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PROBATIONARY ESSAY  
ON THE  
VIABILITY OF THE FŒTUS

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PROBATIONAL ESSAY

BY

LABRIETY OF THE FORTS

A

PROBATIONARY ESSAY

ON THE

VIABILITY OF THE FŒTUS;

SUBMITTED,

BY AUTHORITY OF THE PRESIDENT AND HIS COUNCIL,

TO THE EXAMINATION OF THE

**Royal College of Surgeons of Edinburgh,**

WHEN CANDIDATE FOR ADMISSION INTO THEIR BODY,

IN CONFORMITY TO THEIR REGULATIONS RESPECTING THE

ADMISSION OF ORDINARY FELLOWS.

BY

**ALEXANDER D. CAMPBELL,**

BACHELOR OF ARTS OF TRINITY COLLEGE, DUBLIN; BACHELOR OF ARTS AND OF  
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AND MEMBER OF THE PARISIAN MEDICAL SOCIETY.

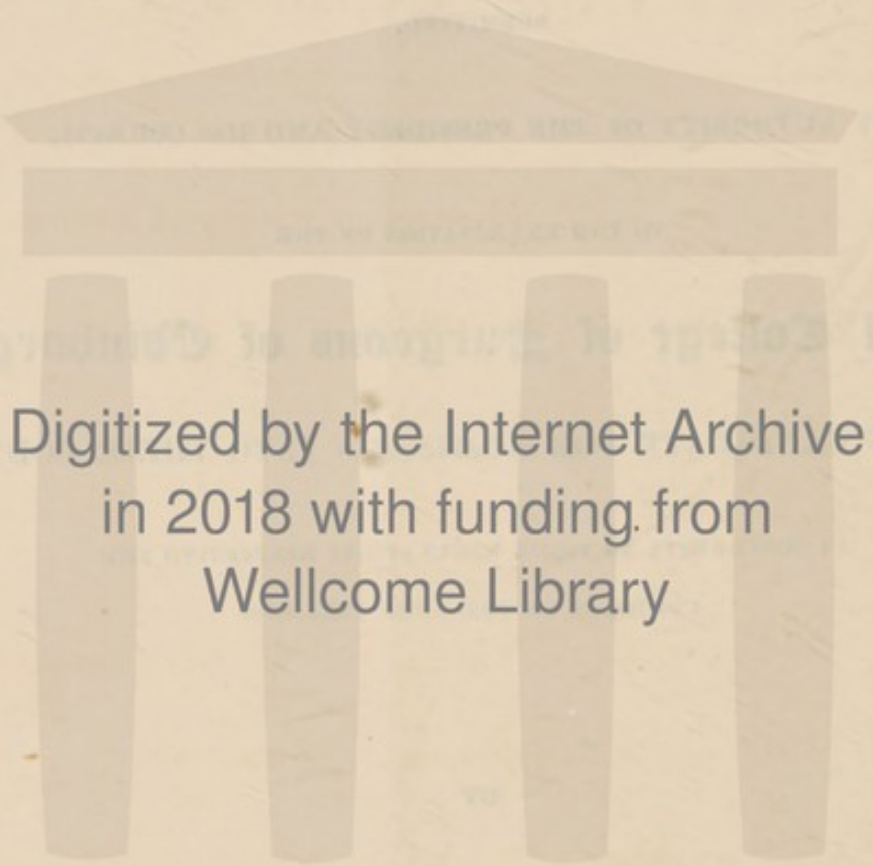
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PROBATIONARY ESSAY  
ON THE  
VIABILITY OF THE FETUS;



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TO

JOHN KIDD, M.D.,

FELLOW OF THE ROYAL SOCIETY OF LONDON; REGIUS PROFESSOR OF MEDICINE  
IN THE UNIVERSITY OF OXFORD;

AS A SMALL TESTIMONY OF PERSONAL ESTEEM

FOR HIS EMINENT VIRTUES;

HIS PROFOUND LITERARY ACQUIREMENTS;

HIS EXERTIONS AND EXAMPLE IN THE CULTIVATION OF  
MEDICAL SCIENCE;

THE FOLLOWING PAGES ARE DEDICATED,

WITH THE GREATEST RESPECT,

BY HIS MOST OBEDIENT SERVANT,

THE AUTHOR.



JOHN RYAN M.D.

LECTURE ON THE NATURE OF THE NERVOUS SYSTEM

IN THE COURSE OF A COURSE

IN A FULL COURSE OF MEDICAL STUDY

IN THE COURSE OF A COURSE

IN THE COURSE OF A COURSE

IN THE COURSE OF A COURSE

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IN THE COURSE OF A COURSE

THE AUTHOR

TO

FRANCIS CHARLES NÆGELE, M.D.,

PRIVY COUNSELLOR TO THE GRAND DUKE OF BADEN;  
KNIGHT COMMANDER OF THE ORDER OF THE ZAHRINGIAN LION AND OF THE  
ROYAL DANISH ORDER OF DANNEBROCH;  
PROFESSOR OF MIDWIFERY AT HEIDELBERG;  
MEMBER OF THE IMPERIAL ACADEMY OF MOSCOW, AND OF THE ROYAL SOCIETIES  
OF WILNA, BERLIN, BONN, BRUSSELS, HEIDELBERG, LEIPSIC, LONDON,  
PHILADELPHIA, VIENNA, LYONS, MARSEILLES, MADRID, ETC.

WHOSE POWERS OF OBSERVATION,

SUPERIOR JUDGMENT,

AND ZEAL IN THE SCIENCE AND PRACTICE OF MIDWIFERY,

HAVE RAISED HIM TO THE FIRST RANK OF OBSTETRIC EMINENCE

IN HIS OWN COUNTRY,

AND GAINED HIM THE UNIVERSAL ESTEEM OF

HIS BRETHREN ABROAD,

THIS ESSAY IS DEDICATED,

AS A MARK OF RESPECT,

BY HIS MUCH OBLIGED AND OBEDIENT SERVANT,

THE AUTHOR.



FRANCIS CHARLES WAGGLES, M.D.

THESE THINGS BEING TO THE GREAT DEGREE OF WHICH  
THEY ARE CAPABLE OF THE HIGHEST AND BEST OF THE  
NATURE OF THE HUMAN MIND IN GENERAL;  
AND BEING OF SUCH A NATURE AS TO BE  
OF THE GREATEST IMPORTANCE TO THE  
WORLD IN GENERAL, AND TO THE  
INDIVIDUALS OF EACH NATION IN  
PARTICULAR.

WHICH POWER OF OBSERVATION

SUPREMACY OF REASON

AND BEING IN THE MINDS AND CHARACTERS OF ALL

TO BE TAUGHT HIM TO THE BEST OF HIS ABILITY

TO HIS OWN COUNTRY

AND GIVING HIM THE MOST PERFECT KNOWLEDGE

OF HIS DUTY AS A MAN

THIS ESSAY IS DEDICATED

AS A MARK OF RESPECT

BY HIS MOST OBLIGED AND AFFECTIONATE

THE AUTHOR

A

# PROBATIONARY ESSAY

ON THE

## VIABILITY OF THE FŒTUS.

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THE history of this subject possesses but little interest until about the 17th century, when legal medicine first began, as a distinct branch of the profession, to engage the attention of individual writers, and of universities. Nearly 400 years before Christ, the father of medicine declared that of seven months' children "*περιγινοῦνται ἐκ πολλῶν ὀλίγα;*"<sup>1</sup> and regarding those of a later period, "*οκταμηνων ουδεν περιγινηται.*"<sup>2</sup> These dogmas were acquiesced in by GALEN, who, moreover informs us, that he knew a woman who had brought forth on the 184th day. Whether the child lived or not he does not mention; we may presume however, that it did, as the simple fact of a fœtus having been born at that period of pregnancy would not be worth noting.<sup>3</sup> HIPPOCRATES followed in some

<sup>1</sup> *Ἱπποκράτους περὶ Ἑπταμηνων.*

<sup>2</sup> *Op. cit. περὶ οκταμηνων.*

<sup>3</sup> *Γαληνου περὶ Ἑπταμηνων βρεφων.*



measure the doctrines of the Pythagoreans, as VALLESIIUS terms them, "Philosophi inter stellas errantes;" and the only reason why a child of eight months' utero-gestation could not survive was, "propter numerorum naturas." It is well known with what obstinacy the dicta of HIPPOCRATES were adhered to for more than 1500 years, and that medical men almost preferred their patients to die according to his rules, rather than recover in opposition to them.<sup>4</sup> The earliest writer who advances a contrary opinion to HIPPOCRATES on this question, is SPERO SPERONE a Venetian, who wrote dialogues on different subjects connected with females, and among others one entitled, "Del tempo del partorire delle donne," dated 1543. After him we have MARCELLUS DONATUS, who states that a case was presented to him for decision in 1578, but he cautiously gives no opinion regarding it, although he seems rather inclined to agree with HIPPOCRATES. The next writer of importance on this subject is ALPHONZO CARANZA, a Spaniard, in a work entitled "de Partu legitimo et naturali;" he views the question more as a lawyer than as a medical man, and believes in the possibility of a child of five months' gestation being reared. PAOLO

<sup>4</sup> "Ce n'est pas que son avis, comme on a vu n'ait tué le malade, et que celui de Theophraste ne fut beaucoup meilleur assurément; mais en fin il a tort dans les circonstances, et il ne devoit pas être d'un autre avis que son ancien." Such was the feeling of the times thus ridiculed by Molière.



ZACCHIA called by pre-eminence the "great Roman medical jurist," is the next author who treats the subject at any length; he discards the theories of HIPPOCRATES on the natures of numbers, and says, that seven months' children rarely live, six months' never. His writings were deservedly held in high esteem, in an age, when neither chemistry nor physiology were sufficiently advanced to aid the medical jurist in his researches; he is blamed by some (and not without reason) for excessive credulity.<sup>1</sup>

From the time of ZACCHIA to that of CHAUSIER, the subject of viability, though not specially treated has been casually alluded to by the following authors on medical jurisprudence and on midwifery: MONTUUS,<sup>2</sup> CARDANUS,<sup>3</sup> MENA,<sup>4</sup> VALLESIIUS,<sup>5</sup> HEBENSTREIT,<sup>6</sup> SICKORA,<sup>7</sup> AMMANUS,<sup>8</sup> ZITTMAN,<sup>9</sup>

<sup>1</sup> As a specimen of his credulity, he states his belief in conception taking place in the higher classes of animals, "*sine mare*," which idea he maintains by adducing the steed of Raimond and those of Achilles: we have only to regret that Brian the hermit was unknown in the days of Zacchias, as with the support of three such unimpeachable authorities in the marvellous, as Tasso, Homer, and Scott, the fact would have been quite unassailable.

<sup>2</sup> Anasc. Morbor. lib. iv. cap. 41, a case in fifth month.

<sup>3</sup> Contradict, viii. tract iii. lib. i. contains three cases in the fifth month.

<sup>4</sup> Comment. ad cap. iv. de sept. part. Hipp. one case of fifth month.

<sup>5</sup> De Philosoph. Sacra, cap. 18, one case of fifth month.

<sup>6</sup> Med. For. sect. ii. cap. ii. p. 199.

<sup>7</sup> Conspect. Med. Leg. sect. iii. and iv.

<sup>8</sup> Med. Crit. cas. 68. one case in sixth month.

<sup>9</sup> Cent. vi. cas. 38.



VALENTINI,<sup>1</sup> TEICHMEYER, MAURICEAU,<sup>2</sup> LA  
MOTTE,<sup>3</sup> VAN SWIETEN,<sup>4</sup> LUDWIG,<sup>5</sup> PLENK,<sup>6</sup>  
METZGER,<sup>7</sup> WILLIAM HUNTER,<sup>8</sup> FODERE,<sup>9</sup> BELLOC,<sup>10</sup>  
DEVERGIE,<sup>11</sup> BAUDELOCQUE,<sup>12</sup> CAPURON,<sup>13</sup> TORTOSA,<sup>14</sup>

<sup>1</sup> Pandect Med. Leg. part i. sect. i. p. 144.

<sup>2</sup> Liv. ii. p. 205. Les enfans qui naissent effectivement à sept mois, sont si petits et si foibles, que je n'ai jamais vu un seul vivre plus de quinze jours.

<sup>3</sup> Cap. xxvii. p. 116. "J'appelle un enfant être né à terme quand il est en état de conserver la vie. J'appelle l'enfant être a terme depuis le commencement du settième mois." A case is mentioned where a woman and her daughters always bore seven months' children.

<sup>4</sup> Comment. tom. iv. p. 516.

<sup>5</sup> Instit. Med. For. de part. legit, part ii. cap. ii.

<sup>6</sup> Element. Med. et Chirurg. For. p. 37.

<sup>7</sup> System. Med. For., sect. iii. cap. ii.

<sup>8</sup> HARGRAVE'S Note, 190 on sect. 188 of Coke on Littleton, "We see no children born with powers of coming to manhood, or of being reared before seven calendar months. At six months it cannot be."

<sup>9</sup> Médecine Légale, p. 308. Parmi les enfans qui naissent a cet epoque (settième mois) la plupart ne tardent pas a mourir ensuite.

<sup>10</sup> Médecine Légale, pp. 77, 78, contains two cases of six months.

<sup>11</sup> Médecine Légale, art. Viabilité, p. 704. Les enfans de sept mois sont dans des conditions peu favorables a la viabilité.

<sup>12</sup> Art des Accouch., p. 519. L'Avortement est l'expulsion du fœtus, avant qu'il ne soit assez fort, et assez developpé, pour continuer de vivre apres sa naissance, quelques soins qu'on donne a sa conservation. Tout accouchement qui se fait avant le septieme mois de la grossesse, est un avortement.

<sup>13</sup> Médecine Légale, p. 157. . . . il est vrai qu'il ne peut jamais y avoir de viabilité pour le fœtus avant la fin du cinquième mois de grossesse, p. 158, depuis la fin du cinquième jusqu'a la fin du settième, les enfans ne sont guère plus viables.

<sup>14</sup> Istituzioni di Med. For., vol. ii. p. 100. Un Germe, le di cui parti componenti godano di una facillissima propensione allo svogliersi, potra col favore di ottime circostanze giugnere con straordinaria prestezza ad un grado di sufficiente sviluppo, acquistare una anticipata maturità, e prevenire l'ordinario termine al parto, nascend non pur ostante vitale. Ecco l'origine dei parti che diconsi prema-



GARDIEN,<sup>1</sup> CHAUSSIER,<sup>2</sup> and since this latter writer, by ORFILA,<sup>3</sup> HENKE,<sup>4</sup> CARUS,<sup>5</sup> NÆGELE,<sup>6</sup> HAMILTON,<sup>7</sup> and MONTGOMERY.<sup>8</sup> A few non-medical authors have treated the subject with attention. JULIUS PAOLUS,<sup>9</sup> ULPIAN, and MATTHÆUS CURTIUS,<sup>10</sup> and CUJACCIUS. A number of the foregoing authors have advanced no opinion of their own,

turi, cive de quelli che nascono a sufficienza compiuti al principio del nono mese, nell'ottavo, e durante il corso del settimo.

<sup>1</sup> *Traité d'accouchments*, vol. i. p. 461. On ne peut donc rien fixer de certain sur le terme de la grossesse, où commence la viabilité.

<sup>2</sup> *Memoire sur la Viabilité*, p. 30. Est reconnu et réputé viable, l'enfant dont la tête est bien conformée, qui, au plus tôt trente six heures après sa naissance, est présenté vivant et vigoureux.

<sup>3</sup> *Leçons de Med. Leg.*, tom. i. p. 371. Il est rare de voir vivre, ceux qui n'ont pas sept mois accomplis; la plupart d'entre eux perissent au bout de quelques jours.

<sup>4</sup> *Lehrbuch der Gericht Med.*, sect. lxxxvii. Jede vor Ablauf des Siebenten Monats nach der Empfängniss geborne Frucht, ist, wenn sie auch lebend zur Welt kommt, und mehrere Stunden selbst Tage fortlebt, dennoch zum fortgesetzten Leben unfähig, also für nicht lebensfähig zu erklären.

<sup>5</sup> *Gynækologie*, sect. 710, s. 42. Kinder im sechsten Monate geboren leben zuweilen allerdings eine Reihe von mehrern Stunden können aber nicht fortleben. Op. cit. sect. 711, s. 43. das Kind im siebenten Monate geboren. . . . kann schwerlich je erhalten werden.

<sup>6</sup> *Lehrbuch der Geburtshülfe*, sect. ccxlii. s. 107. ein Kind vor Ablauf der sechs und zwanzigsten Woche geboren, nicht ausgebildet und stark genugist, sein Leben ausser den Schoose der Mutter fortsetzen zu können.

<sup>7</sup> *Gardner Peerage Trial by Lyall*, introduct. p. 28. "All accounts of children living to maturity who were brought forth at the fifth or sixth month are fabulous."

<sup>8</sup> *Signs of Pregnancy*, pp. 261, 262.

<sup>9</sup> PAOLUS de suis et legitimis hæredibus.

<sup>10</sup> MATTHÆUS CURTIUS de septimestri Partu, p. 342.



but merely stated what their predecessors had seen or said.

The importance of the question of viability, as evinced by a recent trial in the ecclesiastical courts of this country, afford sufficient reason for choosing it as the subject of the following pages. Besides (as in the case above alluded to,) the fair fame of the parents being called in question, by a viable child being born within six months after marriage, the subject may be brought before a jury under the following circumstances; first, as regards the right or title which a child possesses to succession, or the inheritance of property; and, secondly, as regards a husband's claim to his wife's property as his child's heir, or, as he is technically termed, "a tenant by curtesy." The former of these, affects of course only living children, and could not be brought before a court in England, as, according to English law, a child is viable simply by being alive: The latter has been before the courts.<sup>1</sup> Again, a child might be born, and live some time, affected with disease or malformation, from which it could not possibly recover; against such a circumstance English law makes no provision; but by the French code it would not be considered viable.

The term viability has given rise to some discus-

<sup>1</sup> BECK'S Med. Jurisprudence, p. 193.



sion, and considerable misunderstanding, with regard to its proper acceptation, some deriving it from *via*, a way, and *habilis*, fit, others from *vita* and *habilis*; that the former is incorrect may be easily perceived, from the doctrine which a teacher of midwifery in London used yearly to inculcate to his class, viz., that a child of four months' utero-gestation, was *more viable* than one of nine, *i.e.* it could pass with greater facility through the pelvis. There can be no doubt, therefore, that the latter of the two derivations is the proper one, and the more correct word would probably be *vitability*; there is, however, another way of explaining the term, still keeping the first derivation in sight, viz. that the foetus is fit to continue its course of life.<sup>1</sup> The term (*lebensfähigkeit*,) used by the German writers on the subject, is perhaps more correct and expressive than our own; that of the Italian authors (*vitalità*,) means nothing more than mere existence.

The derivation of the term, however, is of little consequence, provided the definition applied be correct, and that which I shall keep in view throughout this essay is, that viability means the apparent capability of sustaining life to the usual average of human existence. This definition is not legally correct, as in some countries a child, born before the

<sup>1</sup> Granting the term *viability* to be merely "*viabilité*" Anglicised, its composition is *vie* and *habile*, in other words, *vita* *habilis*.



commencement of the seventh month, is not in law viable, though it lived to the age of fifty years, *i.e.*, it can succeed to no property, and interferes with no inheritance, and is looked upon as an abortion only, a "*partus vivus non vitalis*." It is therefore necessary to state, that throughout the following pages I shall adhere solely to the definition above given, except where legal viability is specially mentioned.

It is, however, denied by Devergie that there are two kinds of viability, one natural and the other legal; he says, "la viabilité est une, c'est l'aptitude à vivre en dehors du sein de la mère et indépendamment d'elle." Chaussier, however, tells us, "est réputé non viable l'enfant qui naît avant le trois derniers mois de la grossesse;" in short, in all these legal definitions, the term legitimate should be substituted for viable.<sup>1</sup>

In some cases, a legally fixed period of viability might be of use in saving to the disputing parties protracted litigation, trouble, and vexation. Whether a precise period might be fixed, I shall endeavour to show, after reviewing the recorded cases of early viability, upon which the various authors on the sub-

<sup>1</sup> TOULLIER, Cours de Droit Civil, art. 312. Ce n'est donc qu'à six mois que la loi reconnaît l'enfant viable quoique les gens de l'art prétendent qu'il est viable à cinq mois aux yeux de la médecine. PLENK, Element Med. For. p. 37. Fœtus ante initium septimi mensis solaris natus, sensu juridico vocatur non vitalis etsi vivus nascatur.



ject have founded their opinions for or against the question. All that the Roman law required for the viability of a child was, that it should be perfectly alive, “*si vivus perfecte natus est, etsi vocem non emisit.*”<sup>1</sup> An early French law required, “that in order to succeed to property, the child should live an hour, and be able to see the four walls and ceiling of the chamber.”<sup>2</sup> An ordinance of Louis IX. directed that it should cry in order to enable it to succeed.<sup>3</sup> The present French law does not state what constitutes viability, but, according to Capuron, “*les juris consultes ont adopté l’opinion des médecins à cet égard, et ne font consister la vie que dans la respiration complète. Le célèbre Merlin dit aussi très formellement qu’ il n’y a que la respiration complète que constitue la vie.*” It, however, requires, as already mentioned, that the child be of 180 days’ utero-gestation. According to the law of some German states, all children before the twenty-sixth week, are looked upon as abortions.<sup>4</sup> It was stated

<sup>1</sup> CHAUSSIER sur la Viabilité, p. 3.

<sup>2</sup> A Capitulary of DAGOBERT, A.D. 630. *Si . . . . infans vivus remanserit aliquanto spatio, vel unius horæ, ut possit aperire oculos et videre culmen domus et quatuor parietes et postea defunctus fuerit.*

<sup>3</sup> CHAUSSIER, *op. cit.* p. 12.

<sup>4</sup> Unzeitige Geburt, oder Fehl Geburt, auch Missfall, Umschlag, Abortus, wird jede Geburt genannt, die in den ersten sechs Monaten der Schwangerschaft, oder vor Ablauf der sechs und Zwanzigsten Woche erfolgt. NÆGELE Lehrbuch der Geburtshülfe für Hebammen, § 242, s. 106.



by Professor Casper of Berlin, in his oral lectures, that, according to Prussian law, no child is legally viable if born before 210 days. In Italian law there is no fixed period,—all that is necessary for succession or acquisition of property is, that the child be natural and legitimate.<sup>1</sup> The ancient Spanish law of Queen Joanna's time, simply required the child to live twenty-four hours and be baptised.<sup>2</sup> This law was afterwards altered by Alphonso the Tenth, (the Castilian Solon,) so that a child of seven months was to be reckoned viable and legitimate.<sup>3</sup> In England, a child *born alive* is legally viable, at whatever period of utero-gestation, so that if a woman produced an abortion in the fourth month, which could be seen to move for a few minutes after birth, her husband would by this child be constituted a tenant by the curtesy of England.

The Scotch law is a little more explicit, as the child must be heard to cry, which is the best sign of pre-

<sup>1</sup> L'uomo appena nato, entra in possesso di alcuni diritti civili, i quali per altro, dai Guirisprudenti, non si concedono, che ai parte naturali e legittimi. Istituzioni di Med. For. GUISEPPE TORTOSA, vol. ii. p. 98. "Naturali" is afterwards explained thus, "che non sia mostruozo."

<sup>2</sup> Ordenamos i mandamos, que tal hijo se diga, que naturalmente es nascido, i que no es abortivo, quando nascio vivo todo, i que almenos despues de nascido, vivio veinte i quatro horas naturales, i fue baptizado, antes que muriesse. ALPHONSO CARANZA de Partu Legit. et Natural, p. 724. Tauri Scholia ad legem, viii. quæ est, l. 2. tit. 8, lib. Recopilat.

<sup>3</sup> CARANZA, op. cit. p. 729. Scholia ad legem, iv. tit. 23, partit. 4.



sent life, but by no means testifying that its organization is in a fit condition to enable it to continue in being. With regard to the law of England, COKE observes, "If it be born alive it is sufficient, though it be not heard to cry, for, peradventure, it may be born dumb;"<sup>1</sup> this may be well answered by a quotation from PROFESSOR DUNGLISON, "It need scarcely be said, that the deaf and dumb cry at the moment of birth. The natural cry is effected by them, as well as by the infant that possesses all its senses, it is the acquired voice alone, which they are incapable of attaining."<sup>2</sup>

The case of earliest viability on record, appears to be that of Fortunio Liceti quoted by CAPURON from some author whom he does not mention, simply stating that there was such a person, that he was born after a gestation of four months and a half, and that he lived to the age of eighty.<sup>3</sup> By other writers he is said to have been the size of a person's hand, and to have been matured, (like the pullets in Egypt,) by being carefully wrapped up and laid upon a stove. On such a case no valid opinion can be founded: it bears the stain of improbability, without a single redeeming trait. The next in point of prematurity is the instance related by Dr ROD-

<sup>1</sup> COKE on Littleton, 30 a.

<sup>2</sup> DUNGLISON's Physiology, vol. i. p. 317.

<sup>3</sup> CAPURON, Cours de Méd. Lég., p. 157.



MAN of Paisley.<sup>1</sup> It is surprising that Dr RODMAN, aware as he was of "the danger of being accounted credulous," should have omitted almost every circumstance calculated to support the view he took of the case. He begins by stating, "that the mother is more cautious in her decisions, accurate in her observations, and steady in her deportment, than what is usually met with in society, while the appearances of the infant, were sufficient proofs, to any one experienced in the practice of midwifery." As to the first part of this sentence, it is of no value, as women who have borne large families frequently err in their calculations; and as to the second part, it is only to be regretted that Dr RODMAN has not furnished us with those "sufficient proofs," the only two which he gives us, and which could with any thing like certainty confirm the supposed age of the child, being against him, and the others being common, alike, to children of the fourth month, of the sixth, and perhaps even of the seventh. The first peculiarity mentioned in this case is, that the child's "vital energy was so deficient, that, though surrounded with fine cotton-wool pressed to appear like cloth, to the thickness of three or four folds, and over that flannel, he was unable to support the degree of warmth necessary to his existence. Secondly, it was extremely difficult to get the child to swallow nourishment dur-

<sup>1</sup> Edinburgh Med. and Surg. Journal, vol. xi. p. 455.



ing the first week." Both of these would apply equally to children in the sixth, or early in the seventh month. Thirdly, twenty-one weeks and two days from the supposed date of conception, the child's exertions in sucking were sensibly felt. No one can positively assert that it would be impossible for a child at that age to suck effectually, but it is certainly far from probable. And, lastly, the length of the child three weeks after birth was thirteen inches, and its weight, clothes included, two pounds and a half avoirdupois; that of the clothes was afterwards found to be eleven ounces. In the volume of the Edin. Med. and Surg. Journal, succeeding that in which Dr RODMAN'S case was related, remarks were published on it in the following terms:—"Dr RODMAN informs us, that at three weeks after its birth, the child measured thirteen inches, and weighed one pound thirteen ounces avoirdupois. Now, it must be supposed, that during the first three weeks after its birth, the child could not have increased much either in length or weight, for 'it was extremely difficult to get it to swallow nourishment the first week;' 'the yellow gum soon came on;' 'the thrush seized him by the eighth day,' and was not cured till the end of the third week. We may therefore fairly infer, that the child, at this period, could not be so large, as if it had passed those three weeks in the womb. It remains then to be inquired, what ought to be the size



and weight of a fœtus at twenty-one or twenty-two weeks after conception?<sup>1</sup> In Dr GRANVILLE'S recent work on Abortion, we find that "the fœtus weighs one ounce and a half at three months, and measures three inches; between which, and the sixth month, it increases in dimensions from three, to six, or nine inches, and in weight from one ounce and a half, to a pound." Dr GRANVILLE states these to be averages of minute and accurate observations, made by AUTENRIETH, SÆMMERING, BICHAT, PÖCKELS, and CARUS, and confirmed by his own observations.<sup>2</sup> CAPURON, ORFILA, RAMSBOTHAM, MAYGRIER, HAMILTON, VELPEAU, GARDIEN, and BURNS, vary the weight of a fœtus at five months, from four to eight ounces, and the length from five to eight inches. In this case by Dr RODMAN, therefore, the child of nineteen weeks weighed more than three times the average weight of five months' children, and measured nearly twice the length. After what I have said, I think it unnecessary to consider this case farther, and come to the conclusion that the child was premature, but of more than nineteen weeks' gestation. Every one must regret, that an intelligent physician like Dr RODMAN, should, in his desire "to narrate the facts with simplicity," have entirely neglected any attempt to sustain his views by detailing the reasons

<sup>1</sup> Edinburgh Med. and Surg. Journal, vol. xii. p. 126.

<sup>2</sup> GRANVILLE ON Abortion, p. 11.



on which they were founded, and contented himself with simply stating, that “the appearances of the infant were sufficient proofs to any one experienced in midwifery.” The opinion given on this case by PROFESSOR CHRISTISON is worthy of remark, being formed on the consideration of matter of fact, and recorded evidence, and not on a point of obstetrical experience. He says, “this child must have been older than nineteen weeks, and in fact its weight and length correspond with the data of various authors, in describing children who lived a few hours or days, when born about the close of the sixth month, or a little later.” This opinion is corroborated by PROFESSOR HAMILTON, and particularly by Dr CAMPBELL, on the same trial.<sup>1</sup> It is stated by MELI, that PROFESSOR GIACOMO BARZELOTTI saw born of the same mother, a child of four months’ utero-gestation, living and vigorous, and a child of six months, also living and vigorous, but which died at the end of four hours.<sup>2</sup> The next mention of a five months’ child which I find, is as follows:—“Et nobis Hispanis, quinquemestrium in hac Mantua Carpetana, et in oppido de Guadaloupe editorum testes sunt FERDINANDUS MENA, et PERAM, qui simul cum VALLESIO, illustrissimæ foeminæ, editionem naturalem, et mi-

<sup>1</sup> Case against Rev. F. Jardine, pp. 144, 145, 150.

<sup>2</sup> Annales d’ Hygiène Publique, vol. viii. p. 469.



randam, in initio mensis quinti a conceptu contingentem enarrant.”<sup>1</sup> The next from an Italian writer, “conosco una giovane, che ottiene i primi onore sulle belle del Tevere, e che certamente può dirsi uno dei piu belli tomi della Biblioteca Romana, e so che per la sua rara edizione furono soli cinque mesi impiegati.”<sup>2</sup> A case of five months is mentioned by MELI, as having been under the care of CELONI, and which died thirty hours after birth; whether the one mentioned above or not, it is impossible to say. Another, a five months’ child, is said, by the same author, to have been under the care of a physician named MOLINA, near Como.<sup>3</sup> The instance of Marshall Richelieu is treated by CAPURON in the same unsatisfactory manner as that of FORTUNIO LICETI. The case of the former is said to have been brought before the “Parliament of Paris,” which, from its high sounding title, one would have supposed to be the supreme court of judicature of the country, as the House of Lords in England; but such is not the case; “the Parliaments of Paris” being merely old names for courts, which did not rank much above a Sheriff’s court in Scotland. And as we sometimes see such courts err in their decisions in our own day, that of the so-called “Parliament of Paris” may la-

<sup>1</sup> CARANZA de Partu Legitimo et Naturali, cap. ix. p. 432.

<sup>2</sup> CELONI Chirurgia, forense, tom. ii. p. 39.

<sup>3</sup> Annales d’ Hygiène Publique loc. cit.



bour under the same misfortune. The grounds on which they founded their judgment, are unfortunately not handed down to us, so that we cannot determine for ourselves whether it is borne out by the evidence received or not. He was said to be a five months' child, and lived to an advanced age.<sup>1</sup> The case mentioned in the "Causes Célèbres" is of no weight. The child was born five months after marriage; a council of physicians was held, who innocently decided "qu' une femme peut accoucher au bout de cinq mois," a decision which could not require remarkable professional acumen to arrive at, and the mother of the child was little better than a common prostitute.<sup>2</sup>

The next case I come to is one detailed by BROUZET as follows:—"In 1748, at Marseillan, a maritime town of Languedoc, a woman brought forth a male child just six months after another delivery. Deducting from that interval the period of the lochial discharge, little favourable to generation, and fixing this period at one month, it is clear that the birth took place at the close of the fifth. The infant was alive, but as small and feeble as an abortion of the same term, and really could be considered only as an abortion. He never uttered a cry; did not seem even to breathe; had the eyelids always closed; the

<sup>1</sup> CAPURON, op. et loco cit.

<sup>2</sup> Causes Celebres, vol. xi.



limbs flaccid and pendulous; in a word, was luckily declared to be alive only from certain slight movements, and the maintenance of its temperature. It was wrapt in fine linens, kept constantly warm, and got to swallow a few drops of lukewarm milk. In short, contrary to all probability, the mother by patience maintained it precisely in the state I have described for four entire months, during which he never discharged fæces, made but a few scarcely-perceptible movements, and never uttered a complaint. At length, exactly at the close of the four months, he began to cry, to pass fæces, to stir himself, to suck, and to grow like children at the full time; so that at the age of fifteen or sixteen months, he became stronger than others of that age.”<sup>1</sup> This case by BROUZET is exceedingly interesting, as it is an almost unequivocal instance of a viable child having been born at a less period of utero-gestation than six months,—how much less it is impossible to say with certainty; the description of the child agrees with what we should expect at the period stated; and the high standing of the narrator in the profession leads us to believe, that his statements may be received without distrust. There are, however, two objections to the case; *first*, the improbability of a living child not passing fæces for four months; and, *secondly*,

<sup>1</sup> BROUZET Essai sur l'Education Médicinale des Enfants, cap. ii. p. 37.



BROUZET not stating whether he saw it himself, or heard of it from another practitioner.

The next I find is one proposed by the Signory of Venice, to SPERO SPERONE, to whom his answer was, “Credo adunque esser cosa possibile, che una fanciulla, generata a dì 26 d’ Ottobre, ne gl’ anni 1539, tutta intera e perfetta uegna a nascere, il giorno 13 Aprile sequente, e viva tanto quanto suol viver comunimente ogni femina humana.”<sup>1</sup> The reason he gives for the above decision shows at once the estimation in which he ought to be held. He states his belief in the old story of a woman having become impregnated by bathing where a male had bathed before her, and says, that he considers the one case as possible as the other; the child mentioned above may have been viable, but it is not possible that it could have been born “tutta intera e perfetta” in 169 days. In Jardine’s trial already alluded to, a case was mentioned by PROFESSOR CHRISTISON, in which he confidently affirms the term of utero-gestation not to have been extended beyond 167 days. “The child had all the characters of a foetus of this time, measured thirteen inches, weighed twenty-three ounces, and was stronger than is usual; cried, moved, and passed urine. After death the lungs were found pretty fully dilated, and the parts of the nervous

<sup>1</sup> Dialogi di SPERONE, del tempo del Partorire delle Donne, p. 54.



system connected with respiration, were well developed." This child, however, lived only eight hours and a half.<sup>1</sup> Whether such a child can be said to have been viable or not, will be mentioned afterwards, when I come to consider the question, upon what ground is a medical jurist justified in affirming any given child to be or to have been viable? The next case of importance is one described by PROFESSOR FLEISCHMAN in the following terms:—"A woman miscarried in the third month. Not quite two months afterwards she conceived again, and continued well till the twenty-third week. Towards the twenty-fifth week, about ten days before it, she was attacked with shivering, &c. With the 25th week she was easily delivered. The child thus born at the beginning of the twenty-fifth week, was a girl, and alive, though feebly so. The body was all dark red, and covered with woolly hair; it moved the arms and legs, and in less than an hour, cried loudly. It was wrapped in cotton and kept warm; the breathing throughout the night was low but uniform, and the sleep unbroken, &c. The countenance had an oldish expression, as usual with such premature children; next day the child moved little, and was seldom heard to cry; in the evening it passed meconium and urine; in the middle of the week its cries were clearer, and its oldness of expression and wrin-

<sup>1</sup> Case against Rev. F. JARDINE, p. 147.



kled appearance had considerably disappeared. The day or two preceding its death, it often cried loudly. On examination after its decease the whole body was lean; the skin wrinkled; the length eleven inches and a half; the weight one pound five ounces. The hair of the head was close, short, brownish; the greater fontanelle closer than before death; the bones of the head moderately firm; the ears formed, but the cartilages still soft; the face pleasing in expression, and free of wrinkles; the eye-brows were slightly marked; the eye-lashes wanting; the nails of due length, not yet projecting, very soft and tender; the lungs had a pale reddish appearance, and were completely distended with air to their finest air-cells; both lungs had three lobes."<sup>1</sup> The next case which claims our attention is that of the child of the Rev. F. J—. There probably never was a case which afforded better opportunities for the fullest substantiation, yet from the carelessness of some and the ignorance, whether real or assumed, of others, the presbytery had great difficulty in coming to any decision, and therefore, according to the humane spirit of British law, gave the defendant the benefit of a doubt. The case stands thus: The Rev. Mr J. was married on the 3d of March 1835, and his first child was born on the 24th of August of the same year, being 174 days

<sup>1</sup> FLEISCHMANN in Hercke's Zeitschrift für die Staats arzneikunde VI., 12.



from the date of marriage, which child lived for eight months. On the assumption, that a child capable of living, could not be produced after a residence of only 174 days in utero, several of his parishioners raised against him the charge of "antenuptial fornication;" such is the substance of the libel. The evidence (for the prosecution) of the medical gentleman who attended Mrs J. on her confinement, is not worthy of notice, as he neither saw, observed, nor recollected anything.

The next witness for the prosecution, (Mrs Robertson) who received the child from Mr R \* \* immediately after its birth, stated, that though very small, it was in all respects like children at the full time, and treated like them; that it was regular'y formed; the skin was perfectly clean, and not wrinkled; there was hair on the head; the nails were well formed, and covered the fingers to their points; the child did not appear to have any difficulty in breathing; no unusual means were taken to maintain the child's warmth; it cried loudly, swallowed, and made water, immediately after birth.

The witnesses for the defence stated regarding the child, they never saw such an object, and were afraid to wash it in the ordinary way, for fear of the skin coming off. The lower limbs were not formed, as they appeared to have no heels, and the legs "ran straight out," (from the knees to the toes,) "like sticks;" the skin was covered with a "silky down-like mould," and generally wrinkled; there was no hair on the head; "there was some white fleshy thing on the fingers, the shape of nails, but not nails;" the child always breathed as if it were about to be choked; it slept very little; and uttered only a feeble cry.

The nurse who attended the child, from a few hours after its birth, and who is also a witness for the defence, is neither so confident in her assertions as to the appearances of prematurity, nor so horri-



fied at the unnatural aspect of the child, as the other witnesses on the same side, viz. the grandmother and two aunts, who may probably (and quite innocently too) have seen more deformity, and larger wrinkles, than mere casual spectators. Such is a very brief summary of the evidence of the parties, who saw the child at, or shortly after birth, and it is by no means surprising that the Presbytery should have had considerable difficulty in coming to a decision, when statements of such a contradictory nature were sworn to before them. Nineteen days after birth, on account of the "*fama clamosa*" which was got up against the Defendant, an accoucheur of great experience, at the express request of the Presbytery, came to inspect the child, and considered himself justified in stating, that the "fama against the Minister of K \* \* \* was utterly groundless." With regard to the mother, Mrs J., some of the witnesses stated, that at the summer sacrament after the marriage, (probably in May,) Mrs. J. looked so large that they (the witnesses) thought she would be confined in about a month; this also was directly contradicted by other testimony. For the defender it was urged that Mrs J., then Miss M., offered to postpone the marriage for three months, which she was not likely to have done had she been aware that she was then pregnant. It was also proved that Mrs J. had menstruated the week before marriage. These



two latter circumstances are, however, of little importance, as it is generally admitted that a woman may menstruate for a month or two after conception, and may therefore be pregnant without being aware of it, during the earlier period of gestation. It is extremely difficult to come to any decision on evidence of so conflicting a character; it appears to me, however, that the child exhibited marks of prematurity, though by no means so strongly characterized as some of the witnesses for the defence imagined.<sup>1</sup>

The next case, that recorded by MR TAIT, House-Surgeon to the Edinburgh Lock Hospital, fixes with, if possible, still greater accuracy, the precise period of utero-gestation. "A woman married on the 22d July 1839, menstruated naturally the week before her marriage, and felt herself quite well only two days before that event, but the menses had never afterwards returned. On the 18th January 1840, she was delivered of a female child, which was born alive, but was so feeble, and so premature in its whole appearance, that the question of its viability was never once entertained; its cry was so weak as scarcely to be heard a few yards distant, and more resembled the mew of a kitten, than the natural cry of an infant. There were no nails on its fingers and toes; a thick dark down covered the head instead

<sup>1</sup> Case of the Parishioners of Kinghorn against the Rev. F. J—.



of hair; the skin everywhere was unusually florid and thin, and the extremities imperfectly developed; the bones of the head were soft and easily compressed, and their approximation at the sutures was imperfect. The membranæ pupillares were entire. Notwithstanding these premature appearances, every care was taken to preserve the child alive, by wrapping it in soft cotton wool, &c., and keeping it in a basket beside the fire; it was so feeble as to be unable to grasp the mother's nipple, and was nursed during the first three weeks by milk taken from the breast, introduced at first by a quill, and afterwards by a teaspoon. Before it began to suck, it was so shrivelled and covered with down similar to that on its head at its birth, that several professional friends who saw it, declared that it would not live, and were surprised that it had survived so long. So soon, however, as it began to suck, its whole appearance began to alter, and it became an object of great interest and anxiety, and its length and weight were for the first time accurately taken on the 27th February, being forty days after its birth, and were as follows: viz. weight, three pounds; length, thirteen inches; centre of the body nearly an inch above the umbilicus. On the 16th March the child was measured, when its length was fully thirteen inches and a half; weight, three pounds ten ounces and a half; centre of the body three quarters of an inch above



the umbilicus. April 11, weight five pounds three ounces; length, seventeen inches, centre of the body at the superior margin of the umbilicus. The nails are now formed on the fingers and toes; the aspect is more natural than hitherto; the down or hair has almost entirely disappeared from every part of the body. From the above period it continued to thrive well until the 27th of May, when it was seized with measles and died after two days' illness."<sup>1</sup> Of all the cases related, that by MR TAIT is much the most perfect in its evidence, and establishes the possibility of children being reared who are born before the commencement of the seventh month of utero-gestation. It has been objected to MR TAIT'S case, that the woman might have been pregnant before marriage, but although this is possible, and "to step aside is human," we have no right to start such an objection, without a shade even of presumptive evidence in its favour, and where the appearances of the child corresponded exactly with what are expected in one born at the conclusion of the sixth month. The next cases of viability at the sixth month, are those detailed by BELLOC. The wife of a rich merchant, who had already had several children, bore a daughter very imperfectly formed; this child had only a little down on her head, and no hair, her

<sup>1</sup> Lancet, vol. ii. for 1841-42, p. 119.



nails were not half formed, and she passed several days without being able or desiring to suck. The mother assured me that she was only in the sixth month of pregnancy; nevertheless this child lived to the age of fifteen years, in the enjoyment of excellent health. There is also a second case by BELLOC, not quite so circumstantial as the first. A child only a foot long, the skin "*rouge marbré*," the head covered with down, the nails ill formed. It was fed with the spoon for eight days, because it neither could nor would take the nipple, nevertheless it lived to the age of seventeen years. The mother did not consider that she had been seven months pregnant: I considered her at the most six.<sup>1</sup> On the trial of the Rev. Mr J., three cases of six months' children were cited by DR THATCHER, from his own personal experience, which, as far as he knew, were alive two years after birth. An instance of 190 days is given by DR M'WHIRTER; the circumstances described, and the great practical experience of the narrator, are sufficient to mark the case as one on which full reliance may be placed. Those also of DR COMBE and MR MILLAR are worthy of notice, the former a gestation of very nearly seven months, the latter one of six. The next case which I shall mention is one of much importance, and where the evidence of the

<sup>1</sup> Cours de Med. Leg., pp. 77, 78.



period of conception is almost as complete as that in MR TAIT'S case; it occurred in the practice of DR D'OUTREPONT, Professor of Midwifery at Wurzburg. "The mother, a young woman, whose catamenia had always been perfectly regular, was repeatedly connected with her husband, for some time after the cessation of their last flow. About a fortnight after this cessation of their flow she underwent a general change in appearance, and began to have frequent attacks of vomiting and fainting, symptoms which she never had in life before. These symptoms continuing, the catamenia did not return; and about twenty weeks after their last appearance she felt the first movements of the child. Five weeks after this, and twenty-seven weeks after the last appearance of the catamenia, she was seized with labour-pains, and a male child was produced, which breathed immediately on being born. It measured thirteen and a half inches, and weighed one pound and a half. Its skin was covered with smooth lank down, and was much wrinkled. The whole extremities were exceedingly small in proportion to the trunk, and were kept constantly bent over the body, as during the existence of the fœtus in the womb. The nails of the fingers and toes were like mere folds of skin; the testicles were still within the belly, and the pupillary membrane was entire. The child whined, but could not cry, slept almost constantly, awoke



only once a-day, seldom opened its eyelids, and was obviously insensible both to light and sound. For some time it was fed with the spoon, on diluted milk and sugar. In four weeks the down began to drop off from the skin. In fifteen weeks it had made very little progress in any respect. The wrinkles had disappeared however from the skin, and the length was increased an inch and three quarters. But from this time, which corresponded with the fortieth or forty-second week after impregnation,—that is, with the full period of utero-gestation,—it made rapid advances, sleeping less, eating more, crying strongly, and becoming evidently sensible to sound, and pleased with the light. When fourteen months old, it was of the weight and stature of a child born at the full time. In the eighteenth month the testicles descended into the scrotum, without causing him any annoyance. In like manner the teeth began to appear easily in his third year. He did not begin to walk till half a year later; and at that time he differed from other children of the same age, not only in littleness, but likewise in the singular oldness of his expression of countenance. When DR D'OUTREPONT saw him in 1816 he was eleven years of age, and was as big as a boy of seven or eight." The evidence in this case is perfect, both as regards the date of conception, within a fortnight, and also as regards the appear-



ances of the foetus, unequivocally establishing the fact, that a viable child may be born at a less period than 190 days' gestation.<sup>1</sup> A case occurred to DR COLLINS of Dublin, in which he believed the child to have been only six months and twelve days in utero; it was alive and perfectly healthy two months after birth. PROFESSOR PAUL DUBOIS stated to me that he had met with an instance of a viable child, born after a gestation of only six months and a half. Having now given several cases of children living, though born long before the middle of the seventh month, I consider it useless to enter into a detail of instances, in which the residence in utero was of longer duration.

I shall now proceed to notice the fallacies under which cases of early viability may labour; the first, and most important of these on the part of the mother, is the acknowledged difficulty of fixing the precise period of conception, and even of ascertaining pregnancy in the earlier months. That the generality of females conceive without being at all aware of it, is universally admitted; some very rare instances are, however, to be met with, where women have been able to tell to a day when their confinement would take place. When a married female finds herself annoyed by irritability of the stomach,

<sup>1</sup> HENCKE's Zeitschrift für die Staats Arzneykunde, vi. 19. Case against Rev. F. Jardine, evidence of PROFESSOR CHRISTISON.



sickness, or vomiting in the morning, heartburn during the day, or in the evening, and sleeplessness at night, together with cessation of the menses, she generally considers herself certain of being pregnant; nevertheless, we frequently observe cases, where all those symptoms are present, without the patient being pregnant; and *vice versa*, the patient being pregnant, and none of them present. Formerly practitioners agreed that the catamenia never appeared during pregnancy; it is now, however, allowed that they, or a discharge so similar as not to be distinguishable from them, are occasionally seen for a period or two after conception, and some very rare cases are related, where menstruation was never regular except during pregnancy,<sup>1</sup> and others again where women have borne families without ever having menstruated.<sup>2</sup> Retension of the menses again may arise from various causes totally unconnected with pregnancy, and amenorrhœa frequently induces the symptoms mentioned above; hence comes the uncertainty of determining the length of gestation, and hence, I have no doubt, have originated many of those cases of supposed early viability, and of protracted gesta-

<sup>1</sup> DAVENTER Nov. Lum. Obstet., cap. xv. DEWEES' Compend. Midwif. p. 97. BAUDELLOCQUE, Art d' Accouch., p. 197.

<sup>2</sup> FODERE, Med. Leg., tom. i. p. 395. CAPURON, Med. Leg., pp. 96, 97. PETER FRANK, de Morb. Hom. Cur. art. Amenorrhœa.



tion mentioned by the older authors. It frequently happens, also, that women become pregnant without having menstruated since the previous confinement. The areola round the nipple is not a more certain diagnostic of pregnancy than the cessation of the menses, as very frequently the areola is wanting in the early months, and often present in cases of simple dysmenorrhœa. It is not necessary for me to notice here the various other symptoms of pregnancy, such as quickening, ballotment, and those derived from auscultation, as they do not occur until comparatively late in pregnancy, and at uncertain periods, being useful, not for the purpose of determining the commencement of pregnancy, but merely for ascertaining its existence; whereas, in the question with which I am engaged, the chief point is, if possible, to fix the beginning of gestation. To a certain class of cases of early viability, it has been objected, that they were instances of superfœtation, or of double uterus. The class I refer to are those in which, for example, a woman having been delivered of a child at the full time, say on the first of January, is delivered of another viable child that day six months. Here the duration of the latter pregnancy is accurately fixed by the date of the previous delivery, and one or other of the above is the only objection which can be urged against it. Among the older authors, the belief in superfœtation



was very general; so much so, that BRASSAVOLUS observes, that he has seen superfœtation epidemic.<sup>1</sup> Cases of superfœtation are of two kinds; 1st, Where two apparently perfectly mature children are born at an interval of three or five months; 2dly, Where a mature fœtus, and one of the fourth or fifth month, are born at the same time. The former of these occurrences can only be explained by supposing superfœtation, or double uterus. The latter is certainly the more probable, if the idea of the former can be at all entertained; for when we consider the changes which take place in the uterus shortly after impregnation, it is impossible to imagine how fecundation could again happen, the uterus being at the time some months pregnant; so that in fact the only way to explain such cases as those of DR MATON<sup>2</sup> and DR DESGRANGES,<sup>3</sup> is to consider them as examples of double uterus: to support which idea, there is in the Pathological Collection of Vienna a preparation of double uterus, each of which bears evident marks of having been pregnant. As to the cases related by BUFFON and other authors, of a woman having produced at the same time a negro and a mulatto child, they seem by no means impos-

<sup>1</sup> MUSA BRASSAVOLUS, Comment. ad Aphorism 38, lib. v. p. 817. Nos vidimus superfœtationem quandoque fuisse epidemicam affectionem.

<sup>2</sup> Transact. Roy. Coll. Phys. Lond., vol. iv. p. 161.

<sup>3</sup> DEVERGIE, tom. i. p. 471.



sible, only a few hours having elapsed between the woman's intercourse with the white and black man; there was then nothing to prevent the second sexual act being as prolific as the first. Cases are known where females have borne two children, each apparently at the full time, after intervals varying from fifteen to thirty days; and this cessation of uterine action, although a fœtus is contained in the organ, may be explained on the same principle as the disappearance of threatened abortion. An interesting case is mentioned by PROFESSOR MONTGOMERY, which somewhat bears on this subject. A lady "expelled an entire ovum of the fourth month; in a few days she was well again, and no suspicion was entertained but that she had parted with the contents of the uterus; she remarked, however, that her size was not diminished, but was on the contrary increasing; soon afterwards, to her infinite surprise, she distinctly perceived foetal movements, and at the expiration at the time of which she had originally expected her confinement, she gave birth to a healthy full-grown child."<sup>1</sup> In former times such a case would probably have been considered an example of viability, after a gestation of five months only.

In the second variety, where one of the children

<sup>1</sup> MONTGOMERY, op. cit., p. 205.



is found considerably smaller than the other, upon examination of the secundines, appearances are observed sufficient to show that its development has been retarded, and that its diminutive size is not caused by its having been generated at a later period than its fellow. The fallacies to which reported cases of early viability are liable to on the part of the foetus, arise from the great diversity we find in the size and weight which it presents, not only at the full term, but also at various periods during pregnancy. According to ROEDERER, the average length of a male at the full time is twenty inches and a third; that of a female seventeen and seventeen-eighteenths. In the table of comparative weight given by DR JOSEPH CLARK, the average of children at the full time was seven pounds. "In the Wurtemberg Report it is stated, that children were born weighing from nine to fifteen pounds, and measuring from nineteen to twenty-eight inches." In the Pathological Museum of Copenhagen, there is a child which was born dead, and weighed fifteen pounds at birth. Instances might be given in abundance, of children weighing ten, twelve, or thirteen pounds, and as large as the generality of infants at one month or six weeks after birth. In a case reported in *The Lancet*, of the 9th of April 1842, the head of the foetus was so large, that it could not be extracted, although twice perforated, and the body



resembled in size that of a child three months old. Were this child, or such an one as that above mentioned, born after a gestation of 174 days only, with its development proportionably in advance, it is extremely probable that it would survive; at all events, it would have a better chance of doing so, than one whose development simply corresponded with the average; and the appearances of immaturity not agreeing with what is usually found at that period, it would in all likelihood be rejected, and added to the other supposed instances of a mistake in the mother's reckoning. Again, children may be born, whose weight and size, unlike those already described, is far below the average. It would be useless multiplying instances of this, I shall therefore merely mention one related by DR MONTGOMERY; "A lady who menstruated in the last week of July, began about the middle of August to exhibit unequivocal symptoms of pregnancy, which proceeded regularly till the middle of October, when indications of threatened abortion appeared; the previously existing symptoms of pregnancy then disappeared, and it was supposed that the ovum had escaped among the masses of coagula which had been expelled. After this the lady resumed her ordinary habits, and went into society as usual. On the 7th January following, periodical pains and uterine hæmorrhage having come on, an ovum was ex-



pelled, in size, form, and growth, of a foetus resembling one of less than two months:" this foetus had been more than six months in utero. In cases where a female, six or seven months after marriage, or the return of her husband, produces a healthy, well formed child, of the full size and development, we need scarcely hesitate to reject it as an example of early viability, as no instance has occurred of a child avowedly of six or seven months' growth presenting an appearance even remotely resembling that of a full-grown and matured foetus. "Even though the size may not enable us to distinguish the one from the other satisfactorily, there are several characters of imperfect development, which mark the really premature foetus, whatever be its size, while on the other hand, there are others which accompany the fully matured child, although deficient in bulk." It is unnecessary for me to dwell on the signs of immaturity in the foetus; one merely I shall briefly allude to, as it is not long since attention was first attracted to it, viz. the position of the central point of the body. At the sixth month half the length of the foetus corresponds with the xiphoid cartilage; at the seventh month it is between the xiphoid cartilage and the umbilicus, but nearer the former; at the eighth month it is nearer the umbilicus than the sternum; MR TAIT'S case (page 25) forms a good practical illustration of this point.



I come now to the consideration of the last question, viz. On what grounds is a medical man justified in affirming any given child to be, or to have been viable? We have seen above, that a residence in utero of a given number of months is not always sufficient to develop the organization of a fœtus to such a point, that it will be able to support an extra-uterine existence; and the single fact of a child having maintained extra-uterine life for a few days, is not sufficient to warrant us in asserting that it is viable, as instances are known of anencephalous fœtuses having lived from three to twenty days.<sup>1</sup> We must found our opinion as to a child's viability chiefly on the consideration of its absolute development, and the fitness of its various organs to carry on their due functions, respiration, digestion, and circulation; as the greatest difficulty against which a prematurely-born fœtus has to struggle for life, is the adaptation of its respiratory and circulatory systems, to its new mode of existence. It is unnecessary here to enter into a detail of the physiological condition required by the several organs for the proper performance of their office; I shall therefore conclude by very briefly considering the foregoing evidence. The cases of four months and a half and five months, are not to be depended on, as they are recorded only by

<sup>1</sup> Lectures of PROFESSOR AMOS, Lond. Med. Gaz., 1831.



the older authors, in whose time the characters marking the various periods of intra-uterine development were but imperfectly known, and the medical man was obliged to trust mainly to the often fallacious accounts of the mother. If we turn again to the more modern authors, we find them erring in the contrary opinion, and regarding as fabulous or impossible, all gestations which have not "sept mois accomplis." The case of earliest viability on which we can depend, is that of MR TAIT at 179 days, and after it that of PROFESSOR D'OUTREPONT at 189. We have therefore evidence that a child capable of continuing in extra-uterine life, may be born long before the middle of the sixth month. Regarding the child mentioned by PROFESSOR CHRISTISON, as having been born after a gestation of only 167 days, we can only draw the negative conclusion, that it is not impossible it might have been viable; there having been no appearance found on post-mortem examination, which would absolutely prevent the continuance of life. The viability of six months' children is now more generally admitted, and the belief in its possibility no longer looked upon as credulity, and therefore they require no further reconsideration.





## APPENDIX.

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*Note to note 13, p. 4.*

CAPURON mentions a case at six months and a half.

*Note to p. 10, third line from the bottom.*

“To fix bastardy on a child, the husband’s absence must continue till within six lunar months of the birth.”—*Erskine’s Institutes.*

HEBENSTREIT states upon the authority of SÜETONIUS, that AUGUSTUS CÆSAR had a child born to him after a gestation of three months, which continued in life, on which he makes the short comment, “*τοῖς εὐτυχουσι καὶ παιδία τριμηνᾶ.*” I have been unable to find the original statement in SÜETONIUS.

*Note to note 6, p. 3.*

A case of viability after a gestation of only 23 weeks, is mentioned in GOOD’S Study of Medicine, by DOANE, vol. ii. note p. 478. The case is scarcely worthy of notice, as there is nothing but the mere assertion of the author, that the pregnancy was of so short a duration; the appearances of the fœtus are not even mentioned.

*Case by DR COLLINS, referred to at page 30.*

MERRION SQUARE, DUBLIN, June 30, 1840.

MY DEAR SIR,—\* \* \* \* I have at this moment a most singular case of a child living and doing well, which was born at very little beyond the sixth month, certainly not more than ten or twelve days beyond that period. It measured only between nine and ten inches in length at birth. It was born under my superintendence on the 4th April last, (1840,) and is now as healthy a little creature as can be. I confess I was astonished, and watched it anxiously for the first six weeks, visiting it two or three times daily for many days. Believe me, dear Sir, very truly yours,

(Signed) ROBERT COLLINS.

To WILLIAM CAMPBELL, Esq., M.D., Edinburgh.





