The Journal of the American Medical Association

Published under the Auspices of the Board of Trustees

VOL. XLVI. CHICAGO, ILLINOIS, FEBRUARY 24, 1906. No. 8.

Original Articles

THE PHYSIOLOGIC AND LEGAL STATUS OF THE FETUS IN UTERO.*

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The two most important events connected with a life-history are its beginning and ending.

Embryology has persistently sought to discover and to interpret the earliest manifestations of the former, while pathology, with equal tenacity of purpose, has endeavored to ascertain the causes and incidents of the latter. So far as the beginning of a life-cycle is concerned, embryology has thoroughly established the doctrines of gamogenesis and agamogenesis, the former being the rule among the higher orders of plants and animals, the latter among the lower orders. Reproduction among human beings must, therefore, obey the law of gamogenesis; hence, two ancestors—male and female—contribute to the origin of every new member of the human race, the contributing elements being spermatozoon and ovum, respectively.

While these germ-cells possess inherent vitality and motor power, especially the spermatozoon, neither one can separately and alone evolve itself into a higher or more complex morphologic entity. Put the two together, however, under favorable conditions, and a new unit results, one capable, under proper environments, of evolving itself into a fully-developed human being, that is, the new unit represents all of the potentialities of which the future adult becomes the outward and visible expression.

In contributing the germs they respectively furnish, the male and female have done all they can do toward the creation of the new unit and toward its endowment with physiologic and psychologic functions similar to their own. From that time forth the new being, possessing all of the attributes of living bioplasm—motion, absorption, sensation, and fission, or multiplication—must be the architect and builder of its own body. True, for nine months the female performs the essential and hospitable function of hostess, and generously supplies the young, and presumably welcome, guest with oxygen, inhaled through her own lungs; with food, elaborated in her own digestive system, and with warmth supplied by her own blood, but in fulfilling these high functions she is simply furnishing the material, the brick and mortar, so to speak, out of which the young builder must erect its own corporeal superstructure.

In the work going on, the part played by the female corresponds with the office of brick and mortar carrier, that by the young builder, with the office of skilled artisan, who takes hold of the materials brought and puts them together in the shape and form of a human body. The new being as it grows and develops is not the passive result of work done by the physiologic forces of the female, but is an autochthon, using, however, very refined material furnished by the hostess. The principle is precisely the same as one that prevails in social life. A hostess places dishes, delicious and wholesome, before her guests, but is powerless to force them to partake thereof; they must, by their own volition, take hold of and appropriate the food brought within their reach.

Science does not forbid, on the contrary justifies, the belief that, could the fertilized ovum, before it has formed attachments to the womb in which it receives its fertilization, be transferred without violence to another womb in a similar condition to the first, its career of growth and development might proceed undisturbed. Indeed, could the transfer be made to an artificial womb, or incubator, in which the conditions were identical with those of the natural womb, its growth and development might still proceed undisturbed. The conjunction of spermatozoon and ovum must, therefore, be a great biologic event, one that endows the newly-formed unit with physiologic functions and pyschologic attributes; indeed, makes it, in a qualified sense, an independent human being. Although the powers of this new being are feeble, its potentialities are great, the evolvement of which constitutes the growth, development, and achievements of its life-history.

The cardinal postulate I desire to emphasize is that the vitality, the life-force, and the physiologic functions of the new being reside within itself and not in the hostess. As has been said, the latter sends blood to the fetus, freighted with food and air, but she is powerless to force it to accept either; the new being eats because it is hungry and breathes because it feels the need of oxygen, both acts being vital efforts of its own. Soon after receiving its endowment of physiologic functions the new comer settles down in its velvety and temporary home, prepared by the proliferating lining of the maternal womb, and dominated by an instinct, yea, an intelligence, coeval with its own corporeal origin, proceeds to differentiate itself into bone, sinew, tendon, muscle, blood vessels, viscera, brain, and nerve, and with the skill of a consummate artist fashions these in miniature of an adult human being, the highest type of animal life. The fetus performs these physiologic functions by virtue of its own vitality and power, originally derived, it is true, from the two parental germs, but when these have been consolidated into a new unit—a tertium quid—a self-acting and, in a qualified sense, a self-sustaining human being has been created.

At the end of nine months the silent and unseen artist has filled his temporary home with his living self, whereon the hostess by means of forces marvelously

* Read in the Section on Obstetrics and Diseases of Women of the American Medical Association at the Fifty-sixth Annual Session, July, 1905.

scientific and practical ushers him into the outside world as a plump and rosy baby. When was that baby born, a few minutes ago or nine months ago? Science and logic give one and the same answer. If birth means the act of coming into life, as the dictionaries tell us, unquestionably the baby under discussion came into life nine months ago, and at the end of that period simply changed its domicile. Why not, then, abolish the term conception, which is liable to be more or less misleading and confusing, especially to the lay mind, and substitute for it the more scientific and correct term, birth? This done, then, the one term, delivery, either premature or at full term, would adequately express the transition of the child from intrauterine to extrauterine life. Besides, the adoption of this nomenclature would help to clarify the entire subject of fetal life and would lead to the enunciation of definite, inflexible, and absolutely correct principles of jurisdiction applying thereto. If the baby in question is a living human being when delivered, was it not a living human being the day before, the month before, six months before, eight months and twenty-seven days before? Can a point of time betwixt conjunction of the parental cells and the delivery of the child be fixed before which it did not possess the nature of a human being and after which it did possess the nature of a human being? Did its nature undergo any change between the time at which conjunction of the male and female germs occurred and that at which the baby appeared in the outside world? Was not the nature of the baby the same from the beginning to the ending of its uterine life? Was it not from first to last simply a question of the growth and development of one and the same being, and after the completion of the period of uterine life will it not continue to be a question of the growth and development of one and the same being up to physical maturity?

With these questions answered in the affirmative, as they must be, we are forced to concede that when in the red-hot furnace of congeniality two germs—male and female—are brought together that fuse themselves into one, a new being, crowned with humanity and mentality, comes into life. If this be true, does not the new being, from the first day of its uterine life, acquire a legal and moral status that entitles it to the same protection as that guaranteed to human beings in extrauterine life? Indeed, should it not receive greater protection, for the reason that to the nature of a human being it adds the condition of utter helplessness, a condition that should appeal in mute, but sublime eloquence to the manhood, the womanhood, and, above all, to the motherhood, of those who can shield and protect it? Lives there a man or woman who would assault and slay a little, laughing, prattling babe? If that be a crime from which the coldest-blooded villain would recoil, how much more a crime to assault and slay an innocent babe quietly sleeping in what should be an impregnable fortress—a babe whose voice is hushed and can not be raised in piteous cry for mercy or for help!

Objection to the use of the terms, birth and delivery, in the senses suggested, might be raised on several grounds: First, that it would involve the date of every birth in more or less uncertainty; secondly, that the fact of a birth could not be certainly known for four or five months after it had occurred; thirdly, that no practical benefit would result from the adoption of the proposed nomenclature. Admit that these objections are entitled to more or less weight, yet, when compared with the advantages that would accrue from the change of nomenclature proposed, the objections dwindle into insignificance. A simple formulation of the advantages will be sufficient to force conviction of the utility of the proposed nomenclature:

1. It would be essentially and scientifically correct to locate birth where and when it actually occurs, in spite of the fact that several months would usually elapse before it could be known that a birth had certainly taken place.

2. It would place a pregnancy, from the first day of its probable occurrence to its termination, on the high legal and moral grounds it deserves to occupy.

3. It would dignify the position of the *fœtus in utero,* and would establish beyond all doubt or confusion the right of the fetus to the same protection, moral and legal, as is accorded to human beings who have completed the period of their uterine existences.

4. It would unify the terms, fluxion, abortion, and miscarriage, under the one term, premature delivery; then, two expressions, premature delivery and delivery at full term, would cover the entire subject.

5. It would enable lawmakers to enact clear and definite laws for the protection of the *fœtus in utero,* which laws, jurists and juries could administer without doubt or confusion.

6. It would have a strong tendency to promote virtue and to prevent crime, and to build up in every community a positive demand for the protection of human life at its tenderest and most helpless period; it would tend to educate the people on a subject in reference to which they stand in great need of education and would thereby save the lives of many innocent and undelivered babes.

If the argument thus far be sound and tenable, does not the legal status of the fetus become clear and fixed? It is not strange that before science had ascertained the steps and stages of reproduction the law providing for the protection of the fetus should have been inadequate, but after these steps and stages became definitely established no inadequacy on this point should have prevailed. The common law is conspicuously defective in its provisions for the protection of the fetus. The following quotations on this point are made from the American and English Encyclopedia of law: "According to some authorities, it never was an act punishable at common law to commit abortion with the consent of the mother, provided it was done before the child became quick; but others are not disposed thus to restrict the criminal act, and hold that it may be committed at any stage of pregnancy. If the abortion was committed after quickening, it was punishable only as a misdemeanor. If done without the woman's consent, the act was held to constitute an aggravated assault."

Inasmuch as the common law was wholly inadequate for the protection of the fetus it became imperative that this defect should be supplied by statute law. Quoting from the same authority cited above, it is gratifying to find the following statement: "The statutes enacted on this subject in most of the states fail to draw any distinction between the commission of the offense, or attempt at commission, before and after the quickening of the child in the womb, making it a felony in either case. But some states still retain the distinction, punishing the act or attempt more severely when done after quickening. In Michigan it is essential that the child be quickened. The means denounced by the various statutes are the unlawful or malicious supplying, or ad-

ministering to a pregnant woman, or causing or procuring to be taken by her, any drug, poison, substance or noxious thing, or unlawfully using or causing to be used any instrument or other method whatsoever, with intent to procure or cause an abortion."

The statutes on this subject recognize the right of a physician to produce an abortion in the interest of the mother. The question arises: Should this right be exercised? Without undertaking to discuss the various conditions under which the exercise of this right might be considered, the broad proposition is laid down that the occasions on which it would become imperative to sacrifice the life of the child to save that of the mother are extremely rare. With the two great resources of rectal alimentation and Cesarean section at command, it is believed that practically every pregnancy can be safely carried to a point at which the life of the child may be saved. The methods and means of maintaining nutrition by rectal alimentation have been so perfected that the production of abortion, or of premature delivery, for gravid nausea should rarely or never be required. At all events, by this resource the woman ought to be carried to the point of certain viability of the child before premature delivery is resorted to. For deformed pelvis surgery, with its tremendous advances in skill and technic, offers in Cesarean section a resource for saving the life of the child, and at the same time of jeopardizing to such a small degree that of the mother, that it should be universally employed in such cases. Dr. L. L. Hill, a surgeon of distinction in my state, and fully informed on these questions, furnished me recently the following statistics applying to Cesarean section: "1. Zweifel performed 76 Cesarean sections with 1 death. (J. Whitridge Williams, professor of obstetrics in the Johns Hopkins University, 1903.) 2. In 1903 J. Whitridge Williams collected the reports of 335 cases of Cesarean section by various operators, with a mortality of 6.87 per cent. 3. Not a single death of a mother occurred in 11 Cesarean sections recently performed at Johns Hopkins Hospital. 4. The mortality in Cesarean section should be about the same as that resulting from operations for simple ovarian tumor."

Without pursuing this discussion further, I submit to this Section the following propositions, and invite an expression of judgment thereon, not only by the individual members, but by the body:

1. The conjunction of male and female germs constitutes, from a scientific standpoint, birth.

2. The term conception should be abolished and that of birth substituted therefor.

3. In dealing with all stages of pregnancy, even the earliest, physicians should realize the extreme gravity of the condition, and should never condemn to death a fetus, however young, without the maturest consideration, and without calling to their aid the highest professional authority within reach; in a word, without carrying the case to the nearest and wisest medical supreme court accessible.

4. The principles herein contended for should be impressed on the members of the profession, taught to medical students and promulgated widely among the people.

5. Medical men should interest themselves to see that the statutes of their respective states are ample for the protection of the *fœtus in utero*.

DISCUSSION.

DR. H. O. MARCY, Boston, said that his opinions correspond with those of Dr. Sanders. He believes that the conclusions should be emphasized most positively. A physician may induce an abortion because he believes that the life of the mother is more valuable than the life of the fetus, but he should try to conserve the life of both to the best of his ability.

DR. W. H. SANDERS declared that it was not stated in the paper that abortion should never be brought about, but that it should be the result of very mature consideration and after consultation with the highest and wisest and most experienced authorities within reach.

STUDIES IN ROENTGEN RAY DIAGNOSIS OF CHEST DISEASES.

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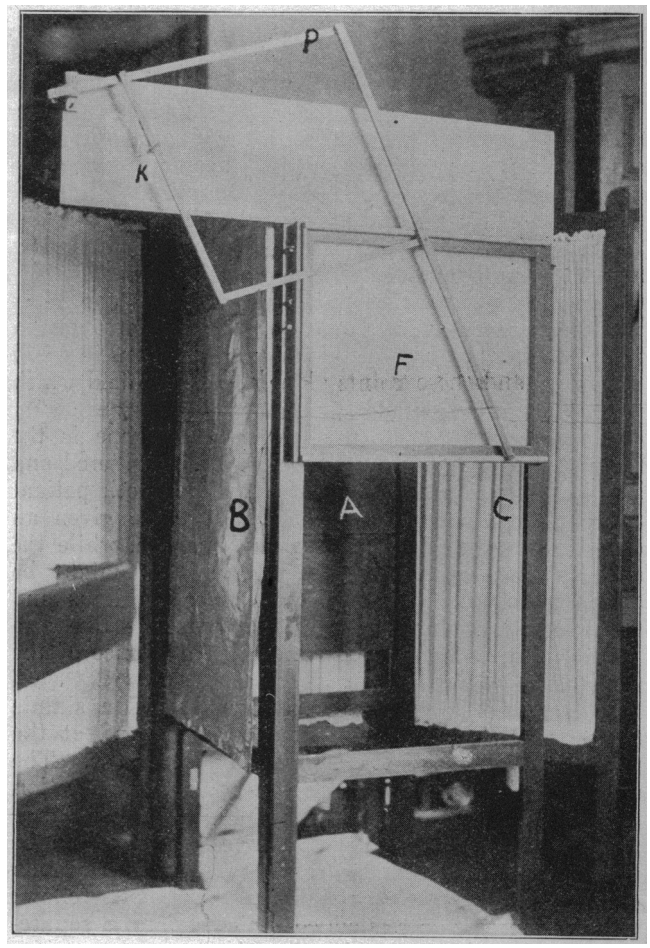
I.

The use of the Roentgen ray as an aid in the diagnosis of chest diseases has by no means received the attention that it justly merits. No doubt its neglect has been principally due to the fact that the expense is still a factor, and at the same time the danger from burns, which lately has been so grossly magnified, has deterred many who would have otherwise given their sanction, if not direct co-operation.



When the *x*-ray first came to be used, it seemed as if it was to be generally adopted for routine examinations in diseases of the chest, mainly through the use of the fluoroscope, but during the excitement many methods of examination were advised that consisted of so much detail that it served more to repel than to at-