



n Infanticide

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A.

I was induced to select this subject for a thesis, from a desire, to satisfy my own mind, "upon the effects of Insufflation on the Foetal lungs." Medical Jurists for the most part, holding the doctrine, that artificial dilatation of the lungs can be easily detected by the application of strong pressure to them - whereby they are deprived of air, and sink when immersed in water. For my own part I am at a loss to understand this matter.

Will not the opening of the trachea and the injection of air into the lungs, permeate ad completely the ultimate ramifications of the air vesicles as if the process had taken place naturally? Does not the chest heave up and expand under the weight of the column of air; and in like manner when that weight is withdrawn, does not the air escape in a strong jet: which fact combined with the uniform expansion of the chest - proves that the lungs must have been everywhere occupied with the gas?

The source of difficulty in understanding the workings of the Nervous System, lies in

the circumstance - that its structure has no perceptible or understood subservience to its functions. But in the lungs we discover that adaptation of means to an end which is so conspicuous in other parts of the body.

Here we find an arrangement of tubes provided with muscular and elastic tissue, conducting to a series of little chambers whose walls are surrounded by a multitude of blood-vessels. The muscular and elastic structure of their walls will yield as readily and contemporaneously to the dilating force of artificial as of natural respiration.

No explanation is afforded by those who hold the belief - that the air in the artificially inflated lung can be dismissed by pressure.

It may be, that the blood which accumulates in the lungs in natural respiration, exercises some attractive affinity for the air, necessary, for the thorough impregnation of all the textures of the organ; whereby it is impossible to separate them by pressure or any mechanical violence. My experiments on this head have been very limited - only two: but I trust that I may

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yet have ample opportunities of prosecuting this most interesting enquiry. The details of the Case will be found, under the head of Spontaneous Insufflation.

The obstacles in the way of obtaining Books on Infanticide - precludes my entering on the Literature of the Subject.

Before commencing the more important part of this subject, I mean, to glance at a few of the circumstances that endangered the life of the child during the process of parturition.

1. It is well known that infantile mortality increases with protracted labour; and still more so when there is any disproportion between the size of the mother and that of the child. — Statistics show, that one out of three lives is lost in all pelvic presentations even with medical aid. The child is asphyxiated from the contraction of the os uteri around the neck during the pains, or from stretching of the vessels of the cord and consequent interference with the flow of blood. Again the uterus may act so powerfully and continuously that the circulation in the placenta is completely stopped — or the placental current as yet flowing freely, a coil of the cord may encircle the body of the child and bring about a like result. Or, the body being born, and the head still lingering in the passage; the mother endeavours to deliver herself by seizing hold of the presenting part; and may cause such an amount of contortion as will prove fatal to the child: even if the vertebrae of the neck are not dislocated. Here the injury would shew that the child was living when it was inflicted; whilst, the absence of the

Sign of respiration would suggest the mode of it.

Many lives are lost from mal-position and separation of the placenta: death resulting from the draining away of the blood and pressure producing asphyxia. Scarcely less hazardous are those cases, where the funis is the presenting part; unless happily it gets lodged in some soft nook where pressure has little influence over it.

The foetus may be expelled enclosed in its bag of membranes: the most remarkable instances of which are two recorded by Wisberg. In the first case the infant was allowed to remain seven, and in the second nine minutes thus entombed and both were living. Such an unusual appearance might be a source of alarm; and the child might die from want of the usual attention. _____ The cord may be only a few inches long; accordingly when the head is born the shoulder will be arrested unless the placenta should separate. In such a case the funis would require to be divided in the vagina. otherwise asphyxia or apoplexy from pressure around the neck of the child might occur. The mechanical effect of the umbilical cord encircling the neck of the foetus is soon apparent if reduction be not speedily effected.

The child may escape from the mother and fall to the ground whilst she is standing or resting on her knees and elbows. If the cord be unusually short it may give way: and the point of laceration in all likelihood will be where it joins the navel: from this cause the infant might die from the haemorrhage. Or, escaping this danger, the force of the fall on the head may fracture one or both parietal bones; or even rupture the committal membranes: causing death by the extravasation of blood.

I had an opportunity of seeing a case of this nature not many weeks ago. The mother, was leaning over the bed when I entered the ward, and during a very strong pain, the child fell violently on the floor before I could interfere. It was a full grown male weighing seven pounds and a half and presented by the head. The left parietal bone was slightly flattened at the time, and an extensive bruise formed - but there was no fracture. The umbilical cord measured fully two inches. The child did not appear to suffer from its precipitation in the slightest.

Infants are generally born with the face towards the sacrum, and remain lying prone, when the mother is in the usual obstetrical position. A female

delivered alone may lose her child in this state from several causes, such as mania - faintness - or complete Syncope - coma or stupor - epilepsy or apoplexy. The natural instincts of the parent to protect her offspring from danger, would teach her to relieve the infant from a situation where it cannot breathe: but any of the foregoing complications would furnish ample extenuating circumstances. Dr. Good dwells with great humanity upon the unhappy position of the patients confined for life in Bethlem as Criminal Lunatics, who have killed their children during attacks of puerperal mania. Some of these poor females, have passed the child-bearing age - are perfectly clear in intellect conscious of what they have done and suffer intense misery therefrom: whilst they have their misery enhanced by mixing constantly with confirmed Lunatics. Surely philanthropy should find a remedy for such a state of things.

The Umbilical may be divided and yet not tied. This is not necessarily fatal - for when the child is healthy and vigorous and breathes well and freely - there is no tendency to bleed at the navel. On the contrary, should the child be weak and languid, the oxygenation of the blood is not carried on,

properly by the lungs, and the new circulation is not completely set up.

Again the infant may die from tough glairy mucus accumulating in the air passages; and this will the more readily happen if the child be permitted to lie long on its back.

II Questions relating to this subject are necessarily more difficult to decide than those of homicide in general: for the first step in the enquiry is to determine - Whether the child was born alive or not? In many instances, there will be little hesitation in pronouncing an affirmative - but it will happen that the most expert in such researches will fail - unable to express their opinion definitely - beyond stating their impressions. Two classes of questions are thus to be solved: the first regarding the child and the second the mother.

1. Whether the child was born alive?

2. If it was born dead - did it die during parturition or some time before - ?

3. If it be proved to have survived its birth, whether or not, its death is to be ascribed to natural and unavoidable circumstances - or to violence - or neglect of due care?

4. If negligence be the cause of death, whether or

not such conduct is criminal? _____

II The Mother

If she has been recently confined, and if so, whether the period of her confinement corresponds to the supposed time of the child's birth?

1. Whether the child was born alive or not?

Before we can decide this we must enter a little into the subject of foetal development, and the generally received time that the foetus will continue to live when separated from the parent.

It is not till the fourteenth or fifteenth week of impregnation that we can distinguish all the external parts of the foetus. The skin is of a rosey hue, and tolerably dense - and fat begins to appear. The mouth is large and open - Membrana pupillaris very evident - nails forming - genital organs and sex distinct. The umbilicus is placed near the pubis, Hair on the head - very thinly dispersed - short - and of a white silvery colour - The brain is of uniform consistence - lungs very small - heart voluminous - ventricles and auricles not very distinct - Liver very large - In the male the testicles are lodged high up in the loins and the ovaries of the female are similarly placed. The great relative disproportion between the foetus and the liquor

amniotic disappearing and the head is descending towards the orifice of the uterus. About the end of the fifth month, the movements of the foetus, consequent upon the elevation of the uterus from the pelvis, become evident to the mother: hence the popular name of quickening. The usual weight of the foetus at this time is from five ounces to seven, and it measures from eight inches to nine and a half. At the seventh month the different parts have assumed more firmness from the greater vitality of the foetus. It weighs from two and a half to four pounds: and measures from eleven to thirteen inches. The skin is covered with a white sebaceous matter—eyelids still agglutinated—face of a purplish hue—gall-bladder containing insipid serous fluid. The testis are near the kidneys. The middle point of the body is at the lower end of the sternum.

8th Month—Length thirteen to sixteen inches—Weight four to six pounds—Skin is pale and covered with fine short hairs and with well marked sebaceous envelope—Nails reaching to the extremities of the fingers and toes. The pia-mater becomes more adherent to the brain—and slight grooves, the rudiments of convolutions are seen. The lungs are of a reddish colour: and the auricles and ventricles of the heart are now distinct. In males, the testicles are frequently engaged in the abdominal rings.

9th Month. — Length sixteen to eighteen inches. — Weight five to eight pounds. The head is large and firm. Hair longer thicker and of a deeper colour. The testicles have now taken up their position in the Scrotum. Nervous system well developed. The longitudinal diameter of the head measures from four to four and a half inches, and the Bi-parietal three and a half inches. The lungs are more bulky and redder in colour. The branch of the Pulmonary artery communicating with the aorta called the Ductus Arteriosus measures about an inch in length; and its walls are thick and dense. The aperture between the two auricles of the heart is very large; and the valve for their closure after birth has assumed more definite proportions. The liver is secreting bile and the bladder contains urine: and all the organs are qualified for the performance of their duties.

Viability of the Child.

The action of the uterus is liable to supervene at any period of pregnancy; although from the frail connection between the ovum and the uterus it occurs most frequently before the third month of gestation. At the date corresponding to each menstrual discharge, it is also liable to repulsive action. If it occur before, or at, the sixth month it is called an abortion: and subsequent to this time, before the full

term - premature labour. Children have lived although born at the sixth month of utero-gestation; but this may be considered the exception to the rule. Many eminent men have been ushered into the world at seventh month births; such as Sir Isaac Newton and Buonaparte: but even at this age the most assiduous nursing and care is required in protecting the frail being from the influence of external agents; amongst the most fatal of which is exposure to cold. I have confin'd a woman of a living child at the sixth month which weighed three pounds and a quarter - and thirteen inches in length. It was a very weak and puny creature. It was living at the age of three weeks when I saw it last. It may be stated as a general rule - that all births before the seventh month of impregnation are non-viable.

Was the Child Born Alive?

This involves some of the nicest questions in Forensic Medicine; and requires great tact and care in the necessary examination - as well as an accurate knowledge of foetal development for the appreciation of the facts elicited.

First as to the legal meaning of the term "born alive". It has been decided that to constitute a live birth, the child must have been living, after the whole body has

been born, and that it must have an independent circulation. It is not necessary that the umbilical cord should have been divided - for the child may be still connected with the mother by the cord and the killing of it would constitute murder. The condition of the lungs affords the best evidence of live-birth: for if no respiratory signs are present there is strong probability that the child was still born. In the absence of respiration other proofs may exist that the child had or had not been born alive and this leads to two divisions of the subject

1st What signs have we of the child being born alive independent of, and previous to respiration, and

2nd The signs of live-birth derived from and subsequent to respiration.

1st Evidence of live-birth before Respiration has taken place _____ must be of a negative or positive character. If symptoms of intra-uterine death exist it is negative - positive if we find such injuries as must have been inflicted when the blood was still circulating - always excepting such injuries as might have been inflicted during labour.

Negative Sign _____ as of maceration or putrefaction at birth will be detected at once - more especially the latter. the former requires some notice.

Dead animal matter immersed in water, more particularly running water, undergoes certain changes, resulting in its conversion into adipocere; resembling in appearance spermaceti. The dead foetus, placed in like circumstances becomes altered in a similar way. According to Dr. Gibbs (in a paper published in the Philosophical Transactions for 1794-5) five or six weeks must elapse before this change is effected to any great extent in a body placed in running water. Five to twenty days is the common time that passes between the death, and the expulsion of the child; and in proportion to the period of retention will the consistence and Cascity of the body vary. The epidermis readily peels off upon the slightest contact. The whole surface is of a reddish dark hue, but no green spots are visible. Serum of the consistence of jelly occupies the cellular and areolar spaces. The cuticle upon the hands and feet as well as the duplicature of the body are white, shrivelled, and sodden; as if from the application of a poultice. A soapy fluid covers the entire skin; so that when handled it slips from the grasp. Everywhere the body is shrunken and relaxed. the ribs are prominent; and the thorax flattened. The head, falls into whatever position

it may be placed, and is soft and yielding. The organs of generation have a deep red-colour - more so than the head and face. The several cavities of the body are occupied with the same fluid that is found in the areolar tissues; whilst the viscera are of a reddish brown colour. The umbilical cord is straight, not twisted - flaccid, and enlarged, from infiltration of serum; and like all the other vessels of the body is easily torn.

The above is quite distinct from putrefaction in air or water - no odour of decomposition is perceptible. When this state is well marked it would be difficult to mistake it for anything else: but if the child died but a short time before its expulsion, the absence of respiration on the one hand and of marks of violence accompanied by copious effusion of blood on the other, would go far to prove that the child was still born.

I have shewn previously that a child may be born alive, and be destroyed before it has respired. If it has been killed by violence whilst the blood was circulating, however feebly, that circumstance would determine the nature of the case - provided, they are not of a nature that

might have been inflicted during delivery.

All the above conclusions would be strengthened; if the mother alleged that for some time previous to her confinement, she had ceased to recognise the movements of the child - that her abdomen appeared heavier, and her gait unsteady - that she lost her appetite; and fell ill - shivered, and became agitated, and feverish. Such evidence is very unlikely to be adduced in Courts of Law. In conclusion, it may be stated, that the cases in which the Medical Jurist will be called upon to give proofs of live-birth, before respiration has taken place must be very rare - as few infants are born with the blood circulating however, feeble, without respiring however imperfectly.

Was the child breathed.

We may be able to decide at once that the child had breathed - but this is not altogether a decided proof that it was born alive. For it may have breathed during the birth, and perished before its completion. Hence two questions arise 1 Was the child breathed?
 2 Did it breathe - before - during or after delivery?
 3rd Was the child breathed? The lungs of the

foetus are dense. Compact and of a dull red-colour. They are furrowed at certain parts, indicating their division into lobules. Not visible when the organ is congested. They occupy the posterior part of the chest, and leave the greater portion of the heart exposed. Being of a greater density than water they sink in that fluid. When the vital connections of the Mother and Child have ceased. Respiration becomes necessary for the continuance of the life of the infant. The effect of respiration and inflation will vary according to the degree of either. The development of the air cells forms the best test of their having occurred. If a fresh lung be examined these vessels will be indicated by a bright vermilion spot, that depends in proportion to the quantity of blood in the lungs. If some time have passed before they are examined, they will be found of a pinkish colour. These vessels occur in patches and are not elevated. The only appearances, with which they are likely to be confounded are —

- 1st Small Echymoses and
- 2nd Effects of Guttation.

The former may be detected by their rounded form — their colour — which differs very little from that of the surrounding lung — and the absence of

anything resembling a developed vesicle. Lungs may float in water, from the accumulation of gaseous matter in their substance, during the process of decay.

But before such can happen, the rest of the body must be far advanced in putrefaction. Seeing that the lungs withstand its inroads longer than any of the other soft tissues. Air the product of putrefaction is generally situated between the surface of the lung and the pleura: in the shape of diffused globules, which when pressed upon by the finger, disappear. The crepitation, denoting a dilated lung, is here absent - but a certain degree of putrefaction will prevent its being recognised in the lungs of an infant that had respired. The best test is - to squeeze such portions of lung firmly, so as to deprive them of air, so that when immersed in water - they will sink.

Devergie after stating that an attentive examination of several infants which he had made at the Maternity during nearly nine months - had enabled him to distinguish a priori and without any other aid the lungs of a still born infant - from those of one that had breathed - and also to determine whether the air had dilated all parts of the lungs or merely certain portions of them: and adds that in many cases he

could determine whether the distension of the lungs with air, had been the result of respiration or of insufflation. He says, that in the air introduced by respiration there exists a minute injection of capillaries on the surface of the air cells, which does not take place in the case of inflation. But as even Desvergie himself was several times at fault in this matter - the investigation will be of little value.

Cruveilhier in his morbid anatomy, describes the bright vermilion air cells, as disease of the foetal lungs; and it is not a little remarkable that this simple sign of respiration should have been so long overlooked. As physiology became better understood and studied, more comprehensive views shewed -

that the alteration in specific gravity of the lungs was not the only means of determining the question at issue. Coincident with the performance of respiration is the increased afflux of blood to that organ which cannot occur from artificial insufflation after death, or when the circulation has ceased.

Hence there is an increased weight of the lungs themselves, and an increase of weight as compared with that of the body. Proceeding upon this principle Ploquet (Commentarius in Processus Criminale, Sect. II)

found on examination, that the body of a male infant born dead, and which had not respired — weighed 53040 grs. comprising the lungs; and that these organs alone weighed 792 grs.; the proportion then of the lungs to the body was as 1 to 67.

In another case the proportion was as 1 to 70. He then examined a third, born at the full time, and which had respired; and here the proportion of the weight of the lungs to that of the body was as 2 to 70. Attention was now directed to this enquiry; and the result shewed, as might have been expected, great discrepancy in the results. Independently of the construction of the body — the manner in which respiration is effected in new born infants would set all rules at defiance.

Respiration is not a sudden but a gradual process — rarely — perhaps never completed in a few inspirations — often remaining incomplete and partial after many hours — days — or even weeks — It follows that the majority of cases that come before the Medical Jurist — are where the process of respiration is incompletely set up:

Next Daniel stated; that an opinion might be formed of the presence of respiration, by immersing

the lungs in a certain quantity of water. Compressing them strongly - and the increase in the weight of the fluid, would denote the loss that the lung had sustained. But the objections urged against the test of Ploquet - apply with greater force to this.

Hydrostatic Test. _____ This is alone _____ interesting as regards the mere act of respiration - the question "when or where did respiration take place" being consequent on the fact of the determination of respiration. Till lately the lungs entire or divided were simply immersed in water of a temperature of 60°. but they are in addition now subjected to strong pressure. If it be argued - that if lungs both entire and divided be put into clean water of about 60° and do not float - respiration has not taken place two objections may be raised -

1. The child may have breathed - but the lungs sink in consequence of disease.
2. Respiration may have taken place, but so partially, though the organs are perfectly healthy, that neither the entire lungs, nor any part of them, will float.

In considering the first objection the probability of disease occurring both before, and after birth, is to be noted. The disease may be so extensive from infiltration of tubercle, or from the effects of Pneumonia, that it is impossible for the lung to contain air: or it may be partial, and limited. when such portions as are not affected may be capable of insupplation. Whilst the former sink in water - the latter may be buoyant enough - and of course the only difficulty will be when they are not so.

II. Objection. Cases in support of this are recorded by Berni. Remer. Capila. Daniel. Schenk and Oslander and Mr. Taylor in his Essay on the Guy's Hospital reports, instances the following —
 "The child was a twin of the female sex, weighing nearly five pounds; and probably nearly mature. The substance of the lung was healthy, of a deep Modena-red colour, with here and there patches of a lighter hue. There was no crepitation under the knife - nor was there any marked congestion, for no more blood followed the incision than is ordinarily witnessed in dividing the lungs of a foetus. The lungs were separately placed in water but they both sank with equal rapidity. Each

Lung was then cut into fifteen pieces; the pieces of the two lung having been kept separate were placed in water - and it was remarked that every portion sank rapidly to the bottom - and on compression below water, no air escaped. Yet the child had survived its birth twenty four hours." A similar case is related by Schenk, where an infant lived four days, and cried several times, whole lung sank to the bottom of the vessel. We have already noticed, that the lungs of the child, are very slowly dilated with air - and of course if the child is weak and puny - sleeps much and cries little - the total Specific Gravity of its lungs may be heavier than water. Hence, we see the use of the modern improvement in the investigation, viz. the division of the lungs into small portions, and then subjection to water - detecting if any be a portion sufficiently dilated: shewing respiration to have taken place.

On the other hand; supposing the lungs do float in water, there is still the question to decide - May it not be owing to Emphysema Putrefaction - or Inflation. The Emphysema may be formed in three different ways.

in all cases; for others again will always remain at the bottom. Presenting on their surface large vesicles, or blebs, containing air. This difference is to be accounted for on the ground - that those organs which contain the most blood in their textures will undergo most rapidly the process of decay, and consequently will contain the largest quantity of gas. Such lungs when firmly compressed in the hand and thrown in water will sink - being freed of their air.

3. The inflation. This may be regarded as the strongest argument against the Hydrostatic Test. The opinions of Medical Jurists are very much divided on this subject: some holding that the lungs can be made to sink in water when strongly squeezed if natural respiration has not been set up; while others contend, they will float. Amongst the former are Mr. Taylor and Mr. Jennings: the latter of whom says; that - "air introduced into the lungs by artificial insufflation, may be expelled by pressure, so that the lungs will sink in water" and on the other hand, that "after respiration the air cannot be completely expelled without breaking

up the structure of every part of the organ; any part however, not thus broken down, will continue to float." The only means of settling this question must be from actual experiment. In Case III reported in W. Taylor's Essay he allows, that "air from respiration (imperfect respiration?) may by very moderate pressure be forced out from divided portions of the organ" and he concludes his observation on Case II by saying that "there is no satisfactory means of distinguishing artificial inflation from feeble respiration." A case is also recorded by Schmitt, where the middle lobe of the right lung alone floated, and that imperfectly; but it sank again when forcibly compressed. The child had lived for four hours; and artificial inflation had not been used. There is one source of fallacy in the performance of artificial respiration worth noticing. The operator may be blowing air into the child's mouth, from direct contact with his own; but forgetting to remove tough-glairy mucus and froth from the passages, may fail entirely, or may distend the stomach and abdomen, from neglecting to raise the base of the

Carry on and to press it backwards against the Spinal Column. With a view to satisfy my own mind but more particularly for this Essay I performed several experiments.

Case I A well developed male child at the 8th month, still born - perfectly well preserved and weighing seven pounds and a half. I opened the trachea and inflated the lungs. The heart and lungs when thrown into water floated very well. The different lobes and different sections of the lungs were then tried and with a like result. Strong pressure was next employed and yet, although from the force employed they were torn into shreds they still floated at the surface of the vessel.

Case II. Was a child at the full time which had been operated on for Craniotomy by Dr. Moir. for contraction of the maternal passages. The body was perfectly fresh and well formed. The same process was gone through as detailed above and a like result obtained. I could not cause the lungs or portions of them however disintegrated in texture, to sink in water.

From the above data, I would conclude - that we cannot decide definitely as far as this test is concerned between lungs naturally and artificially inflated. Perhaps the former will require a greater amount of disorganization of their texture to cause their sinking than the latter. And to decide the question we should require a standard of comparison for our guidance. In fact it resolves itself into a question of degree. If pressure be of any use it must be in conditions of the lungs intermediate between the two extremes of imperfect and complete distension. I mean for example - the lungs are buoyant but pressure which does not disorganize them causes them to sink.

II Did the child breathe, before - during or
 _____ after delivery. _____

It is possible that the child may breathe whilst still in the uterus - Cases are even mentioned where the child has been heard to cry in utero. The infant may respire before its separation from the mother when the mouth is protruding at the orifice of the vagina: and I have myself observed in breech presentations,

when the head was delayed, and I required to assist the process: my fingers placed in the child's mouth felt a spasmodic action of the chest and of the muscles of the neck. The respiration in every case will be more or less imperfect. yet we cannot determine the matter without taking the other organs and parts of the body into consideration. Of these the state of the circulation is the most important. Next the umbilical cord and the skin - as well as certain indications drawn from the state of the stomach - bladder and intestines. I propose considering the three first indications under a different head. and in the meantime the state of the stomach bladder and intestines may be considered.

If milk or other farinaceous food be obtained from the stomach - the child must have been born living, and survived its birth some time. The starchy matter will strike a deep blue on the addition of the Tincture of Iodine.

The intestines afford little evidence on this head. It is stated that the bowels of mature still born children, are usually found filled with feces; and the greater part of it is not expelled.

during labour. Hence it is surmised that the chief reason for believing that the child was born alive on this ground - would be the complete expulsion of the foeces. All this is of very little importance. With like reasoning an empty state of the bladder is looked upon as a sign that the child had survived its birth: but nothing can be more erroneous than this.

III For how long did the child survive its birth.

There are certain foetal appendages that are not essential to its extra-uterine life; and according to the well known law of nature - that whatever is not necessary to the life and well being of the body becomes disintegrated and removed, or more or less absorbed.

Hence the shriveling of the umbilical cord - the obliteration of the ductus venosus or continuation of the umbilical vein to the inferior vena cava - the ductus arteriosus or connecting channel between the pulmonary artery and the concave part of the arch of the aorta - the foramen ovale - or opening between the two auricles of the heart. The period of closure differing in all

we derive from each, some data, for determining approximately, the length of time that the child has survived its birth.

1. Obliteration of the umbilical arteries and vein
 The obliteration of the vein takes place more slowly than the arteries. Towards the end of the first day, their coats are observed to be thickened, and their calibre diminished. This process gradually extends and by the third day it has reached their termination in the iliac. Hence, we conclude, that their obliteration proves, that the child has survived its birth, and their extent gives us some idea of the time. The obliteration of the umbilical vein, and ductus venosus, is not complete until the fifth day; and the comparison in this respect between the vein and the arteries will also aid our diagnosis. The changes which take place in the ductus arteriosus were more particularly described by Beant of Vienna; and for that reason it has been called the Vienna Test. — This tube is about the size of the pulmonary artery — an inch in length — and of a uniform cylindrical shape. According to Beant a few respirations cause it to shrink towards the aorta — thus destroying its cylindrical

form: If the child has survived for some hours or days, it regains its original form, and is uniformly contracted throughout. At the end of a week it has decreased from the size of a goose-quill to that of a crow-quill. About the eighth day it was obliterated in half the children examined; and by the ninth or tenth day in all of them. When this test was first proposed, great opinions were formed of its utility, but experience shews that it is of little value. Its examination however ought never to be overlooked.

Foramen Ovale. The time of closure of this valve is so variable, that little reliance can be placed upon it. Even in the adult it has been found comparatively open. I have seen two, and perhaps more cases of children living to the 10th and 14th day with imperfect closure of the foramen ovale. I cannot obtain any notes of the cases but I remember, that they presented a livid and turgid appearance of the whole surface. The extremities swelled greatly, the breathing became oppressive, and the dark-ness more pronounced all over the body. The nurses in the Hospital appeared to be familiar with this condition as the "Blue Disease"; and

stated that the infants would die within the fortnight; in both instances they were correct.

Changes in the umbilical Cord.

The size of the cord varies according to the quantity of gelatine it contains; as well as the turgidity of its vessels. It is rounded in form - firm in consistence - and of a bluish - white - glistening aspect. The cord is separated from the navel by a process of ulceration. The first change is a withering and contraction, which is never delayed beyond two days or three at the utmost. Usually at the end of the third day, it has undergone the necessary amount of shriveling and at the 5th day it is separated; leaving an ulcerated surface which is commonly healed by the eighth or ninth day. During the latter process an inflammatory circle is developed around the umbilicus; and its presence affords another proof that the child has lived: the only fallacy in connection with this is - that a few cases are recorded, where it has been absent in live-births - and present in still-born children.

Changes in the Skin. This consists in an isop-

iation of the epidermis, commencing on the abdomen and gradually extending over the body - the hands and feet being affected last. No definite time can be assigned for its commencement or completion. It is a vital action, and totally dissimilar from the separation of the cuticle arising from putrefaction. Ballard in his *Maladies des Enfants* speaks of the importance of this test of live-birth, and states, that it continues longest in feeble or delicate children

With all these facts before us as well as certain others which will be mentioned presently, we may be able to form a pretty accurate idea as to the double question *What the child survived its birth - and How long it had survived - which being answered the next enquiry is - What was the cause of Death?*

The child may have died from natural causes - from violence - or want of proper care.

1. Natural Causes. - The child may be the subject of congenital disease - or immature and unable to support its independent existence. The congenital affections are such as involve the three great tripods of the organism - the Lung.

the heart and the brain - and their bare enumeration will suffice. Of the lungs as being the more important we have 1st The effects of Pneumonia before birth as shown in the Hepatization of its substance 2nd Tubercle and 3rd Pulmonary Apoplexy and oedema.

The Brain and Spinal Cord, are liable to morbid accumulations of fluid either within their substance or within their membranes - interfering more or less with the functions of organic life; and causing the premature death of the child. Softening of the nervous matter is also seen; but it must be remembered that the brain of the child is more vascular and of softer consistence than that of the adult.

We have already considered the many dangers that threaten the child's life during the process of parturition; and their probable occurrence will be borne in mind when everything fails to elucidate the cause of death. It need not be said that proofs of respiration having taken place are essential before we can ascribe the death of the foetus to natural causes.

2. Violence... This question may be decided at once in cases where the head has been separated from the body or the neck dislocated. Evident signs of deep puncture over vital organs, as the heart or brain. and well marked traces of strangulation. On the other hand great care may have been taken by the murderer to leave no mark of his work on the little one. A large needle or wire may have been used to puncture the heart and all trace of its course obliterated.

A story is told in the *Causes Célèbres* of a diabolical French midwife who used to despatch her victims by thrusting a large needle into the fontanelle as soon as it presented. A clumsy method of destroying the infant is mentioned by Foderic, viz. crushing the head of the child between a bucket or the like and the thighs when it falls the outlet.

Suppocation. I have already mentioned several ways in which this might happen to the new born infant. Of still more importance because of the difficulty of the matter is the question of Overlying.

A case that came under my observation will illustrate the subject.

A young unmarried woman possessed of a fine

healthy child four days old; fell asleep about mid-day, after the nurse had made things comfortable - having her infant in her arms. She had not slept long when she awakened with a shriek, that called to her bed-side all the well-patients in the ward. She was holding her infant in her arms apparently quite lifeless, and crying piteously, and accusing herself of its death. When called I found the child, still-warm - face greatly congested - eyes prominent and glassy - lips deep-blue colour, mouth partially open and the tongue protruding. The hands were firmly clenched so that I could not undo them. Every means proved unavailing to restore animation. A woman who occupied the adjoining bed affirmed, that she saw the child at its mother's breast not half an hour before; and that she had not heard it crying since then. Careful examination into the whole matter, by proper authority, proved, that it was such a case, as might happen at any time, under the circumstances - an accident. A subject of some acuteness is where a child is found in a privy, and the jurist has to decide whether it has been thrown there willingly or

through accident. Instances of mothers having been delivered while at stool are mentioned by Mr. Latham in the London Medical Reports: as also by some German writers: and as might be supposed they all happened in women who had borne children previously. If it occurred unwittingly; perhaps the cord would be ruptured; but the most certain indication would be — the absence of respiratory sign or its imperfect accomplishment: whereas its complete fulfilment would furnish strong proof to the contrary.

Strangulation - The child may be strangled in the birth by the pressure of the os uteri or the twisting of the cord around the neck - but its traces are not so evident as are those inflicted by the hand of the murderer. Should examination declare the presence of respiration, the case will be decided at once more especially if echymoses corresponding to the fingers are observable.

Fracture of the Skull. One form in which this might occur has engaged our attention previously; and no difference will exist in those brought about by willful violence, except in

those rare cases where unwonted Severity has been used; and the bones of the face as well as of the Skull are fractured.

Fracture and dislocation of the Neck.

As before explained this may occur when the breech of the Child presents, and the head lingering in the passage: the Mother Seizes hold of the body and by using great force which must of course act in a doubling and twisting of the neck of the child and so destroy it in this way. It is always a criminal Sign,

Omission of Proper Care.

The removal of the infant from its State of supination when born, and the necessity of tying the umbilical cord have been shewn previously; whilst its protection from cold and the administration of proper aliment (which must be taken together) remain to be considered.

1. Exposure to cold &c. This form of death is denoted by pallor of the Surface, with congestion of the internal parts: whilst death from starvation allowing of course that the child had survived its birth some time, by more or less emaciation and an empty condition of the whole

alimentary canal. The place where the child is found - the attitude of the body - the matters adjacent to it - such as instruments of violence - blood and the like - mud in the mouth and nostrils - existence of footmarks - are all to be noted. Such cases are so difficult of proof even when marks of violence are detected; that a verdict of Willful Murder is seldom returned by the Jury. To complete this part of the Subject the question of death by drowning and poisoning remain - but the consideration of either of them would demand a separate Treatise.

Examination of the Mother.

After recent delivery at or near the full time; the patient labours under nervous shock - the eye is slightly sunken and surrounded by a dark or purplish coloured line. The skin is pale generally, especially the face - rather warmer than usual and covered with moisture of a peculiar somewhat acid smell. The breasts are full and lactiferous fluid exudes on pressure. There is a dark areola around the nipple. The abdomen is soft and lax, and bright whitish and reddish lines traverse its surface in

various directions: from the rupture of the subjacent muscular fibres. A dark line is described running from the pubis to the umbilicus with a fissure in its centre. This appearance I have only observed once, although I have searched for it in upwards of one hundred cases. In the case I refer to, the woman was of a very dark complexion and had pigment deposited on other parts of the body.

The uterus may be felt through the abdominal wall extending as high as the umbilical curve, large and voluminous, contracting and expanding under pressure. The pulse is full and undulating. The external organs of generation are in a relaxed and bruised state - tender to the touch - whilst a discharge of serous fluid mingled with blood proceeds from them of a peculiar acid odour. Clots of blood are sometimes seen. The anterior part of the perineum is a little torn or lacerated from distension. Milk is generally secreted about the third day. I made several observations on this head and the above was the time of its appearance in the majority. In one of seventeen (this was the extent of my experiment) cases I met with one exceptional case

in a multiparous woman who was enabled to suck-
le her infant a few hours after its birth.

If the examination be made at the end of ten
or twelve days the State of the parts as described
above will scarcely be seen. The lochia usually
continues from 15 to 35 days: but in a shorter
time are with difficulty distinguished from other
vaginal discharges. The wrinkled and relaxed
state of the abdomen is the only persistent external
mark: although it will not indicate recent par-
turation but merely that the woman had had
children. The existence of milk in the breasts
and the dark areola around the nipple are not
always due to pregnancy, as the breast of the vir-
gin and of the aged female past the child-
bearing epoch, have afforded this fluid on the
stimulus of suction: and the areola has often
been due to the excitement caused by disease of
the ovaries. The patulous and relaxed state of
the os uteri may guide us somewhat.

The Medical Jurist having investigated the
case thus far is now expected to give his state-
ment of the matter. Perhaps this is the first
time that such an inquiry has fallen to his

41.
care; and all the more on that account
does he seek to take advantage of every fact;
and to scan with jealous care the many
probabilities to which they give rise.

With an acknowledgement of the authorities
that I have consulted, I now take leave of
my Essay and submit it to the scrutiny of
my Teachers.

1. Professor Traill's Lectures and Manual.
2. Guy's Forensic Medicine
3. Hutchinlow on Infantheide
4. Wharton & Stille's Med. Jurisprudence
5. Tyler Smith's Midwifery
6. Professor Simpson's Contributions -

I have made use of other Books; but their
names will be found where quoted -

George Bowie.



M

March 1860