

downward pressure of about ten pounds more than half the weight of one's body. That is to say, I, who weigh one hundred and ninety pounds, can, for a very short time, exert a steady power of one hundred and five pounds. By throwing my weight suddenly upon the cane in quick jerks, I find that I can tip the beam at one hundred and thirty pounds; and this great weight I certainly have on several occasions thrown on infants' necks. Yet I can confidently say that, notwithstanding this severe strain upon the spinal column, I have broken it but once, and have never failed to save the child whenever its birth was completed soon enough. Should much disproportion exist between the size of the head and the capacity of the brim, it is emphatically a case of "neck or nothing;" and the operator must not shrink from promptly using very great force,—a force, indeed, only just short of detraction. But I do not believe it possible for a physician even to break the neck of a mature child, much less to behead it, if he applies a steady traction-force in the manner above described,—viz., by pushing the neck and body of the child backward and downward, just as he makes downward pressure on the lock of the forceps. Not even when the infant is immature should the efforts of the physician be hampered by the fear of sudden decollation. For the spinal column always yields before the skin and muscles part, and the consequent jerk and the immediate elongation of the neck will give timely warning when to useless force, or, the child being now dead, to end the labor by craniotomy or cephalotripsy. Far better is it, in these emergencies, to kill in attempting to save than to kill by cowardly inaction.

I once saw the strength of the child's neck put to a crucial test, and the result amazed me. I frankly confess that had I not been an eye-witness I should have been a doubter. It was a case of a primipara with flat pelvis and a large but putrid fetus. After craniotomy had been performed, a further obstruction to the delivery lay in the bloated chest and belly. Before this second complication was recognized, each one of the four physicians present, including myself, took his turn at the forceps. From a natural rivalry, the traction thus necessarily made upon the neck of the fetus by three of us in succession was no child's play. But that made by the fourth gentleman, a distinguished member of this Society, exhibited so much power and originality that I shall here describe it. He turned the woman over on her side, brought her lips to the edge of the bed, and applied Hodge's forceps. He next carefully tucked a sheet around the lock of the instrument, removed his shoes, sat in a chair, and placed one foot across the perineum, the other across the vulva. He then grasped the handles, straightened out his body, and pulled with all his might and main, making every muscle in his body quiver with the effort. Yet, in spite of the enormous strain brought to bear upon the neck of the child, it was simply lengthened out, but not broken. The cranial stump was brought down to the outlet, but it literally sprang back at every intermission of the traction. This behavior of the head, or rather of what was left of it, was in fact the

first clue that led to the discovery of the obstructive size of the child's body.

Although these facts show the wonderful tensile strength of the foetal neck, yet, in order to extract the head with a minimum of traction-force, it is of great importance to exert the power to the best mechanical advantage, and to grade it to the resistance. This brings me to the mode of making traction; but in order to understand the subject fully it will be first necessary to study the configuration of the foetal head, and the mechanism of its extraction. In so far as breech-labors are concerned, the foetal head is made up of the frustums of two cones meeting in one common base. One cone is that portion of the head behind the biparietal circumference; the other consists of that portion in front of the same plane. I shall distinguish them by the names of the "fore cone" and the "hind cone." Looking from below upwards,—viz., from the base to the vault,—the head is also wedge-shaped. This I shall call the "wedge." Now, it has been found over and over again, except in those rare cases of uniformly contracted pelvis, that, when an infant is pulled through the brim by the feet, the shorter diameter of the fore cone—viz., the bitemporal diameter—tend to pass directly between the sacral promontory and the pubic symphysis, and the hind cone, together with the large biparietal diameter,—viz., the base common to both cones,—to pass to one or the other side of the two osseous points. The shorter the conjugate diameter the more inflexible is this law. The head thus makes its first movement of descent in an unflexed condition, but there is usually plenty of room in the bisiliac diameter for the occipito-frontal diameter to pass. Again, the distance measured from the chin to the nipped points of the head—viz., the ends of the bitemporal diameter—being less than the distance from the occipital protuberance to the same points, the chin can hardly ever catch over the iliac edges of the brim. Theoretically, the extension of the head by the arrest of the chin over any point of the brim is a possible accident, but practically its occurrence is so rare that it may be left out of consideration. Mauriceau saw but one case; in many thousand labors Madame Lachapelle did not meet with one; nor did Velpeau, who, however, notes one occurring in the practice of Leroux, and another in that of Eckardt. Joulin states (p. 559) that he not only never met with this complication, but that he in vain repeatedly tried to bring it about by forcing the back of the child into the hollow of the sacrum. The cause of this almost invariable adjustment of the occipito-frontal diameter to the transverse diameter of the pelvis is the round and hard surface of the occiput, which glides off to one side of the sloping promontory. The head, therefore, passes the brim in the transverse position and in an unflexed condition. But when it is brought into relation with new pelvic diameters, the greater friction of the broader and harder surface of the hind cone brings about the movements of flexion and rotation.

Granting these premises, it follows that the occipital protuberance is far more likely than the chin to hook over the edge of the brim, and that flexion is