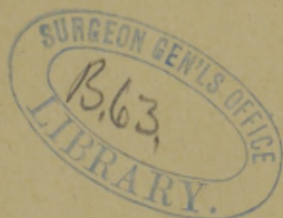


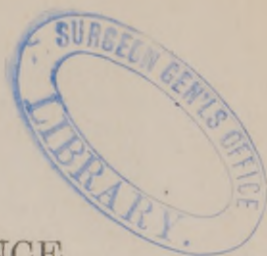
Gaston (J. B.)

MEDICO-LEGAL EVIDENCE
OF
INDEPENDENT LIFE
IN A
NEW-BORN CHILD.

BY J. B. GASTON, M. D., OF MONTGOMERY, ALA.

Compliments of
O. M. Thon





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[*Extracted from the American Journal of Medical Sciences, Jan., 1876.*]

The present status of medico-legal opinion in regard to the signs of independent life in a new-born child, is shown by the testimony of medical experts, and the judgments of courts, both American and English, in the following law cases which involved the statutory descent of large amounts of property.

The Kent County Supreme Court has been engaged all this week with a very important case. Under the laws of Delaware the property of a wife who dies without issue descends not to her husband, but to those of her own blood. Ten years ago, Henry Stout, a wealthy Dover lawyer, died, leaving his property to his three children. Five years ago, his only daughter married the Rev. H. R. Hall, of Lewes, and a year later she died in giving birth to her first child. The latter, it is claimed by the father, lived for a few minutes after being delivered, but this, Mrs. Hall's brothers denied. If the babe breathed for a single second after birth, then its mother's property descended to her husband. If it was dead when delivered, however, the mother died without issue and her property descended to her brothers. To settle the question, the brothers brought suit for the property, and the case occupied the attention of the court the entire week. For the plaintiffs Senator Saulsbury and ex-Senator Comegys appeared, and the defendant was represented by ex-Judge Layton, ex-Congressman Smithers and Edward Ridgely, Esq. The first witness called was Dr. George Goodell, who attended Mrs. Hall in her fatal sickness, and delivered her of a child. He was positive the child showed no signs of respiration or muscular motion after birth. This was all the material evidence offered by the plaintiffs at this stage of the proceedings. Dr. Page, who was also present at the delivery of the child, was called by the defense. He believed the child had a distinct existence, for with his ear upon its chest he had heard its heart beat; he also saw the temporal arteries vibrate and the umbilical cord throb.

Dr. Penrose, Professor of Obstetrics in the University of Pennsylvania, being called as an expert, said, that, from what he had heard, he felt confident of the child's independent and distinct existence. Drs. Jump and Shoemaker gave similar testimony. In rebuttal, the plaintiffs called Drs. Cahall, Ezekiel and William Cooper, who testified that the child had none other than a fetal life, and that its existence was necessarily imperfect and indistinct—of no account whatever in establishing the defendant's claim to his dead wife's property.

This closed the evidence, and the case was argued at great length by counsel. Yesterday morning arguments were concluded, and Chief Justice Gilpin delivered an elaborate charge to the jury, who were then given the case, and to-day they returned a verdict in favor of Hall, the defendant, basing it upon the supposition that the child drew at least one breath in this world, sufficient to possess Mr. H. with a fortune.—*Wilmington (Del.) Letter to the Philadelphia Times.**

NOTE.—It is strange that in this case any importance whatever should be given to the beating of the heart or of any artery, unless the cord had been severed. The true view to be adopted in all such cases has long since been settled by the English Courts. It was furnished in the following case—E. S. G.*

LEGAL EVIDENCE OF LIFE IN AN INFANT.—A case of great interest in medical jurisprudence (case of Brock versus Kellock), has recently been decided by the Vice Chancellor, Sir J. Stuart. The point at issue was to determine the legal evidence of life in an infant. Dr. Robert Lee and Dr. F. H. Ramsbotham contended that the proof of respiration having been performed was necessary to establish the fact of extra-uterine life. Dr. Tyler Smith, Dr. Freeman and Dr. Alfred Taylor deposed that the continuance of the heart's action after severing of the umbilical cord must be accepted as proof of independent life. The Vice Chancellor, in his decision, confirmed Dr. Tyler Smith's view of the case, and expressed his surprise that a man of Dr. Lee's position should have made such an affidavit. There was a large pecuniary amount involved in the decision. The case is of great importance, as it will serve to establish the law, which has been much unsettled upon the point at issue.—*Richmond and Louisville Medical Journal.*

From the foregoing cases it appears that both English and American courts agree that the beating of the heart of a newborn child, after the severance of the umbilical cord, is conclusive of the independent extra-uterine life of the child. This judgment of the courts depends upon the testimony of medical experts, and it is therefore clearly within the province of medical criticism to inquire whether the decision is or is not consistent with a just interpretation of the phenomena of organic and animal life.

*This extract and note (not in original publication) and extract following, appeared in the *American Medical Weekly*, July, 1875.

Of the great functions of organic life, respiration and circulation appear to be the conditions most unremittingly essential to the life of the the higher orders of animals. Respiration, which, in general terms, is the evolution of carbonic acid from the fluids of organized beings and the absorption of oxygen from the surrounding medium, exists alike in the vegetable and animal kingdoms. All plants and all animals perform essentially the same respiratory function. It is an essential of organic life. (See Carpenter's *Compar. Phys.*, pp. 253, 298.) Circulation, on the contrary, is not an essential of organic life. The simplest organisms, both animal and vegetable, have no circulation whatever. Every part of their surface being equally capable of absorbing liquid nutriment, there is no necessity for a circulation.

Medical gentlemen, in testifying that the beating of the heart after the severance of the umbilical cord is conclusive of the independent extra-uterine life of the child, have undervalued that function, respiration, which is always and everywhere essential to organic life, and have given undue importance to a function which is not an essential of organic life, and which is found only amongst plants and animals of a somewhat complex differentiation of organs. That heart-beat is an essential of extra-uterine human life, of course no one will deny; but I do deny that it is *the essential* upon the presence of which can be predicated independent extra-uterine life.

High medical authorities—Drs. Penrose, Page, and others of this country, and Drs. Tyler Smith, Freeman, and Alfred Taylor of England—testify “that the continuance of the heart’s action after severing of the umbilical cord must be accepted as proof of independent life.” The fact is, however, that intra-uterine life, so far as heart-beat is concerned, is just as independent of the mother as extra-uterine life. The foetus is dependent upon its mother not for heart-beat and circulation, but for oxygen and nutrient materials. There is no direct communication betwixt the vascular systems of the foetus and the mother. The relation of the placental ramifications of the umbilical vessels and blood of the foetus to the

mother's blood is analogous in many respects to that which exists between the branchial vessels and blood of fishes and the water, which, in obedience to respiratory movements, flows between the gil-fringes, somewhat as the blood in the utero-placental sinuses flows around and between the foetal villi of the placenta ; and the circulation of the foetus is just as independent of the mother as the circulation of the fish is of the water in which it lives, and from which it obtains its oxygen and food. The foetal heart-beat and circulation, as such, are, therefore, as independent as the adult heart-beat and circulation. Not so with respiration. For the performance of this function the foetus is entirely dependent upon its relations with its mother. Of the great organic functions, the suspension of any one of which would place life in immediate and imminent danger, none is so differentially characteristic of foetal life as placental respiration. Destroy it, and intra-uterine life must end. What placental respiration is to the foetus, pulmonary respiration is to the infant. When the former ceases, an essential of intra-uterine life ends. When the latter is established, a *sine qua non* of extra-uterine life has been supplied. Heart-beat and respiration are such absolute essentials of advanced foetal and extra-uterine life, and death follows so suddenly and surely the destruction of either of these functions, that I conceive the true doctrine to be that no child can be known to be alive in which either circulation or respiration has been destroyed ; and consequently, since birth involves the speedy destruction of placental respiration, that independent extra-uterine life cannot be affirmed of an infant which has not breathed. Heart-beat is essential to both intra-uterine and extra-uterine life, but it is not characteristic of either. So it is with respiration ; but placental respiration is characteristic of intra-uterine life, and pulmonary respiration is characteristic of extra-uterine life. At birth no sign can be conclusive of independent extra-uterine life which is not characteristic of extra-uterine life. Does division of the cord give to heart-beat a characteristic and independent feature which it did not possess before ? I think not. If from a railroad train in rapid motion the engine should be

detached, would not the brief, continued motion of the train be entirely dependent upon its recent relations to the engine? Division of the cord cuts off, so far as the mother is concerned, a further supply of conditions of life; but it does not give independence of life. I hold that the phenomena observed in the children mentioned in the Delaware and English law cases, if they were, and so far as they were signs of life, were in the same measure dependent upon recent relations to the mothers, as were similar signs before division of the cords.

In the children above mentioned, and in all like cases, there is good reason to believe that the heart's action should not be relied upon as a strictly test sign of animal life. The first of the permanent organs of the embryo to display functional activity, the heart pulsates while its walls are still in a cellular condition, before the formation of its own muscular tissue, or the development of nerve-tissue either in its own substance or in the body at large. It beats through life so constantly, and so regularly, that we can almost "count time by heart-throbs;" and physiologists, however they may differ as to the theory, agree as to the fact that it may continue to beat after death. Nay more, Mr. Todd has shown, contrary to what might be expected, that this power of rhythmical contraction after death is especially persistent in every young animals. The independence of the heart's action has been demonstrated by numerous experiments. In some cold-blooded animals it will continue to beat for many hours after its removal from the body. This is easily demonstrated with the hearts of the frog and the turtle; and Dr. Mitchell (*Amer. Journ.*, vol. vii. p. 58) states that the heart of a sturgeon, which had been removed from the body, continued its rhythmical movements until the auricle had become so dry that a rustling sound was heard with each contraction.

The life of a new-born child rests very largely upon the action of the heart. It is probably the most constantly essential of the "props" of the "tripod of life." The *independence* of extra-uterine life rests, however, neither upon the beating of the heart, nor upon the division of the cord, nor upon both of them together, but upon the substitution of the extra-uterine

conditions of a great organic function constantly essential to life, for the foetal conditions of the same function which have been, or are about to be destroyed. Pulmonary respiration substitutes real, tangible conditions of independence for those of dependence; and until it is established there can be no "independent life."

We have seen that heart-beat, although essential to, is not characteristic of extra-uterine life, and, consequently, does not attach to it any feature or condition of independence which did not belong to foetal life; that division of the umbilical cord may destroy conditions of foetal life, but that it is not, in any sense, a factor, sign, or condition of independent extra-uterine life; and finally, that beating of the heart, of itself, will not do for a test sign of life in the animal to which it belongs. It, therefore, appears that the phenomenon, "continuance of the heart's action after severing of the umbilical cord," to which, in the afore-mentioned cases, medical experts and courts have attached so much importance, was not evidence of "independent life," but was probably simply the last flickering of an extinct foetal life.

What is false in science, cannot be a fact in law; and although legislative bodies may yet declare the presence of circulation and pulmonary respiration, in some extreme cases, such as deliveries at non-viable ages, too narrow a base upon which to establish the civil rights of infants, I feel assured that, before long, the courts must hold that less than this is not, in any case, sufficiently broad. All our knowledge of life is purely phenomenal. Of what life is in itself, that is apart from its manifestations, we philosophically know nothing. It is, therefore, in the present state of science, impossible to draw the line and mark accurately where dependence ceases and independence begins. I have endeavored, consequently, simply to establish a practical distinction based upon some of the differential phenomena of foetal and extra-uterine life.

