

THE MECHANISM OF LABOR FROM THE NEUROLOGIST'S POINT OF VIEW*

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THE neurologist regards labor with a great deal of awe and regards obstetricians as extremely bold persons who are performing very delicate physiologic experiments with powerful instruments wielded by powerful forces. The neurologist thinks of the fetus as a rather delicate nervous system surrounded by pliable and rather fragile envelopes of bones, muscles, and skin. He visualizes the process of labor as a series of pressure changes involving almost directly the tissues of the central nervous system, and he is inclined to believe that the obstetrician has not carried his conception of the mechanism of labor inside the craniovertebral cavity.

Naturally, nobody has any distinct evidence as to the pressure changes within the craniovertebral canal during labor, but it is possible to reason out a mechanism which seems to fit the known facts. If this attitude is treated with any respect, it follows that the obstetrician is responsible for watching a whole series of phenomena, not from the point of view of progress up or down a canal but from the point of view of shifting pressures within a closed cavity.

During the process of descent through the pelvis the fetal head is subjected to tremendous compression. It seems reasonable to suppose that very little blood enters or leaves the supratentorial cavity. It is, however, obvious that the medulla must be nourished and provided with oxygen. The arrangement of the dural septa is such as to protect the medulla from the severe conditions of pressure exerted on the supratentorial cavities. The compression of the baby in an ordinary head presentation prevents any descent of the medulla by providing an equal pressure from below. This normal mechanism persists until delivery of the head when an almost perfectly devised decompression occurs as the head is delivered. Breech extraction, even if unassisted, removes certain safeguards in the way of equalized pressure, and the breakdown of the mechanism is evidenced by the frequency with which tentorial tears are found.

Another peril that faces the child is the result of persistent delay. Obviously, edema and a resultant anoxemia may occur from this cause also. When interference is deemed advisable, it is obviously possible to work out a method of reenforcing physiologic forces of which forceps delivery is an example, or it is possible to impose an entirely new force, that of traction, as is done in breech extraction.

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The neurologist, looking at obstetrics from a purely theoretical point of view, is impressed with the fact that most obstetric teachers do not seem to emphasize the fact that traction is completely unphysiologic. The mere fact that it is unphysiologic is, of course, of no importance, since practically all surgery is unphysiologic, in its nature. The only quarrel the neurologist has with the obstetrician is that he doubts whether he fully appreciates the nature of the material on which this unphysiologic force is imposed.

If this whole conception of labor is valid, it seems obvious that the obstetrician ought to watch labor as an experiment in control of intracranial and intraspinal mechanism as well as an experiment in forces acting upon an inert mass of tissue.

When the baby is once born, it is, of course, in the highest degree important to decide whether apnea, which may become alarming, is caused by disturbance of intracranial pressure, or whether it is the result of frank chemical causes. Obviously, if the child's intracranial and spinal contents are damaged, the most certain way of causing trouble is to produce further intracranial pressure. The traditional methods of performing artificial respiration should be reviewed with greatest rigidity. In the first place, if the baby has not taken a breath, compression of the trunk can only drive blood into the head. It cannot possibly favor the entrance of air into a collapsed lung. If, therefore, the medulla is inactive through trauma or through long-continued pressure, it seems in the highest degree illogical to handicap this region of the brain further by pumping in more blood. The whole question as to whether or not air actually gets into the lungs with various methods of artificial respiration is, of course, of cardinal importance. Quite clearly, no method that does not get air into the lungs will be effective no matter what the composition of the air is. From the purely experimental neurophysiologic point of view, the Drinker Respirator seems ideal. One of the things that has astonished and rather depressed certain neurologists is the degree of success by which physiologists maintain life in decerebrate animals in laboratories, and the rather prompt death of certain apneic infants.

Nobody is foolish enough to suppose that competent obstetrics can be performed by neurophysiologists. On the other hand, the carrying out of the principles of control of intracranial pressure, and the proper physiologic methods of resuscitation may be of the greatest assistance to the members of an harassed profession who are dealing, of course, with urgent cases.

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