.
2. Faulty attitudes due usually to muscular weakness.
3. A condition of the bone structure of the spine incapable of resisting the effect of weight, analogous to that known as rickets of adolescence.

SIX CASES OCCURRING IN PRACTICE.

- I. SPASMODIC ABDOMINAL CONTRACTIONS. II. PARALYSIS OF ARMS IN CONGENITAL SYPHILIS. III. TWO CASES OF EMPYEMA, (1) AT EIGHTEEN MONTHS, (2) AT FOUR YEARS. IV. DOUBLE PLEURITIC EFFUSION AT THIRTEEN YEARS. V. SIMULATED VESICAL AND RENAL CALCULUS AT TEN YEARS.¹

BY T. M. ROTCH, M.D.

SPASMODIC CONTRACTION OF ABDOMINAL MUSCLES.

J. M., a man twenty-eight years of age, presented himself for treatment at the City Hospital, January 12th, 1886. He has always been strong and well, but since beginning to work as a barber last spring, has

¹ Read before the Boston Society for Medical Observation, February 1, 1886.

been very nervous. In April, 1885, he began to have attacks of spasm of the abdominal muscles. The contractions are irregular in force and interval of rest, but have been continuous and have incapacitated him from work; at first he had some control over the attacks, now he has none. The spasms occur nearly every day, and he feels that they are coming on a short time before they begin. The intervals are usually about half a minute. When he has succeeded in controlling one or two spasms the next one is increased greatly in severity.

He is slightly constipated, and since the attacks began has lost in strength somewhat and had a poor appetite. On physical examination nothing abnormal was discovered. He behaves, when observed during an attack, as though some one had struck him in the epigastrium.

He was treated with Fowler's solution, and on January 21st, reported himself as improving.

APPARENT PARALYSIS OF BOTH ARMS IN A BABY WITH CONGENITAL SYPHILIS.

C. S., a boy six weeks old, was brought to the Children's Hospital, April 7th, 1885, by his mother, a Swede. The mother has always been well and strong, according to her own account, and has never had any miscarriages, efflorescence on skin, sore throat or anything which would point towards her having been infected by syphilis, and, on examining her, nothing abnormal could be found: she is strong and healthy-looking and manifests a desire, for the sake of her baby, to answer all questions freely. She has had no other children, and states that the father of the child had a sore in April, 1884. The child is breast fed and was healthy at birth. When one week old the mother says that the child had a bulbous eruption coming out on the soles of the feet, legs, palms of hands, arms, body and face, and began to have snuffles. April 4th, the left arm was noticed to be paralyzed. On examination the face was found to be covered with reddened patches, ulcerations and crusts. The arm hung helpless by the side, and the child seemed to be sensitive to the touch and to have pain.

The oleate of mercury 20 per cent. was ordered spread on a flannel abdominal band. When seen on the 14th, the right arm was also helpless, and the mother stated that theunction had not been used much, as it caused excoriation. The ointment was then reduced in strength one half and hydrargyrum cum creta, one grain, given three times daily. In three days the paralysis of the arms disappeared, though the other symptoms continued. April 21st, the eruption had disappeared almost entirely from the face, but as the snuffles continued the mercury was increased to four grains daily; this had to be reduced to three grains later as it caused a slight diarrhoea. May 12th, the snuffles disappeared; the child was then not seen again until November 15th, when it presented gummata of the anus, a few papules on the body and a slight squamous efflorescence on the soles and palms.

The previously mentioned mercurial treatment was then renewed, and by December 10th, all the lesions had disappeared excepting the squamous eruption on the hands and feet. The child at present looks well and strong, and is cutting its incisor teeth.

This case is of interest, first on account of the apparent freedom of the mother from syphilis, while the child was undoubtedly syphilitic: second, as showing

that hereditary syphilis is not necessarily an atrophic disease, where the child can have good breast milk; (this child always looked particularly well nourished:) and finally the apparent cause of the paralysis. The possibility of the paralysis being poliomyelitis anterior acuta was considered but hardly seemed to cover the case, both arms being affected and entire relief taking place in three days after the use of mercury was properly carried out (of course it might have been essential paralysis but it is not probable.) A central syphilitic lesion was then thought of, but the rapid recovery of the paralysis before the efflorescence, or snuffles had begun to be affected seemed to show that a central lesion did not exist: the evident pain manifested by the child when the arms were touched and the speedy disappearance of this sensitiveness together with the paralysis under mercurial treatment, pointed towards a local trouble in the arms themselves, which causing pain on motion, the child did not choose to lift or use its arms. No traumatic history could be obtained; rheumatism occurring at six weeks of age and affecting the child in this peculiar way would be very unlikely, and I therefore supposed the case to be local inertia of the arms, from pain in the bones, resulting from that disease of the bones which occurs in hereditary syphilis and described by Wegner in Virchow's Archives, 1870, vol. 50. This disease was formerly called Parrot's disease, and supposed to be incurable until it was discovered to be one of the manifestations of syphilis. Roques describes a similar case, where the mother was apparently healthy but the child at birth had a pemphigoid eruption which disappeared under antisyphilitic treatment in a few weeks. At two months however paralysis of the arms occurred with pain and crepitation at the upper end of the humerus; antisyphilitic treatment was renewed and the symptoms passed off. Millard also reports a case where one arm was affected.

I thought that it might be of interest to the society to compare these plates showing the disturbance in the bones in Hereditary Syphilis, in Hereditary Cretinism, and in Rachitis.

In the foetal skeleton the long bones are cartilaginous and the process of ossification is intracartilaginous. As the cartilage changes to bone the cartilage cells increase in number and are closely packed together: then comes the area of osteoblasts, then the calcareous matter, and deeper down in the ossified portion are the blood-vessels running in from the periosteum.

The epiphysis of the bones of the arm are still cartilaginous at birth and they remain separated from the bone shaft for some time by a narrow cartilaginous layer. It is in this cartilaginous separating layer that certain changes are seen in congenital hereditary syphilis, as will presently be shown in the wood-cut, and Wegner's colored plates of fresh specimens show also the characteristic change of appearance of this layer from its normal color to a yellowish-white: the pain and sensitiveness in these cases of local syphilitic paralysis are probably caused by a consecutive low grade of periostitis; this same cartilaginous layer is also a marked feature in the changes which take place in the bones of congenital cretins and in rachitis. I will also call the attention of the society to these preparations of sections of bones, made by Dr. Wm. F. Whitney, which beautifully illustrate the difference of proportion between the cartilage and bone in the normal child at birth and the cretin, the cretin bone being

shorter and the cartilaginous epiphysis greatly out of proportion to the shaft; the cretin bone also showing the above spoken of cartilaginous layer or zone very narrow in comparison with the same layer in the rachitic bone.

Dr. Ernest Zeigler in his *Lehrbuch der Allgemeiner und Specieller Pathologische Anatomie und Pathogenese*: II. Theil, 2 Hälfte, represents these different conditions of the bones in four wood-cuts. No. I, illustrates diagrammatically the normal endochondrial ossification. No. II, the endochondrial ossification in a new born cretin. No. III, the endochondrial ossification in hereditary syphilis of the new born, with its misplaced foci of calcification, misplaced medullary spaces and islands of calcification. No. IV, the rachitic endochondrial bone formation. The literature of this osteochondritis syphilitica is: Wegner, *Virch. Arch.* 50. Bd. Waldeyer u. Köbner, *ib.* 55. Bd. Hoab, *ib.* 65. Bd. Veraguth, *ib.* 84. Bd. Stilling, *ib.* 88. Bd. Parrot, *Archiv. de phys.* IV. 1872; Cornil et Ranvier *Man. d'histol. pathol.* II. 1881. Kassowitz, *Die Normale Ossificat. u. s. w.* Wien 1881. Müller, *Virch. Archiv.* 92. Bd.

(Dr. Rotch then showed in addition to the colored plates of Wegner and the wood-cuts of Zeigler, colored plates of normal and rachitic bones by Kassowitz, and a photograph of the new born cretin from which Dr. Whitney had prepared the section of bone.)

III. EMPYEMA.

In reporting these cases of empyema, my idea is not to draw any especial conclusions from them or to give the records in detail, but to pick out some of the points which may be of use to others in the daily treatment of this class of cases, where the sudden changes from comparative quiescence of symptoms, with almost normal temperature, to heightened temperature and a serious aspect of affairs, is not of uncommon occurrence.

I have personally had only eight operative cases of empyema under my care, and with the exception of the two cases which I am about to report, and one other, simple incision, drainage and daily washing out with carbolic acid and water were employed, and where no complicating disease existed, they did well and ultimately recovered; but I should say that the course of the disease was decidedly prolonged in comparison with the time taken when antiseptic methods were employed. Various tubes and appliances for securing the tubes were tried from time to time, resulting in finding that a safety-pin passed through a rubber tube, the easiest to manage, and the most simple. I also found that two tubes were preferable to, and more likely to work well than one, and that the size of the tube was determined by the individual width of the intercostal space, the largest which could be introduced into the cavity without being pinched by the ribs, and thus interfering with the flow of pus, being the best. The cases now under consideration were treated in exactly the same manner, and, it is believed, with equal care as to antiseptic details, such as cleanliness, and thorough disinfection of hands, instruments, and dressings; both cases were in private families, and both were subjected to the same climatic changes in Boston during the spring of 1885; both recovered completely, without deformity, and with apparently sound lungs, so that they show how, under the same conditions, the disease can vary in its course:

Case I being short, fifty days; tube in twenty-four days; Case II being long, three months; tube in sixty-seven days.

CASE I. A boy, eighteen months old, well-developed; always well until April 26th, 1885, when he was suddenly attacked with fever, pain, and restlessness. Temperature 102°, pulse 160, respiration 60; no vomiting or nervous symptoms. April 27th, temperature 103°, respiration 80; grunting in character; decubitus right side, child screaming with pain when turned on left side; slight cough; auscultation and percussion of heart and front of chest normal; resonance slightly diminished in right back; no râles or bronchial respiration; left back normal.

During the next few days, numerous fine, moist râles were heard over the right back, and dulness gradually developed over the back, the axillary region, and apex in front.

May 8th. The dulness changed to flatness; the râles disappeared, and the respiration was scarcely perceptible in the area of flatness behind. Aspiration was performed in the seventh interspace, at the angle of the scapula, and three ounces of clear, inodorous pus removed, when the resonance became fair in lower back, with tubular breathing and a few fine râles; the temperature then went down from 101 to 99.5°, the respiration from 80 to 60, and the child was much brighter.

May 11th. The flatness returned, and four ounces of rather thicker pus was removed with the aspirator, and one ounce on the 14th.

May 18th. The temperature was 102.4°, and as the fluid continued to return, ether was given, and (Dr. Ruddick and Dr. H. L. Burrell being present) an incision was made in the eighth interspace in the anterior axillary line, one and a half inches long; two or three ounces of odorless pus escaped, two tubes were introduced one inch into the chest, secured by a safety-pin, and an antiseptic dressing applied.

May 19th. Comfortable until the afternoon, when he began to be restless and to have a heightened temperature; and on the 20th, was reported to have cried all night, and was found to have a temperature of 102°. The dressing was changed, and clots of somewhat tenacious pus, about a handful, were washed out with a solution of corrosive sublimate, 1 to 10,000; a pint of the solution was used, and a block-tin sound to break up the clots; the tubes were left one-half inch in the chest. The temperature then fell to 98.5°, and the child began to gain and to have a good appetite.

On the 29th, one of the tubes was removed; the dressing was only changed when there was evidence of soakage, when it was done at once. On the 31st, as there were only a few drops of pus on the dressing, and these of rather a serous character, the remaining tube was removed, and the child walked out and rapidly regained its strength; on the 5th of June, however, the temperature went up to 102° and the tube was replaced, considerable pus flowing out. On June 11th, the tube was permanently removed, and later in the summer, the child was reported to be perfectly well, the lung apparently being normal on auscultation and percussion.

There is nothing but a normal course to record in this case, with the exception of the first forty-eight hours after the operation, when, instead of the temperature going down and the patient being comfortable, the old symptoms continued until relieved by washing out the cavity. This episode, however, is of considerable

interest in respect to the treatment of the case at the time of the operation, that is, whether the cavity should be washed out at once, to ascertain whether the pus is too thick to flow through the tube, or whether we shall take our chances of this occurring, as it is the exception, rather than the rule. In my former cases, where I always washed out at the time of the operation, I obtained entire relief to the symptoms at once, so that I was at first rather inclined to irrigate with a disinfectant in the antiseptic cases before adjusting a dressing; but the experience with reference to this formation of pus-clots, which came to me in Case II, seemed to show that the clotting can take place at any time, either before or after the operation; and that, therefore, it may be wise to wait for some sign that nature needs assistance in accomplishing an uninterrupted flow through the tubes, before introducing foreign matter into the thoracic cavity. The age of this patient, eighteen months, is also a point of interest in the case.

CASE II. A girl, four and a half years of age, with a history of measles two years previously, and a chronic otorrhœa following, and lasting up to the time of the present attack; otherwise strong and well until April 15th, 1885, when, in the morning she was very well, and had a normal temperature, but later in the day, began to complain of pain in the sternal region, and when seen at 2 P. M., had a temperature of 103° (axilla), respiration 60, pulse 165, and nothing abnormal found on physical examination.

7 P. M. Temperature 104°. Dr. Minot in consultation; nothing abnormal discovered.

April 16th. Temperature 104°, pulse 165, respiration 66 (grunting in character); slight dulness in right axillary region and respiration rather tubular; urine passed involuntarily; mind clear; pain on being moved, and when placed on right side, cries out continuously until turned on to back.

April 17th. Respiration 84, pulse 165 (intermittent); slight cough; coarse, sonorous râles over both fronts; a little dulness in right back; auscultation and percussion, otherwise normal, excepting slight area of dulness over upper part of sternum. The child always refers her pain to the upper part of the sternum, on the right side. On the 18th, a few râles and dulness were found over the right front and sternum, and the heart's apex was a little to the left of the mammary line; also, a friction-sound was heard at the right edge of the upper part of the sternum, some dulness in the axillary line, and a few moist râles in the right back, with lessened percussion resonance, but no dulness.

By the 20th, the friction-sound had disappeared, bronchial respiration was heard at the right apex, in front and behind, and the dulness extended to the right back. Temperature 100 1-5°, respiration 84, pulse 165, regular.

Up to the 23d, the dulness was decidedly most marked in front, but by the 27th, there was flatness over the whole of the right lung, front and back, with bronchial respiration. Temperature 100°; no cough. On the 30th, aspiration was performed in the seventh interspace, just outside of the angle of the scapula, and one ounce of thick pus withdrawn.

May 2d. Pulse 165, respiration 60, temperature 101°. Ether was given (Dr. Minot and Mr. J. Perkins, interne at the Children's Hospital, being present), and with carbolic acid spray, and the antiseptic precautions employed in Case I, an incision was made in the eighth interspace, in the posterior axillary line; one pint of

inodorless pus escaped, two tubes were introduced, and the antiseptic dressing applied. 6 P. M., temperature 98.5°.

May 3d. Reported to have had a restless night. 8 A. M., temperature 101°, pulse 165, respiration 60; tube found to be pressed upon by the dressing; heart's apex in position; gurgling râles and cavernous respiration all over right lung, and in an hour or two, temperature 98 4-5°, pulse 135, respiration 45. The temperature then remained normal, and the patient steadily improved until the 12th, when she began to have an evening temperature of 102°, and respirations of 60; and as this continued for several days, the dressing was removed on the 15th.

Very little discharge was found on the dressing and no odor; a probe passed through the tubes entered the pleural cavity freely; Labarraque's solution 1-16 of water was then injected and ran in and out freely, very little pus coming out with a small amount of coagulated fibrin, and a few little blood clots; the dressing was then re-applied and the temperature found to be 99°; six hours later it went up to 103°; the dressing was then again removed, the tubes taken out and a block-tin sound introduced and gently moved about in the cavity; the Labarraque's solution was then again injected and some thick clotted pus came away; new tubes were introduced. May 16th, the child was screaming with pain and was reported to have had an almost sleepless night. Temperature 101°. Pulse 150. Respiration 50; the dressings and tubes were again removed and a female catheter attached to a fountain syringe was introduced between the ribs and Labarraque's solution injected; large dense tenacious clots (a basin full) then with great difficulty came through the wound; the clots did not merely look like those described in Case I, but it seemed as if some chemical reaction had taken place between the Labarraque's solution and the pus, rendering it a dense mass, which by no possibility could flow through a tube; the dressing was then re-applied, but although the temperature went down the child was restless and looked very badly, so that on the next day it was deemed best to remove the dressing and I then thoroughly washed out the pleural cavity with a solution of corrosive sublimate 1 part to 10,000 of water; a few more of the tenacious clots came away, the tubes were shortened one-half inch, and the child had the first good night which it had had for some time; the sternal pain disappeared; the temperature became normal and the child rapidly gained, there being occasional complaints of sternal pain and slight rises of temperature, easily controlled by changing the dressing and injecting the corrosive sublimate. May 27th, one tube was permanently removed, and the child walked for the first time. At times the tube had to be introduced further and again shortened. June 2d as there was only a little serous discharge and the child was doing well the remaining tube was removed, and two days later the auscultation and percussion was almost normal, excepting that the respiration was rather harsh at the base behind, and that there was a small area of dulness in the axillary line around the wound; three days later, June 7th, the child was looking badly and had a temperature of 103°, quick shallow respiration and pulse 160. Ether was given and the tube introduced, when two or three ounces of clear inodorless pus came away; the child then began to improve and to have a normal temperature, and was taken to Beverly on the 10th;

from this time, with an occasional bad day from the tube getting clogged, she grew stronger and played out of doors with, however, decided left lateral curvature and raising of the left shoulder. The tube was not removed but gradually shortened by altering the position of the safety pin, and on July 8th the tube was permanently removed by simply letting the wound close up around its pleural end and gradually push it out. The auscultation and percussion of the lung soon became normal excepting a slightly dull area around the wound; the lateral curvature soon passed off, having existed for two months. In December the child, who is passing the winter at the Lake of Geneva, was reported to be perfectly well, excepting that the chronic otorrhœa returns from time to time.

The points of especial interest in this case were the obstinate and unaltered dorsal decubitus lasting for weeks, the sternal pain and the unusual behavior of the pus when Labarraque's solution was used. It is also to be noted in this case that instead of being able to withdraw the tube at once when the discharge became serous, as is usually a safe procedure, I had to gradually shorten the tube from the outside allowing the cavity to close around it and finally push it out, for complete withdrawal of the tube always made the temperature go up. As to the fluid used in washing out the pleural cavity, corrosive sublimate is disinfecant at 1 to 10,000, is without odor, and so far as I know has not caused any symptom of poisoning when diluted to this extent; it was freely used in both cases.

IV. TWO ATTACKS OF PLEURITIC EFFUSION, CLOSELY FOLLOWING EACH OTHER, ON OPPOSITE SIDES OF THE CHEST.

CASE IV. A boy, thirteen years old, always well and strong, came to the City Hospital for treatment November 9th, 1885. Three weeks previously he fell into some water and was soaked from head to foot; in a few days he began to have pain in his left side and to cough. On physical examination the apex of the heart was found in the line of the epigastrium and there was flatness on the left side of the chest in front and behind nearly to the apex of the lung, with diminished respiration. November 23d he was aspirated and fourteen ounces of clear yellow serum withdrawn. November 28th the apex of the heart was found to be in position; there was lessened resonance on percussion and diminished respiration, but no râles; he had gained in weight and strength, had no cough and looked and felt well. He was then discharged and was perfectly well until December 23d when, without known exposure he had a chill and began to have pain in his right side, with dyspnoea and cough. He entered the hospital again January 7th, 1886, and was found to have flatness in the right side of the chest below a line corresponding to the angle of the scapula and the mammary line, the flatness extending a little higher in the axillary line.

In the area of flatness the respiration was much diminished; the vocal resonance and fremitus were decreased; the heart's apex was displaced to the left of the mammary line two c. m. At times a few moist râles were heard in the back, but these disappeared and the fluid after increasing for a few days, diminished; the boy gained in weight and strength and on the 28th is reported as feeling perfectly well. February 1, 1886, auscultation and percussion of the left lung were about normal; the apex of the heart was in posi-

tion. Percussion of right lung fairly good; no râles; respiration diminished and about the same as was found in the left lung at time of second entrance to hospital. Vocal resonance and fremitus equal on both sides.

[Dr. Rotch exhibited the patient with the line of pleuritic effusion on the left side, and the heart displaced to the right; signs of the first attack, marked in red, and the pleuritic line on the right side and the heart displaced to the left; signs of the second attack, marked in blue.]

SYMPTOMS OF RENAL AND VESICAL CALCULUS IN A BOY TEN YEARS OLD.

A boy ten years of age had been moderately strong and well for some years; he has from time to time had incontinence since he was three years old, and at one time was for a short period unable to control his fecal discharges; he had measles in the summer of 1865, and then although he did not have any especial symptoms, looked pale, lost in weight, and got tired easily, but he went to school and no complaint was made until November 2d, 1885, when he began to pass his water frequently, the desire coming suddenly; the water passed freely but caused pain referred to the end of the penis, and there was also irritation and pain about the prepuce. (No incontinence.) The prepuce was then retracted twice daily and carefully washed, and in four days the pain had disappeared from the prepuce and penis and was referred to the lower part of the abdomen; this pain was less when he rode on horseback, but increased when he sat down quietly. On the 8th he complained of considerable pain over the pubes. Pulse 81, temperature 98°, urine, sp. gr. 1.020; reaction acid; no albumen; heavy sediment of urates; under the microscope the whole field was found to be covered with uric-acid crystals.

November 9th. The urine was examined by Dr. Hills, with the following result: Color normal; specific gravity, 1021; reaction, acid; amount of sediment, considerable; urophæn, slightly diminished; indican, normal; urea, normal; chlorides, normal; ether phosphates, normal; alkaline phosphates, normal; albumen absent; bile pigments absent. Sediment, normal amount of epithelium, some excess of mucus, an occasional crystal of oxalate of lime.

November 10th. Dr. Hills also found numerous uric-acid crystals.

December 1st. No sediment; neutral.

December 12th. Uric-acid crystals, and a few pus corpuscles; reaction, acid.

November 9th. The boy was then ordered to drink six or seven tumblers of Belmont Spring Water daily, with two or three grains of bicarbonate of soda in each tumbler, and on November 12th, he was restricted to a liquid diet. He, at times, had spasmodic pains in the bladder before and after passing his water, and attacks of vomiting and diarrhœa. The amount of the twenty-four hours' urine was about twenty ounces.

November 21st. The urine contained no uric acid, and he was without pain, still, however, passing his urine frequently. The soda was simply used to the extent of rendering the urine less acid.

December 7th. He complained of spasmodic anal pain and irritation; nothing was found on examination, and these symptoms were relieved in a few days by enemata of sweet oil.

December 9th. He was reported to have attacks of

pain in the region of the bladder, so severe, that his parents said that he rolled on the floor in agony, and he was confined to the bed for several days, with pain and frequent micturition. Uric acid in urine.

December 13th. Ether was given, and he was carefully sounded by Dr. E. H. Bradford; nothing abnormal was detected, excepting a slight feeling of resistance at the neck of the bladder, and a small adhesion on one side of the prepuce, which was torn away. The boy came out of his ether well, and for the next few days, seemed better and took solid food (for about twenty-four hours after being sounded, he had great pain on passing his water). The paroxysms of pain gradually grew less, and disappeared on the 19th.

On the 24th, he went out to drive, and he seemed to be improving, although considerable pus was found in the urine, but from the time of the sounding, no uric acid was found in the urine.

On the 26th, he had nausea, pain in right side of abdomen, passed his water frequently, though without much pain, was fretful, and in bed all day, and in the middle of the day, his temperature went up to 104°.

December 27th. Temperature 103.5°; too sick to get out of bed, drowsy, so weak that he can hardly stand; in the night, very restless, and passed a great deal of urine.

December 28th. Feels better, but pain and tenderness continue in right side, and there is some tenderness on pressure over the pubes.

December 29th. Dr. Hills reports as follows: Urine, color pale. Reaction, acid; urophæin diminished; indican diminished. Urea diminished; uric acid diminished; specific gravity, 1013; amount of sediment, considerable; chlorides normal; ether phosphates diminished; alkaline phosphates diminished; albumen, a trace; sugar absent; bile pigments absent. Sediment, considerable pus; an occasional blood-globule, a considerable number of small, round epithelium cells, which, so far as their size and shape afford any indication, may come from the tubules of the kidney, or from the prostatic portion of the urethra. As there are no casts, the epithelium without doubt comes from the prostatic portion of the urethra, and localizes the inflammation at this point. There is no excess of large bladder epithelium, so that the fundus of the bladder is apparently not involved. There are, however, a few cells resembling those found about the neck of the bladder, so that there may be a slight catarrh of the mucous membrane of this region. There is no evidence of any trouble in the kidney, or pelvis of the kidney, and no evidence of stone. The trouble is probably catarrh of the prostatic portion of the urethra, extending possibly into the neck of the bladder.

December 30th. Temperature 104° in the afternoon, and some pain in the back of the head, as well as the abdominal pain.

December 31st. Temperature 98°; feels better; appetite has returned; no pain on passing water. Two loose operations from bowels without pain. Pulse 75, regular. Less tenderness of abdomen. Passes a great deal of urine, but much less irritation about bladder. He then began to steadily gain in weight, strength, and color; the pain disappeared from the side, and the tenderness over the pubes grew less. He was up and about the house, but too much exercise or excitement at times caused a return of the pain.

January 19th. Dr. Hills reports as follows: Urine, color pale; specific gravity, 1012; amount of sediment,

slight; albumen, slight trace. Chlorides normal; urophæin, indican, urea, uric acid, ether phosphates, and alkaloid phosphates diminished; sugar and bile pigments absent. Sediment, rather more small pus cells than normal; hardly more bladder epithelium than normal. Amount of twenty-four hours' urine says from three to four pints, but he is drinking about that amount of water daily.

January 31st. Has been steadily improving; slight tenderness over pubes, but no pain elsewhere, or in passing water. Urine normal. The boy is apparently well; the treatment has been, mainly, giving him large quantities of pure water to drink, on the ground that the great excess of uric acid in the urine might be causing, or rather exaggerating, his various nervous symptoms, and diluting the urine, apparently giving relief to this condition.

RECENT PROGRESS IN PUBLIC HYGIENE.

BY SAMUEL W. ABBOTT, M.D.

SPREAD OF SMALL-POX BY HOSPITALS.

FURTHER important observations in addition to those already noted, are published in a recent report by Dr. Murphy, late medical officer of health on the sanitary condition of Highgate and Hampstead as affected by the small-pox hospitals located therein. The conclusions arrived at are that in the four years, in which the Hampstead Hospital was closed, the houses immediately surrounding the hospital were attacked less than others in the parish. In 1884, when it was reopened these houses suffered three times as much as the rest of the parish. The same was also true of Highgate Hospital. While confessing that the distribution of the disease did not warrant him in expressing any definite opinion on the question whether the disease was spread through personal communication, or was aërially diffused, he considered that the evidence afforded, tended to show that their small-pox hospitals as at present constructed and managed were a means of disease to the neighborhood in which they were placed.

Hence the propriety of selecting sparsely settled districts, remote from habitations for the site of such hospitals.¹

REGISTRATION OF NEW CASES OF SMALL-POX.²

Dr. S. Wolffberg suggests the following points of information as desirable to be ascertained in each new case of small-pox.

(1) Age; gender. (2) Date; Course and result of disease. (3) Has patient had small-pox before? When? Was it confirmed by a physician? (4) Was patient vaccinated? When? With what success? That is, how many scars to be seen at time of occurrence of small-pox? With what kind of lymph? (5) Was patient revaccinated? When? With what success? Are these traces of revaccination at time of occurrence of small-pox? With what kind of lymph was revaccination performed?

VACCINISATION.

Dr. Titeca³ concludes that the principle of vacci-

¹ Local Government Chronicle, February 6, 1886, page 112.

² Centralblatt für Allgemeine Gesundheitspflege. Erstes heft, 1886, page 24.

³ Etude sur la pratique de la Vaccine, ce qu'elle est; ce qu'elle devrait être, par le docteur Titeca. Bulletin de l'Acad. r. de méd. de Belgique. 3 ser. t. xix. No. 6. 1885.