story of injury from a fall or accident, or of spinal disease; perhaps the fact of carrying heavy weights.

There are extreme shortening and a pendulous abdomen. Examination shows the ribs lying close to the ilia. The shoulders are carried well back, as the patient stands in lordosis. There may be lumbar crepitus, felt while walking. The vulvar opening, due to the change in pelvic inclination, presents anteriorly as the patient is standing or sitting. By vaginal examination the bodies of the projecting vertebræ may be easily felt and the contracted outlet also noted. The limitation at the pelvic brim precludes any possibility of a normal fœtal head engaging.

Tumors of the pelvis may be of large size and may almost obliterate the pelvic cavity, or they may be merely bony excrescences springing from the region of the pelvic brim. They may grow from the inner surface of the symphysis, from the sacro-iliac joints, or from the ileopectineal line. If sharp they form what is known as the pelvis spinosa. The projecting bits of bone may cause dangerous circumscribed pressure on the child's head. The larger tumors may be enchondromata, sarcomata, or carcinomata. They necessitate embryotomy or Cæsarean section. Fractures of the pelvis rarely may cause deformity from the growth of callus.

Ankylosis of the sacro-coccygeal joint, which normally occurs after the menopause, may happen prematurely and furnish some resistance to the passage of the child's head. The uterine contractions are usually of sufficient force to fracture the bone. Sometimes the head is held by this deformity until the bone is artificially fractured or the forceps is applied. With the fracture a snap is sometimes plainly heard and the head thereafter advances readily. The fracture of the bone should be accomplished under chloroform, the thumb and forefinger of the accoucheur grasping the coccyx.

Fig. 3760.—Lumbar Kyphosis. (Service of Dr. Edwin B. Cragin, Sloane Maternity Hospital.)

The consideration of pelvic deformities is incomplete without a word concerning *prophylaxis*. The possibility of the results of rachitis upon the pelvis should make the mother careful about the feeding of the infant, its general hygiene, and especially about its allowance of fresh air. Early attempts at walking should be forbidden, especially if the infant is heavy. The effect of disease or deformity of the skeleton of the female child upon the pelvis is an argument for early consultation with the orthopedic surgeon and the early correction, if possible, of existing deformities.

When the deformity exists in the child-bearing woman the obstetrician must be able to recognize the deformity, and by trained judgment determine its probable effect on labor. The question may arise whether the patient is warranted in entertaining the hope of having children at all, or, if she be in earlier pregnancy, whether the deformity calls for an induction of premature labor. Should the patient be in labor, other conditions must be taken into account. These are: the extent of obstruction presented by the soft parts, the relative size of the child's head and its capacity for moulding, the force of the labor pains, and lastly, the ability of both mother and child to withstand the strain of delivery. The history of previous labors is of value, but it must be remembered that the size of the child tends to increase up to the fifth or sixth pregnancy.

Fig. 3761.—Kyphosis so Extreme as to Necessitate Cæsarean Section. (Service of Dr. Edwin B. Cragin, Sloane Maternity Hospital.)

If the child is small or premature, slight pelvic deformity may have no significance; and yet with a child above normal size this defect may constitute a serious obstruction. Such cases of overgrowth of the child are occasionally met with, and are the result of a large father, overnutrition of the fœtus from the mother, and sometimes of the prolongation of pregnancy one or more weeks beyond normal.

Those cases of slight obstruction, in which delay occurs in the second stage, justify a waiting policy. Nature with time will accomplish sufficient moulding in a safer way than if forceps were used. Good judgment requires that one know how long it is safe to allow this moulding to continue. Too long compression of the head gives danger of intracranial hemorrhage. Too long-continued pains expose the mother to exhaustion and shock, and ultimately to a tonic uterus with possible rupture, or an exhausted uterus with resulting postpartum hemorrhages. On the other hand, early interference before the head has had time to mould will expose both mother and child to needless trauma. Account must be taken of the force and frequency of the pains; the maternal pulse, and evident amount of suffering caused by the pains; the rate and force of the fœtal heart; and the amount of moulding, as shown by the caput and overlapping suture, and by the advance of the child's head.

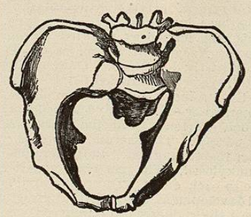

Fig. 3762.—Obliquely Contracted Pelvis. (After Duncan.)

In some cases the severity of the pains or the poor condition of mother or child may necessitate operative delivery before the patient has been in the second stage an hour. In other cases in which the uterine contractions have been of poor quality some good may be accomplished by a delay of several hours. Uterine action may be stimulated meanwhile by tonics, such as strychnine or quinine. The erect posture increases the force of the pains. In cases with a flat pelvis some increase in the conjugate, from 0.5 to 1 cm., may be accomplished by the Walcher position. The patient lies in the dorsal position with the thighs extended over the end of the table, and the feet barely touching the floor. If there is some advance of the head, pressure on the fundus, during the pains, may be tried.

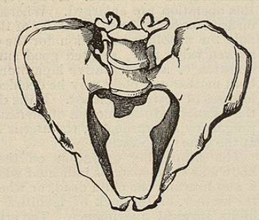

Fig. 3763.—Robert's or Double-Obliquely Contracted Pelvis. (After Duncan.)

For the more extreme degrees of dystocia, due to deformity, there may be used the forceps, podalic version, usually combined with breech extraction, the induction of premature labor, symphyseotomy with forceps, the Cæsarean section, craniotomy, or, in the cases of extreme contraction, craniotomy with evisceration.

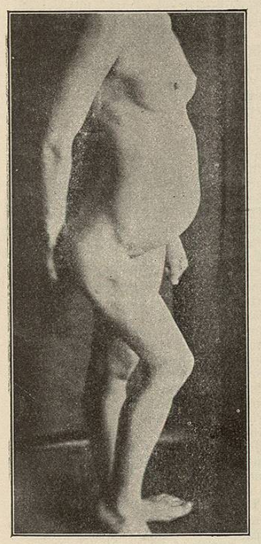

Fig. 3765.—Obliquely Contracted Pelvis, Following Coxitis. (Service of Dr. Edwin B. Cragin, Sloane Maternity Hospital.)

The low forceps operation for deformities of the pelvis is usually necessary in those cases of limitation of the pelvic outlet, as in the kyphotic cases or those of the masculine type. In the worst kyphotic cases symphyseotomy may be necessary. The medium forceps operation is more common in the generally contracted pelvis. For the flat and generally contracted pelves high forceps may be needed. In justo-minor pelves, the only possibility of safe delivery by the natural route lies in extreme moulding of a well-flexed vertex.

In the flat pelvis the indication for high forceps is not always so plain. The head in these cases coming down in the transverse diameter must often be grasped by the forceps with one blade applied to the occiput and one blade to the face. The effect of traction then is partly to mould the head so that the biparietal diameter tends to widen. As has been described above, the after-coming head in a breech extraction accommodates itself in such a way that the bitemporal diameter engages the narrowed conjugate. For this reason version and breech extraction are frequently resorted to, in cases of flattening, with good result.

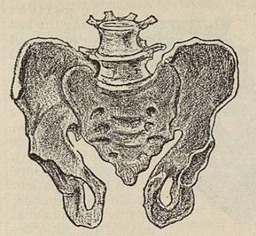

Fig. 3764.—Pelvis in which the Pubic Rami Fail to Meet at the Symphysis. (Schauta.)

If the head, in case of a flat pelvis, is engaging well, forceps may be tried gently. If the head persists in not engaging, version is preferable provided there is a reasonable possibility of bringing the head through. If in the case with the head engaged the forceps fail to accomplish advance, the head may be disengaged and version tried. It must be remembered that the version is of value only in the simple flat pelvis which is ample in other measurements. In a flat justo-minor pelvis version is worse than useless.

Where the conjugate is quite short, the head may be prevented by the deformity from descending far enough to dilate the cervix. In such a case, before any operative delivery is attempted, the cervix should be carried to full dilatation by means of the hydraulic bags or by digital stretching.

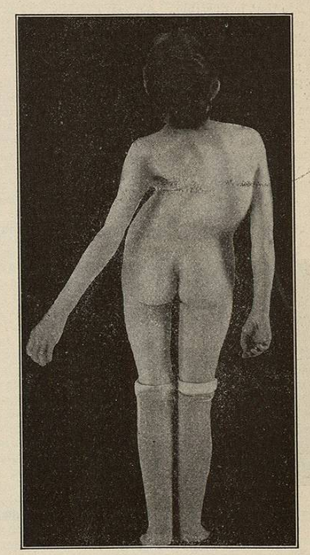

Fig. 3766.—Simple Scoliosis. Patient delivered by low forceps. (Service of Dr. Edwin B. Cragin, Sloane Maternity Hospital.)

The *induction of premature labor* in selected cases is

an operation which has a most important field of usefulness. If the pelvis is small and the head seems to be riding high, or if a woman habitually has larger children than can safely be born, it is proper carefully to watch the patient during the last two months of gestation and to terminate pregnancy at any time when the child's head seems, relatively to the pelvis, a close fit. Once a week the patient should be examined, and by the bimanual method the ratio between the size of the head and the diameter of the pelvis carefully estimated. There will be a certain proportion of disappointments, but what might be otherwise fatal dystocia will be avoided, and in many cases a healthy child secured.

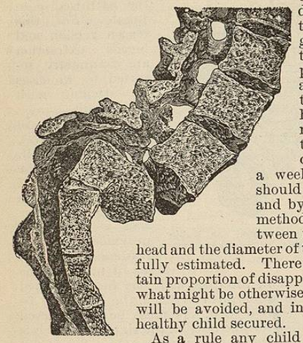

FIG. 3767.—Spondylolisthesis. (Neugebauer.)

As a rule any child of over eight months' gestation will do well with proper care, and sometimes one even younger will thrive. The success depends on the judgment of the physician, who should allow to the infant every week of intrauterine life that is possible. An error either way is bad. If the operation is delayed too long, the premature infant will resist very poorly the manipulation necessary for an operative delivery. If labor is induced too early, the child is robbed of just so much vitality.

The operation of *symphyseotomy* has lost favor in the last few years because of the risk of infecting the mother, or of leaving her permanently crippled from failure of union of the symphysis, and because of its uncertain results as compared with the good results of a properly performed Cæsarean section. It must be restricted to cases in which the possible separation of the pubic bones of 7.5 cm. will enlarge the pelvic canal sufficiently to allow the head to pass. It is of no value in those cases in which the sacro-iliac synchondroses are ankylosed. The tedious convalescence of the mother is a serious matter.

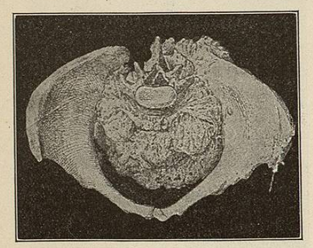

FIG. 3768.—Enchondroma of the Sacrum of such a size as to Diminish very greatly the Capacity of the Pelvic Cavity. (Behm.)

Compared with the Cæsarean section, it is the more dangerous, more uncertain of the two, and of greatly restricted range of application.

The *Cæsarean section* must be employed in those cases in which there is no other possible method of delivery of the child, living or dead (the absolute indication), or it may be employed (the relative indication) in cases in which delivery of a living child is possible only by laparotomy. The indication has been extended, by some, even to those cases in which delivery of a living child is improbable except by laparotomy.

This operation in properly experienced hands seems to promise great usefulness. Every year the indications for this operation are enlarged. Whereas a few years ago, on account of the great mortality of the Cæsarean section, only the absolute indication for the operation was considered valid, now, granted good surgical facilities, the question of a conservative laparotomy in the interest of both mother and child may be decided in the affirmative in cases of obstructed labor. If the deformity is so great that a successful induction of premature labor in a later pregnancy is improbable, the uterus should be removed at the time of operation.

The mutilating operation on the child, commonly known as *craniotomy*, is indicated where the obstruction is absolute and the child dead, or where the condition of the mother, or the lack of facilities for operating, prohibits surgical interference. The crushing followed by traction on the head is usually sufficient to effect delivery without much additional shock. Rarely, if the child is of large size, evisceration or further mutilation of the child must be resorted to. *Franklin A. Dorman.*

PELVIC CELLULITIS.—DEFINITION.—Pelvic cellulitis is an inflammation of the pelvic cellular tissue which may or may not go on to abscess formation. The same condition is also described sometimes as parametritis, perimetritis, pelvic abscess, etc.

ANATOMY.—Before describing pelvic cellulitis, a few words as to the anatomy of the pelvis will be necessary. Rosthorn defines the functions of the pelvic cellular tissue as follows: 1. It serves as a material to fill in empty spaces between the organs. 2. It serves to connect the peritoneum to the underlying organs. 3. It serves as a sheath for the blood and lymphatic vessels. 4. It serves as ligaments, holding the various organs one to the other and to the surrounding bony structures. We can see, therefore, that the connective tissue is freely distributed through the pelvis and forms the loose framework in which lie the organs. The denseness of this tissue varies according to its function and position. In places there is a distinct thickening, forming, if we may call it so, a species of curtain, which divides one portion of the pelvis from another and tends to localize infection to one part of the pelvis, though when an abscess forms it may be easily imagined as breaking through the septa. These septa or curtains are difficult to demonstrate by dissection, and the most striking way of showing their relations is by the injection of material which will harden *in situ*. By this method three main regions are found to occupy each side of the pelvis. (1) The anterior region comprises the cellular tissue around the bladder and that lying anterior to the cervix, there being a connection between these regions on the two sides through the cellular tissue binding the posterior surfaces of the bladder to the anterior portion of the cervix and uterus. (2) The next region is bounded anteriorly by the above-described partition, posteriorly by a second curtain which extends from the uterus outward along the infundibulo-pelvic ligament, giving to this area a rough triangular shape with the base directed toward the pelvic wall and the apex toward the uterus, and including practically all of the connective tissue lying in the fold of the broad ligament and continuous with the cellular tissue filling the iliac fossa. (3) The third, or posterior area, surrounds the rectum and is continuous with the cellular tissue of the retroperitoneal area.

Besides these three main divisions, anatomists describe several less well-marked areas where an infection may be localized.

ETIOLOGY.—Infection of the cellular tissue is always due to the attack of one of the pathogenic bacteria, and, according to whether the bacteria gain entrance directly to the cellular tissue through a wound or by lymphatic infection, or whether the infection follows by direct extension from inflammation of the tube or other pelvic structures, we divide the cellulitis into the primary and the secondary forms.

In the primary forms the cellular tissue is invaded directly by the disease-producing bacteria, generally through a tear or wound in the cervix or uterus, or by direct lymphatic extension.

In the secondary form the seat of infection primarily is the tube, ovary, bladder wall, or rectum, the cellular tissue being invaded by contiguity. The primary cellulitis is the rarer of the two, and for some years its possible occurrence was denied.

Wounds of the cervix are not frequent in any condition save that of childbirth, and this is by far the most frequent etiological factor in primary cellulitis, the bacteria being introduced by the unclean finger and advancing directly into the tissues. In an occasional case the infection also results from a wound of the cervix from careless dilatation, or from the use of the uterine sound or other instrument in such a manner as to cause a puncture through the vaginal wall of the cervix or the uterine wall.

Secondary cellulitis of some part of the pelvic tissue accompanies almost every case of distinct inflammation in any of the pelvic organs. Most frequently the condition follows salpingitis or pyosalpinx, the tube being the most frequent site of inflammation in the female pelvis.

MORBID ANATOMY.—The pathological picture presented in this disease varies according to the type and the degree of virulence of the infecting organism. Most of the cases of primary cellulitis are due to invasion of the tissue by the streptococcus, and naturally the picture of a virulent infection is given. If the tissues be examined early enough all that will be noticed is a brawny infiltration of the loose tissue, which on minute examination is found to be due to a rapid proliferation of round cells and to the effusion into the tissues of serum and leucocytes. Later, we find distinct small abscesses scattered through the tissues, the size of the abscesses varying from the point to the head of a pin. Still later, if the infection continues and the patient lives, we find that the numerous small abscesses have become conglomerate, and that a distinct abscess has been formed. Not infrequently, however, an abscess does not form, but, instead, the tissues appear to gain a certain amount of resistance against further breaking down, and in place of the conglomerate abscess a slow absorption of the minute abscesses present and a gradual healing take place. In the secondary infections we are less apt to find abscess formation, especially if the infection is due to a not extremely virulent species of microorganism (the gonococcus, for example). Naturally, when the tubal or ovarian disease is due to infection by the more virulent organisms, we find more frequent abscess formation, generally in the folds of the broad ligament. As already stated, in the primary forms the streptococcus, either alone or in company with one or more of the other organisms, is the cause of infection. In the secondary cellulitis the gonococcus, the staphylococcus pyogenes albus and aureus, the typhoid bacillus (rarely), the proteus and certain other rarer forms, have been isolated from the tube or ovary and evidently would be found in the focus of secondary infection.

SYMPTOMATOLOGY.—*Primary Cellulitis.*—In this form the symptoms are usually quite well marked. Generally three or four days after a labor in which careful asepsis has not been observed, or in which there has been much handling, the patient will have a distinct chill, the temperature rising to 102° or 103° F. She will complain of general malaise, violent headache, possibly nausea, and of acute pain in the lower abdomen, generally located in one side or the other. On examining such a patient the lower abdomen will be found somewhat full, and palpation will be impossible from the amount of muscular spasm present. In making a vaginal examination a sense of resistance will be found at the base of one of the broad ligaments, the uterus will also be found to be somewhat more mobile than it should be, and the patient will complain of extreme pain when we attempt to move the uterus or make pressure upon the lateral fornices. After a day or two a distinct induration will be felt through the vagina, and on bimanual palpation a moderately-sized mass will be felt lying in the broad ligament; in some cases this indurated mass can be easily felt above Poupart's ligament as a dense hard tumor.

Secondary Cellulitis.—The symptoms of this form are commonly masked by the primary disease, and it is practically always the primary disease that we are called upon to treat, for, unless an abscess of the cellular tissue be present, the curing or the removal of the primary point of infection will be followed by a slow amelioration or disappearance of the cellular inflammation.

DIAGNOSIS.—The diagnosis of the primary form is based partly on a study of the symptoms, but chiefly on the results of the abdominal, the vaginal, and the bimanual examinations. For if we find on abdominal examination an indurated mass extending up along the anterior abdominal wall; if on vaginal examination the lateral fornix of the same side is found to be hard, dense, and brawny, or possibly depressed toward the outlet; and if on bimanual examination we can outline a distinct mass between our hands, separate from the uterus or enclosing the uterus in its outlines, we may feel reasonably sure that whatever else is present we have an inflammation and probably an abscess in the pelvic cellular tissue.

The diagnosis of the secondary form is not of so much importance if the diagnosis of the primary focus be made, as we may be sure that with pyosalpinx, ovarian abscess, or any collection of pus in the peritoneum, there will be more or less involvement of the contiguous cellular tissue.

TREATMENT.—*Primary Cellulitis.*—In this affection we must be governed by the inflexible surgical rule that, if pus be present, it must be evacuated by the shortest available route, and it only remains for us to decide which would be the shortest route for its evacuation. In many cases it is difficult to be absolutely certain as to whether pus is present or whether the tissues are merely densely infiltrated, and fortunately this need not greatly bother us, as the best results are gotten by breaking down and draining such an exudation. Hence in every case of primary cellulitis, whether the exudation has broken down and pus has formed, or whether merely a dense indurated mass is present, the indication is clearly to provide effective drainage.

There are two paths by which we may get at such a mass and drain it: first, through a vaginal incision; second, through an abdominal incision. The best drainage is undoubtedly gotten through the vagina, as it is the most dependent part, and this avenue of attack is selected in those cases in which the abscess or the indurated mass is distinctly palpable through the vaginal vault, or in which the abscess is distinctly pointing in this direction. The abdominal route is selected in the cases in which it may be difficult or dangerous to make the vaginal puncture, or when the mass is distinctly pointing above Poupart's ligament. To make the vaginal puncture the patient, after being anæsthetized and after the vagina and surrounding parts have been made surgically clean, is brought to the edge of the table with the buttocks protruding slightly over it and the thighs flexed on the abdomen, where they are held by an assistant or by one of the many leg-holders. A final careful examination is then made to outline again the pelvic mass. A Simon's speculum is introduced into the vagina, the posterior lip of the cervix is grasped with the tenaculum, and the posterior vaginal fornix put on the stretch. Then with the knife or scissors a little incision is made in the vaginal vault through the vaginal mucous membrane just back of the cervix. The speculum then having been withdrawn, the forefinger of the left hand should be introduced into the rectum, and the thumb of the same hand into the vagina, the tip of the thumb resting against the incision made in the vaginal vault. Then a sharp-pointed pair of scissors should be carried into the vagina, and under the guidance of the thumb the pointed end of the closed scissors should be placed in the small incision in the vault and at the proper moment plunged boldly into the pelvic mass. The presence of the forefinger in the rectum serves not only to indicate