operation, is a formidable expedient; yet it would seem that many women who submitted to it have had a complete recovery, even when it was performed at the lapse of many hours after the uterus had been lacerated. The first well-authenticated case in which it was successful, is to be found in the third volume of the *Journ. de Med.* for 1768; the foetus was still born. You will find in the second volume of the *Pathol. Chirurg.*, the case of a woman who had been twice successfully operated on; the second time, the foetus continued to live for half an hour after its extraction from among the viscera. In the second volume of the *Quarterly Journal of Foreign Med.*, there is a case in which the operation proved successful to the parent, although it had not been performed for twelve hours after the accident. And, in the first Number of the *Edinb. Journ. of Med. Science*, p. 118, there is a fifth operation, by which both mother and child were saved. From the result of gastrotomy in these five cases, or at least operations, when the extraction of the foetus from among the abdominal viscera has not been attempted immediately after the accident, the preference must certainly be given to the section of the abdominal parietes; and the same practice must be adopted, when the foetus is ejected among the intestines, before the uterine aperture is sufficiently dilated to receive the hand of the practitioner, with a view to the operation of turning. In a case where a considerable quantity of blood, or *liquor amnii*, has been effused into the cavity of the abdomen, gastrotomy, by affording an outlet to these matters, will be attended with further advantages to the patient. Once more let me remind you that when this operation is thought necessary, it must be performed with as little delay as possible.

Where, after the removal of the foetus, a portion of intestine insinuates itself into the uterus, and where this organ has contracted so much that it cannot receive the hand to reduce the intestine, Pignatelli, the friend and favourite pupil of Ambrose Paré, recommended gastrotomy; and I think his recommendation must be acted on, for I see no other way by which, in such cases, the object of the practitioner can be attained. These, however, are desperate cases; and, generally, we may not be aware of the nature of the patient's complaint during life. Baudelocque relates a case, which, much to his credit, he does not believe himself, where one of his countrymen, three days after the accident, introduced his hand, armed with a bistoury, into the uterus, enlarged the rent, and reduced the intestine. But if any part of this statement be correct, the laceration must have been in the vagina, and not *in utero*. To prevent strangulation of the intestine by

the uterus, I would recommend that, after the delivery, the hand should be introduced and retained in this organ, until it is properly contracted.

Finally, as in a few females who recovered from rupture of the uterus, the like accident has recurred in their succeeding labour; it was first proposed in 1709, by Dr. Douglas of London, to extract the foetus by the feet in the subsequent labours of such individuals, to prevent the action of the uterus being violently excited. This I conceive to be a wise measure, and one which has since been successfully followed by Dr. Douglas, and other gentlemen; but if the head be far advanced through the brim before we are called, or the pelvis narrow, this practice cannot be adopted.

ON THE

ORGANIC MATERIALITY OF THE MIND;

The Immateriality of the Soul, and the Non-identity of the Two.

By G. D. DERMOTT, Esq.

BEFORE I commence this subject, it must be fully understood, (and, in fact, in the course of reading it will be clearly seen,) that my sentiments do not at all tally with those of Drs. Gall and Spurzheim.

I feel completely convinced, that the cortical part of the substance of the brain is only subservient to the medullary part, inasmuch as the former is the seat of birth to certain qualities, which afterwards become diffused or circulated through the medullary part of the brain, and even nervous system, and in which their effects become perfectly developed; hence it is the medullary part of the brain to which my observations refer, and which possesses all the distinguishing living properties peculiar to the brain, as living brain.

I know that there are certain masses or portions of the brain, individually possessing their peculiar properties or functions; thus there is one particular portion of the brain which is the region of perception, another the region of thought, another for memory, and another for judgment; for, we take away the cerebrum, and we take away at once the perception, thought, and memory; we take away the cerebellum, (without the cerebrum,) and we take away the judgment; this is a fact fully established by M. Flourens and Professor Rolando, because these actions (*mental*, as they are com-

monly called,) are nothing else than the *organic functions* of these several parts of the brain, as it is the peculiar living or organic function of the stomach to digest; for, by taking away the latter, we take away the function of digestion, and we should simply produce this effect, if we could do it without producing injury to the nervous or vascular systems, or the system at large, by breaking the harmony which must be naturally existing between the functions of the different viscera to constitute a perfect body.

It is in vain to state, that what I have now ventured to affirm is untrue, upon the strength of an assumption founded upon ignorance and prejudice, and frequently made—that the mental properties are totally different from the known properties, and all established ideas of matter. For our ideas are founded upon our knowledge of *dead* or *inorganic* matter, to which, and theology, the divines, and every sensible man not connected with our profession, should confine their speculations. On the contrary, the knowledge and pursuits of the properties of organic matter, or animal life, is a knowledge of itself; organic life having properties so totally different from inorganic matter, that our ideas as to the nature of the former, must not be at all fashioned by those as to the nature of the latter; hence, what is demonstration to a physiologist, cannot be conceived to be clear demonstration to a divine, unless that divine has an elaborate and an unnecessary degree of insight into the nature of physiology: for instance, who would suppose *a priori*, judging merely from the properties of *dead* matter, that it could be the peculiar living property of the stomach to carry on the incomprehensible function of digestion; for the intestinal canal to be one of the chief means of making blood; for the arteries to be *living* tubes, and for these living tubes to be circulating a living fluid, to be producing equally incomprehensible effects on every part of the body; and again, for the nerves to be possessed with peculiar sensibilities and living powers, so beautifully shown by Bell and Magendie; and again, for the brain to be possessing the organic functions, which have hitherto been invariably denominated mental. If further proof were wanting, than the actual abstraction of the certain portions of the brain, as to the identity of function of certain parts of the brain, I might only observe, that the cerebral, or mental functions, are, by every person, seen to be as intimately associated with the system at large as the organic function of any other viscus. If we derange the stomach, the lungs may be sympathetically affected by the influence of the par vagum; if we derange the lungs, the stomach may be reversely affected; if we lessen the nervous energy of the system,

all the animal functions are correspondently debilitated; and if we unnaturally excite the sanguineous system, the animal functions are correspondently deranged. I need not say how much these effects are seen in the brain; now, by exciting the circulation in the brain, the nervous energy* of the brain is invigorated, i. e. its functions, or mental powers are quickened; if the velocity of the circulation be increased to a greater degree, then coma, or paralysis of the brain, will be produced by the mechanical pressure of the dilated vessels on the substance of the brain, or the effusion of serum: on the contrary, if the natural strength of the circulation is materially lessened, and along with that, as a necessary consequence, the energy of the nervous system, the arteries of the brain, along with all the other viscera, become proportionally weakened; the mind becomes imbecile, the necessary harmony between the functions of the different parts of the brain, probably becomes perverted; the thoughts falter with the tongue, nay, more, if animal depression still goes on, inaction supervenes, and the brain, as a component part of the animal system, becomes inactive, and syncope is succeeded by death: the mind is gone—gone with the power of digestion—with the power of chylicification—with the power of sanguification—with the power of respiration, &c., because the proximate cause was itself the organic action of the brain, and properties inherent in their different portions, as living parts.

But to take up the argument on fresh grounds, it is undoubtedly the peculiar living property of the nerves to feel, i. e. a property of organic matter; and by the distribution of which through the different parts of the body, every part is possessed with sensation, and carries on its just actions, and by which peculiar, living, material property existing in the nerves, all sensations and impressions are conveyed from the different parts of the body to the brain, this (which is a property of *matter* it must be understood) produces *perception* of the sensation—it *excites* the action of perception in some part of the brain; now this action of perception must be an *action of living matter*, to be produced by the sensation thus conveyed to the brain by the nerves, i. e. they must be both material, because material and spiritual things are so different and incompatible, that one would not be the direct effect of the other, or the two principles could not be so existing contemporally, and in a coeval state of development, in the same viscus. The same may be said of thought, which is the immediate

* I call it nervous energy, or influence, for reasons I shall hereafter show,

sequence of perception, and, therefore, not immaterial; and the same may be said of memory, of judgment, and of all other mental operations, the sequences of the last mentioned. If we look, on the other hand, to comparative anatomy, there I have very considerable, and, I think, incontrovertible facts to support my doctrine. In the most perfect animals, where the senses are the most numerous and perfect, we have nerves extending between them and certain medullary portions in the lower part of the cerebrum; and so that there is a medullary mass of the brain corresponding to, and continuous with (through the medium of the medullary part of the nerves) an individual sense; and we have the intellectual part, or the higher part of the brain, corresponding in size, so as to be commensurate in its development with the understanding, and with the necessities for these senses thus numerous and perfect. This is the state of man, whose brain and mind* are most perfect. As we look through the inferior gradations, and as we are proceeding lower, we shall find that all, or most, of the senses become less perfect or less numerous; here the corresponding parts of the brain are less developed, or as the senses become fewer, so the corresponding parts to the senses in the brain will be necessarily fewer; in a ratio to these defects, the intellectual or mental part of the brain, as it may be termed, will be less in size, because there are fewer agents, or fewer senses, to excite the sensitive mass into action, and its operations are proportionately more limited, bearing a parity with the senses, and the necessities of the animal. In animals still lower, we may have a very imperfect system of nerves, and a correspondingly imperfect brain surrounding the top of the œsophagus, in the form of a large ganglion, but this is only commensurate with the comparative non-complexity in the frame of the animal at large, and its less necessitous condition. If we go still lower, we find the sensitive or nervous essence pervading the polypus, like so many granules or spots; nay, if we go still lower, we have a symptom of this essence existing in a modified state, in close association with the organization of the sensitive plant. But to review the statement that I have just made, for the purpose of showing that *all these animals* have, more or less, a *mind*.—The training of the dog, the breaking-in of the horse, and the laugh-

able feats of the elephant, are the education of these animals, and no system of education could possibly be carried into effect, without a mind to work upon, or in which that is to be inculcated. A man strikes a horse, he feels the pain produced by the impression of the whip on his back, that impression is conveyed from the part, through the medium of the nerves, to the brain; the impression begets perception, perception excites thought, thought excites memory;* he recollects what he has been taught—the whip excites; his judgment then teaches him to direct an impulse, through the medium of the moving nerves, to the voluntary muscles, for the purpose of quickening his pace. A horse knows his way to his master's stable; this is by dint of memory, or, what is the same thing, by his education. But I will ask any philosopher or divine, can this elephant, this horse, this dog—nay, we will say, a spider, a lizard, a snake, or a cockle, be possessed with an *immortal soul*; and if so, (for we have undeniable proofs that all nature is imperfect, and, consequently, that animals partook of the fall of Adam along with man,)—forsooth, by parity of reasoning, if we consider God just, which he certainly is,—these should all have a bible—a revelation—ministers—religions—and a future state; but such an economy would be an unmerciful extravagance in the Creator, and would be derogatory to all the attributes of the Deity, as well as the dignity of man, *who is asserted to be "after his own image."* As such a principle as a soul is undeniably acknowledged—is it not, I would say, an absurdity to suppose, that the last-mentioned passage in scripture refers to any thing else? If a spiritual principle does exist, it must be totally different from matter, and incompatible with matter, in a certain sense; i. e. organic matter could not have its operations fully developed *coterminally* with those of the immaterial principle, the soul, in the same frame, or we should necessarily know more of the exact properties of the soul, or the nature of spiritual things. As long as organic life continues, so long, I maintain, the soul must remain dormant; but, on the other hand, as soon as the life of the body ceases, so soon the soul enters into a state of development, or into a state of actual (I may say sensible) existence; because, as we are taught, it is intended for a spiritual world; material and spiritual things cannot be existing in a state of intimate association, because they must be as different in nature as two extremes can possibly be; and, consequently, their state of sensible co-existence would be incompatible, and their

* For there is no reason why the term mind may not be applied to the functional operations of the brain, taking them as a class of operations to distinguish them from the operations of digestion, chylification, &c.

* For memory is only the accumulation of past thoughts, or past ideas.

union of function an impossibility; we know nothing of the spiritual world; let divines and philosophers say what they please, we only gather, and never shall gather any more, by researches into human knowledge, than that the works of nature are wonderful, and carried on by a concatenation of cause and effect, and that there must be a great and almighty first cause, or, in other words, an omnipotent creator,—a God. Man gathers his religion from other sources than the natural creation—the Bible and revelation, for faith is declared by our established church, to be the “foundation of our religion;” if the Bible is true—if revelation is true, as is acknowledged—if these are sent by the Almighty as our sources for religious information, and as means on which we are to place implicit dependence, it would be both unjust and irrational to seek out for sinister evidences, with the view of supporting the imagined deficiencies of the former; in short, although it is for man’s good to believe in the existence of a future spiritual world, and it would be daring folly in a person to deny it, because he cannot comprehend its nature, and impious, as well as ignorant, in the extreme, to treat such a thing with ridicule; yet he only knows the *existence* of such a thing upon the strength of the testimony of scripture, but we know nothing accurately as to the *nature* of a future state, nor have we any conception whatever as to the nature of spirits, nor can any human language convey to the mind any just idea as to their nature, or as to the properties with which they may be endowed, because our language is not calculated for a spiritual existence, but is appropriated precisely and solely to express our ideas of matter around us in this material world; and, therefore, I hold, as spirit and matter are so totally different, that even the widest extremes, or the most elaborate composition of our language, which refers to matter, should never be attempted to be used to express the *nature* of spiritual things, because we have neither language nor ideas so to do.

We do every thing from breeding and education, and without which there would be neither conscience or judgment; or, that is, a knowledge of knowing what is doing right, or what is doing wrong. For instance, suppose a man brought up in a barbarous state, and in a distant country, and supposing it were in accordance with the political and religious laws of that country, that a man, to prove himself valiant and virtuous, (for virtue, according to the notions of barbarians, consists of brutal courage,) should of necessity perpetrate a certain number of murders, and should be in possession of the heads of his victims, as trophies to testify his having consummated

the commands held out by the doctrines of his barbarous religion; this man, till having performed these duties, will feel an inward dictation, from the knowledge of the known tenets of his religion, that he had not performed those things which rendered him, in the eyes of his surrounding fellow-barbarians, equal in virtue to most of the rest of them; or he would, perhaps, be regarded in an immoral point of view by his fellow-countrymen, more especially if he had not acted with his wonted bravery when certain opportunities offered; he would feel degraded, restless, unhappy; or, more decidedly speaking, his *conscience* (fashioned by his barbarous birth and education,) would condemn him till he had fulfilled those duties. But, on the other hand, we, bred in a civilized and Christian nation, have our ideas of right and wrong—our judgment—that is to say, our *conscience*—fashioned altogether by the train of thinking our minds have been subject to in the course of this religious Christian education,—we take the doctrines of our religion as a scale—as a means of judging between right and wrong—of determining the duties that ought to be performed by man; and the comparative merit which each man has for scrupulously adhering to the principles which have been taught him for the reputation of his character, and the comparative demerits also of others. We condemn a man for murder; but supposing a people existing possessed with such a religion as the one first alluded to—they would condemn a man for perpetrating no murder, and both might be considered, (belonging to these two very different nations,) under these different circumstances of birth and education, equally guilty; both might feel *equally condemned in their minds*, and both might have entailed upon them, by the sentence of the laws of the two nations, a great punishment, in consequence of their supposed immorality.

I only wish to prove, by the above-mentioned supposition, that *conscience* is *totally a relative term*, a sensibility of the mind, an impulse dictatory to the mind, as to what is right and what is wrong; which inward monitor is only the production of an accumulation of knowledge or known facts and doctrines, or entirely the effect of education: in fine, conscience is knowledge—knowledge is conscience. Conceive a man separated from the world altogether from the very moment of his birth, that he had a communication with no human being, that it was possible for him to be brought up and fed abstractedly from the world,—that man would have no more knowledge, no more language, no more conscience, than a beast: he would naturally, but unconsciously, possess all the

powers of a man, but which powers had not been brought into action: "it is education that forms the mind," or, what is nearly the same thing, calls it into action.

There is one more observation I would make, before I close this paper, as to the constitutional or original capacity of men to attain different degrees of knowledge and mental excellence. I maintain, that all men's brains are not born alike, any more than their hands, their feet, or other organs; i.e. as there are "constitutional peculiarities" in men, speaking of their bodies in a general manner, so there are functional peculiarities of *particular* parts;—one man's stomach may naturally digest better than another's; one man's liver may produce a greater secretion of bile than another's—one man's kidney may secrete a greater quantity of water than another's; one man's circulation may be naturally quicker than another's; some men's *nervous* sensibility may be more acute than other's;—and some men's (for I believe that they are but one living principle under different modifications,) *cerebral* sensibility is greater than that of others. In other words—the powers of the mind, (the brain,) are greater; one man, where the animal functions are carried on constitutionally slow, shall, perhaps, naturally have a dull perception, and a slow succession of thoughts, indicated by a slowness of animal action, his thoughts never rising above the bounds of mediocrity, or scarcely equalling them; another man shall naturally have his functions carried on with a much greater celerity—he shall be quick in his perception, shall be the subject of a rapid succession of thoughts, much more numerous, and much more vigorous in their creation, than in the preceding case; in fact, the brain shall carry on its functions with twice the vigour, which shall open to the mind a boundless imagery, and which may be accompanied by the finest and most effective figures of speech.

I believe, then, that although all men's *minds*, or *methods* of thinking, are *fashioned* by education, and communication with people around them; yet there are differences existing as to the *natural* powers of mind. Thus, I believe that Sir Isaac Newton might have had originally, previous to his receiving any degree of education, a mind more adapted for the prosecution of his elaborate philosophical researches, than an ignorant clown who follows the plough. I believe also, that different degrees of intellect are observed in all classes, from the highest rank in society down to the lowest.

FOREIGN DEPARTMENT.

ON BRONCHIAL VESSELS IN THE FŒTUS OF MAMMALIA AND BIRDS.

IN Oken's *Isis* for 1827 and 1828, and in *Meckel's Archiv.* for 1827, there is a description of bronchial vessels which have been discovered in the fœtus of birds and mammalia. We give a detailed account of this discovery, which will be the more interesting, as, in many respects, it confirms the ideas of M. Kilian with regard to fœtal circulation, (vide No. 262 of *THE LANCET*.) It is, at the same time, another remarkable proof of the ingenious theory, that the embryo of higher animals, during its development, goes through the type of those formations which form the anatomical character of the lower animals.

Malpighi first observed, that the aorta in the incubated egg, divides into three branches, which afterwards unite again, and then represent the aorta descendens. This was confirmed by Bojanus and Pander. Rathke, of Dantzic, and Professor Huschke, of Iena, discovered, that from the third to the seventh day of incubation, on each side of the neck three fissures are visible, which lead into the œsophagus, and thus exactly correspond to the branchial apertures in fishes. The highest is the largest, and the lowest is the smallest of the three. The gelatinous masses between them are to be considered as branchial arches, and it is very probable, that the uppermost is the rudiment of the lower jaw, and the lowest that of the os hyoides. It appears further, from the observations of MM. Huschke and Rathke, that instead of the three branches formed by Malpighi, the aorta sends a branch to each of the lateral apertures, so that there are altogether six vessels going from the aorta. On the 4th day, the highest bronchial artery divides into two branches, one anteriorly, which is the future carotid, the other posteriorly, which anastomoses with the next bronchial vessel. This and the third bronchial artery also anastomose, and the union of all three with those of the other side, form the trunk of the aorta descendens. No other ramifications seem to take place from the bronchial vessels. On the 5th and 6th day the bronchial apertures begin to contract, and, at the same time, the vessels undergo some very important changes. The third bronchial artery of the left side, which from the beginning was the smallest of all, disappears; that of the right side remains, but ceases to anastomose with the middle bronchial artery, and becomes the future right pulmonary artery, the left being formed by the middle bron-