INFANTS FOUND DEAD.

To the Editor of THE LANCET.

SIR,—I beg to enclose the following remarks upon the medical evidence in suspected infanticide, illustrated by some cases which have recently fallen under my own observation. I remain, Sir, your obedient servant,

R. H. SEMPLE.

Islington, March 27, 1843.

CASE I.

On Tuesday, Dec. 6, 1842, I examined the body of a female infant which had been found wrapped up in some rags. There were no marks of violence on any part of the surface, but the cuticle was detached in many places by incipient putrefaction. The hair and nails were fully formed. The umbilical cord was sixteen inches long, not tied, but apparently torn. There was no meconium flowing from the anus. The body weighed 3 lbs 5 oz.; it measured sixteen inches and a half in length, ten inches being above the navel, and six inches and a half below it. It was, therefore, evident that this infant was not born at the full period of gestation, since in full-grown children the average length is from nineteen to twenty inches, the weight from five to eight pounds, and the position of the navel-string is in the centre of the body, or nearly so. As in this case, however, the foetus was of about eight months' growth, it might have been born alive.

The chest was examined, and the lungs were found to occupy only a small portion of the cavity. The heart and lungs were taken out together and immersed in water of the temperature of the atmosphere. They all sunk to the bottom. Each lung was then immersed separately in water, and each likewise sunk. On examining the heart, the foramen ovale and the ductus arteriosus were both found open. There is, therefore, no doubt whatever that this infant was still-born, though I do not place any reliance upon the open state of the foramen ovale and the ductus arteriosus, as both those apertures may be patent in cases where the infant has been born alive, and may not be closed for some days, or even weeks, after birth. Taken in conjunction, however, with the uninflated condition of the lungs, it is certain that the blood never circulated, and the lungs never performed the function of respiration, and consequently that the child never lived. This case also deserves notice, inasmuch as it proves that although putrefaction had commenced, yet the lungs sunk in water; and I would direct particular attention to this fact, because the existence of putrefaction is too often adduced to disprove the validity of the hydrostatic test.

CASE II.

On the 13th February, 1843, I examined

the body of a female infant which had been found in a field wrapped up in some coarse linen; it was apparently full-grown; there were no marks of violence except a slight appearance of lividity over the os frontis. The umbilical cord was three inches and a half in length, cut, but not tied. Meconium was flowing from the anus. The weight of this infant was 6 lbs 11 ozs; the length was twenty inches and a half, ten inches and a half below the umbilicus, and ten above it. The weight and measurement are those of a child born at the full period of gestation. The eyes were sunk. On opening the chest the lungs were found to fill the cavity. The heart and lungs were removed together, and plunged into water; they all floated upon the surface. Each lung was then removed separately and plunged into water, and each likewise floated. The lungs were then cut into pieces, and each piece floated; every part of the lung crepitated. There was no appearance of putrefaction on any part of the body. The heart was then examined, and the foramen ovale was found completely closed; the ductus arteriosus was also closed. The heart contained a small quantity of blood, which was fluid. The other viscera were healthy. On examining the head a bruise was found upon the os frontis beneath the livid mark seen externally; this bruise was of about the size of a half-crown, and there was a patch of coagulum on the frontal bone corresponding with the bruised appearance on the scalp. On the surface of the left parietal bone there was also a larger patch of coagulum of a gelatinous appearance, and of the colour of blood. There was no fracture of any of the cranial bones. The brain presented no unusual appearance.

In this case there is no doubt whatever that the infant was born alive, and the most probable cause of death is to be found in the injuries observed upon the head. It is quite impossible, however, to say with certainty that death was owing to this cause, for the existence of such injuries may be compatible with life. How these injuries were produced, it is also difficult to determine, whether by the passage of the head during a difficult labour, by an accidental fall, or by intentional violence. I do not think the first a satisfactory cause, for the peculiar mobility of the foetal cranial bones appears to render such an occurrence impossible, and if the head were compressed and an apoplectic state thereby produced, the lividity would be general, not local as in the present case. Besides, if the infant were born apoplectic, it is not probable that the lungs would have performed their function. The injuries must, therefore, have been the results of accident or of violence, but in the absence of any circumstantial evidence it is impossible to determine which.

CASE III.

On the 20th of March, 1843, I examined the body of a male infant, apparently born at the full period of gestation, but thin and puny. It had been found in the New River, wrapped up in an old handkerchief, with a large brick attached to it by a cord. There were no marks of violence on any part of the body, no appearance of ligature round the neck, there was no lividity, nor any symptom of putrefaction. The tongue was not protruded, the eyes were sunk, and the scleroticæ of the usual colour. The navel-string was not tied, and about four inches in length; there was no meconium flowing from the anus. Owing to unavoidable circumstances this body was not weighed or measured.

On removing the sternum the lungs were found to occupy only a part of the cavity of the chest, and were of a dark colour, resembling liver. Nevertheless, when removed from the body, they floated upon the surface of water, and when compressed they crepitated in every part. The heart presented no unusual appearance, and contained a small quantity of blood. The stomach was empty, and its mucous membrane of a pale colour. The intestines and other organs were healthy. All the organs of the body contained the usual quantity of blood. There were no marks of extravasation or congestion in the head or brain.

In this case there can be little doubt that the infant lived, but it is wholly impossible, from the post-mortem appearances alone, to form any decided opinion as to the cause of its death. Nearly all the evidence is of a negative character. That it did not die from hæmorrhage of the umbilical cord is proved by the fact, that the organs of the body contained their usual quantity of blood; that death was not the result of asphyxia from drowning, ligature round the neck, or suffocation, may be inferred from the absence of all appearances leading to such a conclusion; there was no appearance of poisoning nor any symptoms of natural disease. My own opinion is, that it lived only a short time, an inference which I draw from the partial inflation of the lungs; and that it died from natural debility, or, perhaps, from inattention.

CASE IV.

On the 23rd of March, 1843, I examined the body of a male infant, recently born, and apparently full grown. It had been left wrapped up in some rags in a partially inhabited house, but the person who left it had escaped. The meconium was flowing abundantly, and the surface of the body was smeared in various parts by that fluid. The navel-string was five inches long, not tied, but cut in an oblique direction; it was beginning to desiccate. The most pro-

minent appearance observable in this body was the remarkable lividity of the whole of the head and face, which were of a purple colour, approaching almost to black; there was no mark of a ligature round the neck. The tongue was of a dark colour, and protruded beyond the lips; some blood of a thin consistence was flowing from the nostrils; the eyes were protruded and bloodshot. Putrefaction had commenced about the trunk, and especially about the back and abdomen, which were of a greenish colour, very distinct from the colour of the head and face. The cuticle was detached from the subjacent skin in various parts owing to putrefaction. The nails were perfectly formed. The weight of the body was six pounds; the length was twenty inches and a half; eleven inches being above the umbilicus, and nine inches and a half below it. The abdomen was distended with gas, which escaped on making an incision into the cavity; this gas by its odour appeared to be sulphuretted hydrogen produced by putrefaction. There was a considerable quantity of fat beneath the skin.

Head.—On separating the scalp from the skull, the intervening space was found filled with an enormous quantity of extravasated blood, part being semi-coagulated and of a tarry consistence, and part being thin, fluid, and serous. This effusion was not confined to any particular part, but spread over the whole surface of the cranium. The cranial bones presented the usual appearances, and were not fractured in any part. The brain was excessively congested, the veins being filled with blood.

Chest.—On removing the sternum the lungs were seen filling the cavity of the chest; they were of a light pink colour. The lungs and heart were removed together and plunged into water of the temperature of the atmosphere; they floated upon the surface. Each lung was then plunged separately into the water, and each likewise floated, and having been divided into pieces each piece floated. The lungs were not in a state of putrefaction; and on being compressed they crepitated throughout. The heart was healthy, and contained very little blood. The foramen ovale was closed completely, but the ductus arteriosus was open.

Abdomen.—The liver was of a very dark colour, with vesicles containing gas upon its surface; it was in a state of incipient putrefaction. The stomach was empty, and its inner surface was congested. The intestines were healthy, and the large intestines were filled with meconium. The bladder was empty.

The general appearance, size, weight, and measurement of this infant prove that it was born at the full period of gestation, and that it lived after its birth is evident from the following circumstances:—

1. The lungs were inflated with air and floated upon the surface of water, although the putrefactive process, which had commenced in some parts of the body, had not reached those organs.

2. The foramen ovale was closed.

3. The meconium was flowing from the anus.

4. Blood was extravasated between the scalp and the skull.

That it lived some hours after birth may be inferred from the appearance of the umbilical cord, which was beginning to desiccate.

It can hardly be doubted that it came to its death by unfair means, an opinion which is derived from the appearances observed about the head and face. The remarkable lividity of those parts, the protrusion of the tongue, the prominent bloodshot eyes, the extravasation beneath the scalp, and the congested state of the vessels of the brain, all concur in indicating death by asphyxia.

I shall now offer a few remarks upon the tests which are employed to determine the question whether an infant has been born alive, and upon the causes of death in newly born children.

The Hydrostatic Test.—This is one on which the greatest reliance may be placed, notwithstanding the objections which have been advanced against it by some writers. The principal objection is, that the lungs may float from putrefaction as well as from the presence of respired air; but I think it hardly possible for any person who has been in the habit of observing the healthy and morbid conditions of the body to confound a healthy with a putrid lung. Besides, it is a well-known fact that the lungs resist putrefaction longer than any other parts of the body; and by reference to Case I. in this paper it will be seen that although putrefaction had commenced in other parts, the lungs sunk in water. In a case of an abortion which I examined the summer before last, the lungs sunk in water, although the decomposition of all the other parts was very far advanced. It has also been objected that the lungs may float in consequence of artificial inflation, which must be a very rare occurrence; from the presence of emphysema, which, however, can be readily distinguished; and from uterine respiration, which is impossible.

The Foramen Ovale.—When this aperture is found closed it affords decisive evidence that the child was born alive, because its patent condition is indispensable to the foetal circulation; but when open, it must not be concluded that the child was still-born, because it may remain unclosed for many days or even weeks after birth.

The Ductus Arteriosus.—The same remarks apply to this canal as to the opening called the foramen ovale; its obliteration

proves that the infant lived, but its open condition does not prove the contrary.

The Meconium.—This substance is expelled soon after birth in consequence of the expansion of the lungs, which press upon the diaphragm and abdomen, and thus discharge the contents of the intestines. Where the meconium is found flowing from the anus there is, therefore, strong presumption that the child has lived after birth, though taken singly, this test is not of much importance, because, as it has been remarked, the meconium may be expelled in breech presentations, even although the child may be born dead; and Dr. Denman met with a case in which the meconium was discharged upwards of thirty hours before the child was born.

The Presence of Extravasated Blood.—This can only exist in cases where the infant has lived, because it is impossible to produce such an effect in a dead body.

The Causes of Death in Newly-born Children are very numerous, and cannot often be determined with accuracy by mere post-mortem examination. The tenacity of life exhibited by some is quite as remarkable as the facility with which the vital principle is extinguished in others; and a knowledge of this circumstance should render the medical jurist extremely cautious in giving his evidence in cases involving the guilt of any party. As an instance of the difficulty of destroying life in a new-born infant, I would refer to the following case which came under my notice about two years ago:—A female servant in a respectable family residing in Islington, was delivered of a child without the knowledge of the rest of the inmates of the house. It appeared by subsequent investigation that she took the infant to the privy in the garden and deposited it there, and not satisfied with merely immersing it, she actually endeavoured by a pole to press it beneath the surface, and thus effectually to conceal her shame by destroying her infant. It proved, however, that her efforts were fruitless, for one of the family having occasion to go into the garden was alarmed by what appeared to be the cries of an infant, and communicated her suspicions to the rest of the family. My uncle, Mr. W. Semple, was immediately sent for, and he succeeded after great exertions in extricating the infant from its perilous situation. The child lived many days after birth, and when it died its death could not clearly be traced to the efforts made to destroy it. The woman, however, was tried at the Old Bailey for concealment of the birth, and very justly found guilty, and was sentenced to ten years' transportation. Another case, of an opposite character, occurred in the Islington Workhouse, and has already appeared in the pages of THE LANCET. In that case a woman was delivered of an illegitimate child, which lived for some days, and exhibited no

symptoms of disease, until one afternoon it was found lying dead by the mother's side. After a careful examination of this infant, it appeared that there was no reason to suppose that it died by violence, and the coroner's jury very properly returned a verdict of "Natural death."

Death from hæmorrhage in consequence of neglect in tying the navel-string is, I should imagine, a very rare occurrence, although I am aware there are a few such cases on record. The appearances in such a case are sufficiently distinct, and consist in the presence of a large quantity of blood upon or near the body, a waxy, pale appearance of the surface, and a blanched, exsanguinated state of the internal organs.

Death from exposure to cold can with difficulty be determined by post-mortem examination, and it can only be inferred in most cases from the absence of other symptoms. That this is a very common cause of death can hardly be doubted; and history informs us that in Greece, especially at Athens and Sparta, newly-born infants were purposely deprived of life in this manner; and Aristotle and Plato did not hesitate to commend this inhuman practice, which, to our deep disgrace be it spoken, appears to prevail to an enormous extent in our own Christian country.

Death from wounds or blows, from asphyxia either by drowning, strangling, or suffocation, from the inhalation of noxious gases, or from poison, may be determined with considerable certainty, and it is quite unnecessary to dwell upon the peculiar appearances observable in each of these cases, as they are well known to all medical practitioners.

THE AERATION OF THE FŒTAL BLOOD.

To the Editor of THE LANCET.

SIR,—After the correspondence which has already filled so much of your valuable space respecting the functions of the spleen and placenta, I will condense my remarks on this subject within the smallest possible compass.

Let us look upon the human ovum, when disengaged from the Fallopian tubes, as being in much the same situation as an egg when excluded from the cloaca of an oviparous animal; both require aeration, but the means by which it is effected are different. During the period of incubation the egg is surrounded by the atmosphere, and the arterialisation of its nascent blood is carried on in the allantois by the imbibition of air through the porous shell. The ovum, on the contrary, is inclosed in membranes, and surrounded by the thick structure of the uterus; it is thus deprived of all contact with the external air. Some substi-

tute for this must be provided, and it evidently is by the placenta.

Let us now compare the placenta with the lungs. In either organ we discover two sets of vessels; the one set conveying a fluid which exerts a certain action upon the blood as it circulates through the other set, though without any direct inosculation of the two sets.

Thus, in the lungs, in close juxta-position with the extremities of the bronchi, which convey the air inhaled by the expanding chest, are the minute extreme ramifications of the pulmonary arteries terminating in the origins of the pulmonary veins. In this minutely divided part of the respiratory apparatus the blood undergoes the process of aeration, not by the union of the arteries and bronchi, but by the permeability to gases of the delicate coats of the ultimate sanguiferous and aeriferous canals here placed in such close contact. Now, the disposition of the placental vessels is precisely similar. I will not swell this communication by the recital of experiments, or by the citation of authorities. The nature of the anatomical facts on which this theory is based will occur to every reader of *THE LANCET*.

Considering, then, the singular analogy observable between the arrangement of the umbilical vessels with regard to the uterine artery, and the disposition of the pulmonary vessels with respect to the bronchi, I cannot avoid the conclusion that in the placenta we are presented with that substitute for direct atmospheric influence which the inclosed state of the foetus demanded. Upon this hypothesis, and adopting the theory of Liebig, the dis-oxygenated blood of the umbilical arteries arriving at the extremities of those vessels which are in close juxta-position and parallelism with the minute rami of the uterine arteries, is aerated by means of the per-oxydised corpuscles of the maternal fluid, depriving them of their superabundant oxygen; this, permeating the thin coats of the two sets of vessels (as air does in the lungs, from the bronchi to the arteries), renovates the foetal blood, which thence passes directly into the umbilical vein (as in the lungs, from the pulmonary artery to the vein), and returns into the foetal circulation. It would be easy to enlarge upon many of the heads which I have merely touched upon, but I am fearful of extending this to too great a length. I have the honour to remain, Sir, your obedient servant,

ELE.

Dorset-street, Portman-square,
March 25, 1843.

M. PITSCHT, of Baden, asserts that he has cured incontinence of urine in patients of either sex by small doses of strychnine. To insure success, however, it is necessary that the bowels should be cleared before commencing the use of this remedy.