pyriform sac being attached to the apex of the next.

Development of the Ova of Medusæ.—It is a question whether the ovum is at first provided with an external membrane or chorion; it is probable, from a consideration of the changes which it subsequently undergoes, that such is not the case, but that this membrane becomes developed at a later period. In the first instance, Wagner has observed, that the ovum becomes slightly lengthened, and indented at a point which is constant, on one side; this indentation gradually becomes a cleft, which divides the ovum into two equal halves; other fissures are then formed, which subdivide the ovum at first into four portions, then into numerous smaller parts, and, eventually, into a great number of minute granules; the vitelline granules next assume a radiated form, leaving an unoccupied space in the centre, and at the same time an external epithelium, furnished with cilia, is produced, and the ovum commences a rotatory movement. The next change that occurs, is an alteration in colour from violet to yellow, the assumption of an elongated oval shape, and the formation of a slight oral depression at their great extremity. It is in this state that they quit the marsupium, and here we are forcibly reminded of the form and condition of the lower infusoria; in a short time a circular ring begins to be seen around the oval extremity, and short processes, furnished with cilia, are produced from the ring, giving to this stage of the development a close resemblance to the rotiferous infusory. In the next place, the processes developed around the mouth become elongated into eight tentacula, provided with cilia; the mouth communicates with the internal intestinal canal, and the entire embryo has taken on the characters of a polypus, feeding on infusory animalcules and minute forms of its own species. In this state it is probable that the young medusæ sink to the bottom of the sea in shallow situations, and bury themselves in the mud and sand during the winter season, and either continue their growth there, or rise in the spring to complete their adult form. Siebold kept some of these embryos through the winter, but failed in procuring their complete development, a circumstance which cannot be wondered at, when it is recollected that the tadpole is unable to assume its perfect condition in captivity.

In one genus of *Acalepha*, fixed gemmation takes place, the newly-formed gemmæ assuming the perfect form of the parent, but remaining connected with her and with each other.

ECHINODERMATA.—The echinodermata are completely dioecious, possessing distinct male and female organs, and losing altogether the power of non-sexual reproduction by fission and generation. In the *Asterias*, a ramified digestive sac, with two ramified gene-

rative organs, are contained in each ray, and open by two distinct foramina at its base; in the generative sacs of some individuals a whitish granular substance is found in the spring, and spermatozoa in the summer and autumn; in others, ova are discovered in great numbers in the breeding season; in the *Encrinus* and *Comatula*, the generative sacs are more subdivided, and present a lower condition; they are situated in the radiating arms; in the *Echini*, the generative organs are attached to that portion of the internal surface of the shell which is opposite to the mouth; in the echinus *esculentus*, five lobulated sacs are placed around the anus, which are either ovaries or testes, according to the sex of the individual; they open upon the exterior by means of pores in the shell in this situation; these pores are distinctly seen in the fossil species. If we were to suppose the shell of the echinus to be softened, and the animal drawn out into a vermiform figure, we should then have the organisation of the worm-like *Holothuria*; in this genus the generative organ is a single system of ramified tubes, opening near the mouth of the creature; the remarkable coecal pouch connected with this apparatus, and which has hitherto been considered a rudimentary testis, has been proved, by the recent careful observation of Rudolph Wagner, to contain no vestige of spermatozoa at any period. It is probably intended to add some substance to the ovum previously to its expulsion; in the *Sipunculus* there are two organs, which are neither ramified nor divided, and are, therefore, simpler than the ramified organ of the holothuria; it is probably dioecious, but new observations are required to ascertain whether, in some individuals, they may contain spermatozoa. At this very early stage of our inquiry into the condition of the generative organs in the lower animals, we cannot but feel some degree of astonishment in discovering distinct sexes, organs of generation as complete as are to be found in many of the higher classes, and that remarkable process in the medusæ which assimilates them in their mode of reproduction with the marsupial mammifera.

PATHOLOGY OF THE BRAIN IN AN IDIOT FROM INFANCY.

To the Editor of THE LANCET.

SIR:—Will you oblige me by an insertion of the subjoined case in the columns of your valuable periodical? I am, Sir, your obedient servant,

GEORGE LOWTHER, M.R.C.S.
Kingston-upon-Hull,
April 25, 1840.

On the 27th of December, 1839, I was requested to attend Sarah Oliver Foster, a girl of delicate frame, tall in stature, aged

12 years, and idiotic from infancy. I found her affected with functional disturbance of the chylopoietic system, as indicated by a diarrhoea of several days' duration, which was attended with its usual concomitants, viz., irritability, an accelerated circulation, thirst, disordered digestion, a scanty secretion of urine, and considerable debility. Hitherto she had had nothing administered for the purpose of restraining intestinal action. I ordered a mild thebaic, combined with a moderate astringent, to be given every third hour; farinaceous food and quietude.

28. Intestinal evacuations diminished, and a decided amelioration, in every respect, in the condition of the patient. To continue the mixture as before.

29. Diarrhoea nearly restrained; there is, notwithstanding, great prostration, and a marked inattention to surrounding objects, probably symptomatic of the supervention of cerebral disease. To have a gentle alkaline stimulus, combined with a diuretic, administered every three hours, and an alterative powder at night.

30. Upon my arrival about noon this day I found my patient in *articulo mortis*. An inquiry elicited that a change had occurred about five in the morning. Symptoms of cerebral effusion had slowly supervened, she became gradually comatose, and at about three minutes after my arrival expired.

Autopsy Twenty-four Hours after Death.

The external aspect of the body presented little, if any emaciation. Upon raising the lid of the left eye, which had been strabismic from birth, I perceived that death had produced no change in its obliquity, the pupil was still directed towards the external canthus. The scalp having been reflected anteriorly and posteriorly, I proceeded to measure the denuded skull, which, in consequence of a considerable contraction in its transverse diameter anteriorly, presented, when viewed at the vertex, a remarkable conformation, converging towards the forehead, as a pear does at its apex. The size of the skull, taken externally, is as under:—

Circumference parallel with the upper margin of the helices of the ears, 18 in., 4 lines;

Transverse breadth between each helix of ditto, 10 inches.

A transverse section of the cranium was now made three or four lines above the greater ala of the sphenoid bone, and the calvarium removed. The general aspect of the dura mater presented nothing remarkable, with the following pathological exception:—Protruding from each temporal region of the cerebrum appeared a globular distension of the dura mater, equal to a small orange in size, and sufficiently indicative, from the existing fluctuation, and particularly from the fluid which followed the use

of the saw, of a copious effusion of serum from the surface of the serous membrane. The meninges were then raised, and the brain exposed, serum flowing the while in profusion. Glancing at the brain *in situ*, it was readily perceived that the conformation of the cranium did not correspond with the external contour of the cerebrum. Occupying the site, and occasioned by the non-development of the lateral portions of the anterior lobes, comprising the temporal regions of the cerebrum, and equal in extent to rather more than one-third of each lobe, appeared cavities, readily accounting for the copious collection of serum within the recently-distended membranes. The convexity of the brain was lost, its general external appearance being flattened, blanched, and easily compressed. Preparations having been made for collecting the fluid, I now made a longitudinal incision into the superior part of the right hemisphere, extending from the frontal to the occipital region (fluid following the knife freely), and exposed—not the lateral ventricles, for, anatomically speaking, none existed, unless the entire interior of the brain might be deemed such—but one large cavity, its circumference being bounded by little more than the cineritious substance of the brain. A similar incision, accompanied with an equally abundant effusion, was then made through the left hemisphere, and both sides of the cerebrum compared. Precisely similar appearances presented. Each half of the brain, including both cortical and medullary substance, did not exceed an inch in thickness, and at the occipital region not more than four or five lines. Throughout its entire extent, the internal surface of each hemispherical cavity appeared smooth and shining, and showed not the slightest trace of organic lesion. The medulla oblongata having been divided midway, and the cerebrum and cerebellum removed, the weight of each brain was found to be as follows:—

Weight of cerebrum (drained), 16 ounces 6 drachms;

Ditto of cerebellum (ditto), 6 ounces;

Serum abstracted from the cavities of the hemispheres, 14 ounces;

Ditto from meninges, including loss during cranial trans-section, 6 ounces.

The longitudinal and transverse dimensions of the cranium are also subjoined; these are taken from the inner table:—

Central length from frontal to occipital region, 6 inches 2 lines;

Transverse breadth between the temporal bones, 4 inches 8 lines;

Ditto ditto, over the sphenoid alæ, 3 inches 6 lines.

With the exception of the vessels of the cerebellum, which were in a state of congestion, as seen by a section through its substance, the longitudinal, transverse, and other sinuses, with the various vessels con-

tained within the cranium, manifested a perfectly normal condition.

Remarks.—The patient was an only child, born of healthy parents, at the full period of utero-gestation, after a natural, but difficult and protracted labour. Animation was feeble for several hours immediately succeeding birth. On the third day the child was considerably convulsed; convulsions recurring at irregular intervals during the first two or three months. No lactation. The parents distinctly assert that they have never been accustomed to procure artificial sleep by medicine usually administered for that purpose. The child had nearly attained the 18th month before any indication of the existence of defective development in the cerebral organisation became fully apparent, or, in other words, before symptoms of idiocy were rendered no longer doubtful. The following are a few of the features peculiar to the child, which do not differ materially, as far as I am aware, from the common characteristics of idiots.

No indication of the effect of external impressions was perceptible until the age of two years, when the child began to articulate a few of the familiar words of infancy. Owing to a remarkable obtuseness of comprehension, great difficulty was experienced in the child's instruction. As a natural consequence, memory was defective; and these peculiarities, in addition to an indistinct articulation, continued during life. As a point in illustration, it is worthy of remark, that the child could not proceed further than the third figure in numerals, nor could she advance beyond the third letter of the alphabet. She was exceedingly passionate. Her susceptibility to the reception of external impressions, through the medium of the several senses, varied greatly in degree. The sense of hearing was singularly acute, as demonstrated by the delight occasioned by musical sounds, even when conveyed from a considerable distance. Taste, smell, and sight stood next in relative succession, and lastly that of touch. A curious circumstance is mentioned by the father, which, in this instance, would tend to denote a temporary absence of perception, no impression being transmitted through the sentient nerves. One evening, whilst seated near the fire, a hot cinder fell upon her stocking, and burnt through to her foot; a subsequent examination discovered that the burning ember had taken effect, but the child was unconscious of its presence, no impression having been transmitted to the sensorium! Like most idiots, whilst in a sitting posture she was incessantly in motion, moving the trunk to and fro; she slept soundly; was always dreadfully afraid of falling. Upon questioning the mother concerning the supposed cause of the child's mental imbecility, she stated, that when advanced in the fifth month of pregnancy, she

was greatly alarmed by a rat, which sprung from a closet in her apartment; this is the only information I could elicit. It may be proper to mention that a year prior to her death the child was attacked with epileptic convulsions, from which, in a few days, she gradually recovered.

The therapeutic history of the case is brief, but not altogether uninteresting. The case is clearly confirmatory of a pre-established fact, that disordered action existing in one part of the body may, in an exceedingly susceptible subject, terminate by metastasis, to a remote region, and produce fatal secondary disease. We have here an instance of prolonged chylopoietic derangement, conjoined with diarrhoea, great debility, a rapid circulation, and a delicate proneness to revulsional disease, occurring in an individual of peculiar physical constitution. The disadvantages attending the treatment under such circumstances, will appear at once obvious. Notwithstanding the mild form of the medicinal agents employed, and the gradual manner in which intestinal action was restrained, an accumulation of fluid within the cranium was the result. Here an important question suggests itself: suppose the diarrhoea had been allowed a critical termination, might a different result have been established? or might the tendency to cerebral effusion have been averted or diminished? Had the intestinal evacuations been permitted to cease spontaneously, it is not impossible that the transitional tendency might have been lessened; but when the combined nature of the exciting cause is considered in connection with that of the predisposing, and particularly the general irritability of the system, it could scarcely be expected that the constitutional disturbance would have settled down to the standard of health, exclusive of any cerebral effusion.

The pathological inquiry embraces many points of extreme importance. In the preceding remarks I have inferred, *a priori*, that extravasation was the immediate cause of death, an inference inseparable from a due consideration of that section of the inquiry. I will now endeavour to establish this conclusion upon the only legitimate principles of argument, viz., by means of induction.

In a late volume of *THE LANCET** I related a case of persistency of life, during an extensive disorganisation of the right half of the brain. A post-mortem examination showed that nearly two-thirds of one hemisphere were completely destroyed, the interior being simply a continuous cavity, coated with a thick purulent deposit, and containing an isolated, but properly organised tumour, of considerable magnitude. With the exception of a few ounces of fluid contained within its lateral ventricle, the left

hemisphere was perfectly normal. In this case I proved, from what I considered to be incontrovertible facts, that the individual's mental and physical capabilities (with the exception of an occasional epileptic attack) had remained unimpaired, notwithstanding this extensive organic lesion, and that the collection of serum within the left lateral ventricle was the proximate cause of death. The inference deduced from the narrated facts was this: "That disease in one hemisphere only is not incompatible with the continuance of physical or intellectual life; but if both are affected simultaneously vitality ceases."

Upon a comparison of the morbid appearances presented in each case, we shall discover an essential difference in their pathology. In the case just referred to, *one* hemisphere *only* is extensively destroyed; in the present case *both* would appear nearly obliterated; so that the inference drawn from the former case would appear to admit of considerable deviation, when applied to the facts recorded in the latter. From each, however, a similar conclusion may be deduced, as will be seen in the sequel.

In the autopsy to the present case, it is stated that the interior of each hemisphere appeared smooth and shining, and showed no trace of disorganisation, a circumstance, in my opinion, amply demonstrative that the non-development of structure was congenital. Strabismus is acknowledged to be symptomatic of ventricular effusion, an obliquity of the pupil existed from birth; hence it is fair to infer, that dropsy of one-half of the brain at least must have been also congenital. Possibly the defective organisation may be imagined to be merely the result of absorption, consequent upon chronic hydrocephalus; yet what are the facts? Only admit that organisation may have been arrested by the fright mentioned by the mother, and the opinion is strengthened by the absence of the lateral portions of the anterior lobes, and confirmed by the existence of infantile idiocy; facts entirely subversive of the supposition that the apparent defective development might be simply the result of structural absorption.

That physical existence was protracted during a period of twelve years, under circumstances highly unfavourable to its continuance, I have attempted to prove by the foregoing facts. It now remains to ascertain the immediate cause of death; and to what cause are we to ascribe the cessation of life? The principal morbid appearances were an accumulation of serum within the hemisphere and the dura mater on both sides. Congenital strabismus has been adduced to prove that dropsy of one hemisphere must have existed from birth; yet an obliquity of the eyeball is not an inseparable attendant upon chronic hydrocephalus, as many recorded cases sufficiently testify; and as the

internal condition of each hemisphere was pathologically the same, there is no reason to believe that an extravasation in both cerebral cavities may not have occurred simultaneously.

From a review of the preceding, the following conclusion may be drawn:—That meningeal effusion, as indicated by coma, immediately preceded death; that congenital non-development, with congenital effusion in each cerebral hemisphere, when combined with meningeal effusion on *both sides* of the brain, may become destructive to life, the former by operating as the predisposing, and the latter as the proximate cause of death.

Death, therefore, in both instances, would seem to be referrible to the same cause, viz., compression by extravasation, each hemisphere being affected simultaneously. The two cases are dissimilar *only* as it concerns their predisposing cause, inasmuch as a comparison clearly proves, that vitality is far less endangered by an arrest of organisation than by organic disease, confirming the pre-established principle, that an important difference may exist with reference to their relative agency upon life, between non-development of structure and structural disease.

The physiological and metaphysical departments comprise a wide field for inquiry. The subject has already extended a greater length than was anticipated, therefore several facts in my possession, illustrative of the effects of mental emotions upon the child *in utero*, shall be kept in reserve, as they may form a communication for some future occasion.

VIOLATION OF A CHILD.—Anne Hall, aged eleven months, was violated by a private soldier, named Andrew Hume. Examined by Mr. Kingsley, surgeon to the Templemore Fever Hospital and Dispensary, two or three days after the commission of the crime; the prisoner was found to have the penis small, and the glans slightly excoriated. "The whole of the external genitals (of the child) were found in a torn state, viz., the perineum very much so, as were also the labia minora, and adjoining mucous membrane of the labia majora and the clitoris; in fact, the whole of the vulva, or genital fissure, presented a large, lacerated wound, in a high state of inflammation: the child was in a state of collapse, and died a few hours after my visit, having survived the injuries inflicted on her, only thirty hours." On a post-mortem examination, the vagina was found "very much dilated, and longer than natural; its extremity was torn from its attachment to the neck of the womb posteriorly, leaving a large torn opening between the uterus and rectum directly into the cavity of the abdomen, where a quantity of bloody serum was effused".—*Dublin Medical Press*, April 22, 1840.