A discussion on the organic materiality of the mind, the immateriality of the soul, and the non-identity of the two ... / by G.D. Dermott.

A DISCUSSION

ON THE

ORGANIC MATERIALITY OF THE MIND,

THE

IMMATERIALITY OF THE SOUL

AND THE

NON-IDENTITY OF THE TWO;

PART I.

BETWEEN "A PHRENOLOGIST," "M. D—S," AND G. D. DERMOTT.

PART II.

INCLUDING MR. DERMOTT's REPLIES TO THE LAST PAPERS OF "M. D—s, MESSRS. THOMAS AND FORSTER," ON THE ABOVE-MENTIONED TOPICS, AND THE VITAL PRINCIPLE.

ALSO

SOME COMMENTS ON DR. WILSON PHILIP'S WORK

ENTITLED,

"An Experimental Inquiry into the Laws of the Vital Functions; with some Observations on the Nature and Treatment of Internal Diseases, by A. P. Wilson Philip, M.D. &c. In part republished from the Philosophical Transactions of 1815 *and* 1817; *with the Report of the National Institute of France on the Experiments of M. Le Gallois, and Observations on that Report."*

BY G. D. DERMOTT.

LECTURER ON ANATOMY AND SURGERY.

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ON THE

ORGANIC MATERIALITY OF THE MIND;

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IMMATERIALITY OF THE SOUL,

AND

THE NON-IDENTITY OF THE TWO.

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 exactly 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 probably 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 commonly called,) are nothing else than the *organic functions* of these several parts of the brain, just 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 raving madness or inflammation, and perhaps as a more remote effect, coma, or paralysis of the brain, 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 chylification—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,

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

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 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

* 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.

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 laughable 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, by the excitement of the whip; 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 *contemporally* 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 or inactive; 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 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 nor 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

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

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 others'; 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 natually 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 the 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.

REPLY TO MR. DERMOTT'S COMMUNICATION

ON THE

MATERIALITY OF MIND.

To the Editor of THE LANCET.

SIR,—Though a divine, I happen, nevertheless, to be a reader of THE LANCET, which has found its way even into this hyperborean region; and, foreign as its contents may seem to my professional studies, I read it with great interest and pleasure, and rejoice in the good that it has done, is doing, and is likely still to do. I certainly never dreamed of becoming a correspondent to it; but an article in your Number for October 11, which I have just read, impels me to request further information upon the important subjects to which it relates, and which I hope the author of that article will feel it his duty to communicate. In the article to which I refer, the author, G. D. Dermott, Esq., has, by a very profound physiological investigation, "clearly" established the following positions:—

1. That perception, thought, memory, judgment, and all other mental operations, are functions of mere matter.

2. That we have no 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 are endowed; that, in short, we have neither language nor ideas to enable us to express the nature of spiritual things.

3. That material and spiritual things are so different and incompatible, that the one cannot be the direct effect of the other—that they cannot be existing in a state of intimate association, because they must be as different in nature as two extremes can possibly be.

4. That the lower animals have *minds*, but that they have no *souls*.

5. That man, besides a *mind* has also an immaterial and immortal *soul;* but that so long as organic life continues, so long 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—it may be said sensible—existence.

6. That there must be a great and almighty First Cause, or in other words, an omnipotent Creator—a God.

7. That without education, there would be neither knowledge nor conscience, which are just convertible terms—that it is education that forms the mind, or, what is nearly the same thing, calls it into action.

I mean not, at present, to incur the guilt of calling in question the accuracy of any of these positions, as, besides being drawn from the depths of physiology—a science of which I am, as in duty bound, most profoundly ignorant—most of them bear the stamp of a very venerable antiquity, for which I have a great reverence. But as all the doctrines which we divines are accustomed to teach, vanish before these positions, "like the baseless fabric of a vision," I should like, before entirely new-modelling every article of my creed, to apply to Mr. Dermott for some explanations, which I hope he will consider it a duty to give.

I am naturally very anxious to know what is to become of us poor parsons, in consequence of the new light which has thus been poured over this happy age. If men should conclude that "Bibles, revelations, ministers, and religions," are totally useless in this present world, and owe their existence to a mere delusion, why then you know "Othello's occupation's gone." And how this conclusion is to be avoided I really cannot see: for "Bibles, revelations, ministers, religions," have nothing whatever to do with the mental powers, since Mr. Dermott shows that the lower animals possess these powers, yet need neither Bibles nor ministers, because they have no *souls*. And, as far as I can see, Bibles and ministers can be of as little use to the soul, which does not begin to live till the body be dead. Why then should these articles be retained, on the pretence of preparing for futurity a soul, which has no actual or sensible existence, till it is far beyond their reach? Truly I tremble for my craft, and so may you too, Mr. Editor, for yours. For when theology is banished from the world, I again ask, what are we poor parsons to do? We can neither dig nor beg, and I doubt not that many of us will just turn physiologists, and crowd the already overcrowded ranks of your profession. One of the nonconformists, who was ejected in the reign of Charles II., said that many would have reason to mourn his ejectment; and being called to account for his words, said, all that he meant was, that he intended to commence the practice of medicine. Now, when Mr. Dermott has got us all ejected from our pulpits, I fear many will have cause to rue it, and your profession hardly less than ours.

Ministers often complain of the inattention with which they are heard, and of the little good that they are able to do; and no wonder, truly, now the secret is out. The soul to which they are addressing themselves, is all the while enjoying a sound repose. This fact also accounts for a mode of preaching which has become very fashionable, and with which, I confess, I have hitherto been so ignorant, as to be not a little disgusted. I have seen men—and should you have happened to stray into a church, so probably have you—labouring in the pulpit like a quarry man at piece work, with their arms going like the sails of a windmill. And because old people like noise nearly as well as children, I have heard preachers highly

praised for no other reason than that they out-heroded Herod, and "amazed, indeed, the very faculties of eyes and ears." This I used to think totally inconsistent with the solemnity of the gospel, and approaching even to profanity. I now acknowledge my mistake. These men, I suspect, are aware of the sleep of the soul, and laudably endeavour, by the union of vehement vociferation, and violent gesticulation, to arouse it from its torpidity. I now admit the propriety of speaking so much louder than is at all necessary to be distinctly heard, and that they who address the soul, have as much reason as the priests of Baal to leap, and to shout aloud. I admit the propriety of the praise bestowed upon strength of lungs well applied.

"Some of the sermon talk, a sober crowd,
And loudly praise, if it were preached *aloud*."

Yet of what use, after all, can this tremendous bawling be, when it is quite clear that the soul cannot be accountable for any of the deeds done in the body—deeds of which it has no knowledge, and over which it can exercise no control?

Again: Mr. Dermott says that I have an immaterial and immortal soul. As he says so, I cordially believe it. I used to think that I could prove this too, but in this I find I was wrong. This soul has no operations or effects from which its existence can be inferred. Now, as the fact of its existence is undeniable, and as Mr. Dermott has swept away every argument by which philosophers and divines, from Plato downwards, have attempted to prove that existence, I should like very much indeed to know, upon what grounds he believes in its existence. I confess I feel it very awkward to carry about with me, and to boast, too, of possessing, a soul, when I am totally unable to produce the slightest evidence that such a thing exists. It is unpleasant to believe, one knows not why, excepting just that Mr. Dermott has said so. Now there may be folks foolish enough not to consider this a satisfactory reason. Will this physiologist, then, have the goodness to tell us in what part of the organic structure he has found it. Were it an active vital principle spread over the whole, and animating every part, this inquiry would be useless; but as it is dormant, it must have a local habitation; *videlicet*, a dormitory. Now, scientific men, as well as divines, will surely be curious to hear if Mr. Dermott has, in the course of his physiological researches, found out this dormitory—has detected the sleeper napping in its cell, like a toad in a block of marble, and caught it while just beginning to exercise its new found powers, and to shake off the slumbers of some threescore years; or if it make its escape from the body, ere his knife can reach its abode, has he found, at least, the place where it has recently been, just as at Chillingham Castle, in my neighbourhood, they show, in one of their marble chimney-pieces, not the toad, but the cavity where the toad lay. As he has left us no other proof of the soul's existence, I hope he has got a few specimens preserved in bottles, hermetically sealed, and which, on being opened, will prove the correctness of his views, by more than realising all the freaks of the *bottle-imp*,—*le diable boiteux*. I repeat, that as Mr. Dermott says that I have a soul, I believe it; yet it would be more satisfactory, both to your profession and ours, if we knew on *what grounds* we are entitled to believe that we have within us a dormitory, occupied by an insensible, immaterial, immortal dormitant.

Some people, also, may be sufficiently inquisitive to ask, for what conceivable purpose the soul is sent to sleep in a material body for some threescore years and ten, before it comes into actual or sensible existence? If it be alleged, as on the Pythagorean system it may be, that the soul is lodged in a material body, on account of guilt contracted in a previous state of being, it may be replied, that according to Mr. Dermott, the soul, as we shall presently see, possesses no moral powers, and, therefore, can contract no guilt. And supposing this difficulty removed, which I have no doubt Mr. Dermott can easily do, it may be further asked, why souls should be sent to sleep in human bodies only? Would not the organism of an ox or an ass afford as convenient a dormitory as that of Mr. Dermott himself? In the present state of my information, I can by no means prove that *no* animal has a soul, nor that *every* human body has one, which, you will allow, it would be very desirable to do.

I would not, on any account, be guilty of doubting the unerring accuracy of any conclusion which Mr. Dermott has drawn from physiology; but when he enters on metaphysics, one may, I hope, without the guilt of heresy, venture to suggest the possibility of some improvement in his speculations. Now it appears to me, that in order to support the dignity of man, as the only possessor of a soul, he has dealt somewhat hard measure to the lower animals. Happily, however, his argument in this case is not physiological, but metaphysical, and, therefore, not altogether beyond the range of a parson's powers. He argues from the justice of God against the immortality of brutes. But he is doubtless aware, that a conclusion directly the reverse has been drawn from the same source. It has been said, that as the lower animals suffer from the fall of man, without any guilt of their own, (this Mr. Dermott expressly admits,) the justice of God will provide some compensation for their guiltless sufferings, and that when they have escaped the woes which man's guilt has brought upon them, they may expect

"Some sheltered spot in depth of woods embrac'd,
Some happier island in the watery waste,"

where such enjoyments as their nature is capable of will be allotted them. On this, however, I do not insist, being too anxious, at present, to obtain some definite information with regard to my own soul, to feel very deeply interested about the souls of the inferior creation.

I feel very anxious to know what sort of entity this soul is—what is its peculiar nature, or what are its characteristic properties? While it is in the body it is immaterial, insensible, inactive, without actual or sensible existence, which some logicians would consider no bad definition of—*nothing*. But when this non-existent entity leaves the body, and acquires an actual existence, what kind of being is it then? Intellectual and moral powers it cannot possess, for these are attributes of *matter*, and cannot, therefore, be the attributes of spirit also; for if matter and spirit possessed these attributes in common, there could be no such incompatibility between them, as to render them incapable of even existing in intimate association. That Mr. Dermott considers the soul as having no intellectual or moral powers, appears also from the language which he uses when speaking of spirit; for he talks of the properties with which it is not *endued*, be it observed, but *endowed*. Raw and ignorant writers are apt, we know, to confound these two words; but it would be profanity to suspect, that the philosophic Mr. Dermott uses the latter term from ignorance, or for any other reason than that it just correctly expresses his meaning. Now if the soul, while in the body, be to all intents and purposes a nonentity, and, when it leaves the body, be neither material, intellectual, nor moral, I would humbly beg Mr. Dermott to give us some idea of what it is; or, if this be impossible, at least clearly to state the grounds upon which we can possibly believe in its existence. I hope he will have the humanity to drag us poor unphysiological wights out of the manifold perplexities into which his splendid discoveries have plunged us.

Mr. Dermott has also turned adrift all my previous notions as to the Supreme Being, and I am reduced to the necessity of begging to be informed upon what grounds he believes in the existence of such a Being. If I understand him rightly, he means to say, that we learn this from the works of Nature, and that, let divines and philosophers say what they will, we shall never learn *more* from their works. Now I have always been accustomed to think, that from the works of Nature, neither philosophers nor divines had ever discovered even *so much*; for I know not of any individual, of any description, who from the works of Nature *discovered* the existence of a God. To prove this fact, *after* its discovery, is no very difficult matter.

But what I am most anxious to learn at present is, what kind of a being God is? A pure spirit he cannot be; because, though we know nothing of spirits, and have neither language nor ideas to express their nature, yet we do know, that they are not only different from, but so incompatible with, matter, that they cannot even exist in intimate association with it. They, consequently, cannot possess any attributes in common with that which stands in the extremity of opposition to them; and therefore can have no intellectual or moral powers, which are attributes of matter. Besides, if he were a pure and unmixed spirit, he could not, according to the physiology which Mr. Dermott has, on this occasion, not only deigned to borrow, but to borrow even from a divine—be the creator of matter. But if God could not be the creator of matter, were he a simple uncompounded spirit, neither could he be the creator of matter, if matter formed an essential part of his being. Then matter must be eternal; and the question will be, what did this omnipotent creator create? Sleeping souls, perhaps. Then the soul must be, indeed, a third genus of the order Substance, for the knowledge of which the world is indebted to the discoveries of Mr. Dermott, discoveries which, in this instance, throw those of all former philosophers into the shade. I may just remark that the good old doctrine, which makes God the soul of the world, is quite inconsistent with his view of the soul; but, perhaps, he means to adopt the modern modification of that doctrine, which is exhibited in the soophecism of Persia.

In short, will Mr. Dermott have the goodness to tell us hapless, unscientific mortals, how we may prove that such beings as God and the human soul exist; and, as far as his discoveries have yet reached, what sort of beings they are?

Mr. Dermott's positions suggest many other remarks; but I am wearied with hunting this profound nonsense, the very rarity of which would redeem it, and embalm it, as a theme of laughter to the world's end, were it not that it is as trite as the king's highway. When a man is sufficiently idle and ignorant to busy himself in collecting the scattered absurdities of every age and clime, the exploded abortions of every forgotten system of human folly, the very sooterkins of sciolism, and, packing them in a bag of precious fustian, comes again to pour them over the pages of THE LANCET, do, I beg you, let him know that he has altogether mistaken his publisher; that you cannot waste your pages, and choke your readers with the "*crambe sexcenties recocta*" of such philosophers as the French Mirabeau, the American Palmer, and the English

Carlisle, all of whom have treated the positions maintained by Mr. Dermott in a far more masterly manner than he has done.

Indeed, had not his speculations found a place in THE LANCET, nobody would have dreamed of wasting half an hour in noticing absurdities with which the world has been drugged, *usque ad nauseam*, by the worthies just mentioned. For what one physiological fact has he brought forward, or what one folly has he inferred from his facts, that was not *omnibus et lippis notum tonsoribus*, at least seven good years before his body began to exercise its mental functions, or afforded a cradle to a sleeping soul? In him, indeed, there is assuredly something that is sleeping, snoring loudly, and dreaming wildly. But when these dreams find their way into so ably conducted and so widely circulated a publication as yours, they may prove hurtful to some of the many young men who, in the course of an unfinished education, listen to the instruction conveyed through the medium of THE LANCET, with a respect to which, it is cheerfully admitted, their ability has hitherto richly entitled them. You, as Editor, occupy a highly responsible situation. It is your duty to guard against the admission of papers which, while they inform the mind, may pervert the principles of these young men, and, still more, to exclude papers which might do the latter, without the possibility of doing the former.

I am well aware that your task is no easy one, though many people will think it is; I would not, therefore, censure Homer very sternly, though he would sometimes nod. You, I fancy, like other Editors, sometimes take a trip to the seacoast; and, like other Editors too, find such excursions rather hazardous. I take it for granted that you were purifying yourself from the "sin, and seacoal smoke" of London, and getting braced, for the winter campaign, by the breezes of *Hastings*, when the luckless paper which has called forth these remarks, was inserted.

Physiology is a science equally delightful and useful. It is to be regretted that such men as Bichat and Lawrence should have drawn from that science conclusions which have no connexion with physiology, and which it cannot be difficult to show that physiology does not sanction. As, however, their writings are in the hands, and fitted only for the perusal, of scientific men, the evil is less. But when similar conclusions, in grosser forms, are adopted by men who have nothing of science but its parade, and propagated among young medical students, the mischief becomes serious, and the parents and friends of these students will naturally take the alarm.

In fine, Mr. Editor, go on as you have begun. Maintain the respectability and independence of your profession. Stimulate the energies of the young. Leave no refuge to fools or knaves among you. Pour the light of day into the abodes of BATS AND OWLS. Take care of every thing relating to the sciences which tend to promote the welfare of our bodies, and leave us in quiet possession of our souls, and of our God. If you admit papers which tend to shake our belief* in the existence of these, I doubt not that, from a sense of justice, you will admit papers in defence of these important articles of faith. But the discussion of these subjects would by no means suit your work. Of theological controversy we have, at home, enough and to spare. Therefore, after inserting this, as I take it for granted you will do, let your readers hear no more either of the sublime inanities of G. D. Dermott, Esq., or the humbler criticisms of

Your most obedient,

M. D—s.

Belford, 12th Dec. 1828.

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* We insert our correspondent's agreeable communications with much pleasure; but we cannot discover any thing in Mr. Dermott's paper to justify this inference. —ED. L.

PHRENOLOGY.—MATERIALITY OF THE MIND, &c.

To the Editor of THE LANCET.

SIR,—Knowing the liberal principles with which your Journal is conducted, and that your pages are always dedicated to "free discussion," I have been induced to send the following remarks upon a paper, "On the Organic Materiality of the Mind," by G. D. Dermott, Esq., which appeared in THE LANCET of the 11th of October last.

I am yours, &c.,

A PHRENOLOGIST.

Dec. 20, 1828.

It will be seen by this extraordinary essay, that the author comes boldly forth as a voluntary defender of materialism, yet, fearing the obloquy that awaits those who deny an immaterial agency in man, he subsequently admits—nay, maintains, that the existence of the soul is "undeniably acknowledged," though *dormant* in this life. I shall endeavour to examine the propositions in this gentleman's paper *seriatim*.

He first asserts (and it will be seen

throughout, that assertion supplies the place of proof) "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."

As this conclusion is so highly interesting, we would gladly be informed how Mr. Dermott made the discovery of the birthplace of certain qualities which become diffused, &c.; where he found the propelling or circulating power, and how "the medullary part of the brain" is proved to possess "all the distinguishing living properties peculiar to the brain, as living brain."

Now Mr. Dermott "*knows* that there are certain masses, or portions of the brain, individually possessing their peculiar properties," which is the *peculiar* doctrine, I believe, of phrenology; consequently, as these "peculiar properties," according to the first assertion, originate in the cortical part of the brain, they must be propelled or circulated through the medullary part of the brain and nervous system, of which we should like to examine some few of the author's proofs.

Mr. Dermott then asserts that "one particular portion of the brain is the region of perception, another of thonght, another of memory, and a fourth for judgment;" and we cannot but regret that none of these attributes of the fundamental faculties of the mind have been assigned a place except judgment, which we are told resides in the cerebellum! What, then, are the offices of the cerebrum? These are fully established by Messrs. Flourens and Rolando, says our author; for these gentlemen, he would make it appear, have taken away the cerebrum, and with it perception, thought, and memory, but have left the judgment sitting undisturbed "amid the wreck of matter" in the cerebellum! Now, that taking away an individual's brains should deprive him of memory, &c., we can easily conceive, but to allow his cerebellum to remain, and with it his judgment, is very curious: reversing the order of things, however, we are led to suppose that the aforesaid gentlemen have removed the cerebellum and its illustrious inhabitant, and have left perception, thought, and memory, to revel, uncontrolled by judgment, in the apartments of the cerebrum! Let experimentalists look to this; who knows but, in a short time, we may see some "march of intellect" man obtain a patent for purifying people's judgments, or, in other words, for an instrument to relieve them of all unnecessary incumbrance of thought, perception, memory, &c., by removing "the seat of birth" of these troublesome faculties. But to be serious: Mr. Dermott says, "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 in the profession, should confine their speculations." If divines and sensible men were to confine their speculations on mind to dead or inorganic matter, it is pretty obvious their speculations would soon be a dead letter.

To return more particularly to our point —we have hitherto learnt from Mr. Dermott's paper, that all the varied operations of the mind are comprised in four functions, viz. perception, thought, memory, and judgment, yet not a single fact is proposed as a proof of this, unless the assertion could be taken for one, that Messrs. Flourens and Rolando have separated the cerebrum and cerebellum, and with these their several assigned functions.

Let us now go to where Mr. Dermott takes up the "argument on fresh grounds," which are these, that nerves feel by their peculiar properties, and that sensations and impressions are conveyed from the different parts of the body to the brain, and this (the brain) "produces perception of sensation." An assertion follows, viz. that perception and sensation are material, being the actions of living matter; and further, that they *must* be material, because material and spiritual things are incompatible! Thought is stated to be the immediate sequence of perception, and therefore not immaterial! "The same may be said of memory and judgment, and all other mental operations, the sequences of the last mentioned." From these assertions, it would appear that all actions of matter must be material, and that actions of matter, and matter itself, are incompatibles!

To support Mr. Dermott's doctrine, we are directed to look to comparative anatomy for "incontrovertible facts." This, we are told, teaches that the intellectual or higher part of the brain corresponds in size, so as to be commensurate in its development with the understanding, which we are given to suppose, from the former assertions, is composed of memory, thought, and perception; the judgment, let us bear in mind, resides in the cerebellum, and, consequently, far removed from the "higher part of the brain," so that the understanding is not necessary to judgment. Now, were it correct that the intellectual or higher part of the brain corresponds in size to the understanding, a very useful table might easily be constructed, that would afford us, at one glance, the exact proportion of intellectual acumen possessed by any given individual.

We are further informed, that the rea-

son of the intellectual, or mental part of the brain being less in size in the lower class of animals than in man is, "because in these there are fewer agents and fewer senses to excite the sensitive mass into action:" another assertion, unproved by comparative anatomy. We would ask, has the cat, or dog, or sheep, so fewer of the senses to excite it, or do these animals actually possess the senses more acutely than man? We are afterwards assured, that all animals have more or less a mind; but as this involves a definition of the term, we leave it for the present. Mr. Dermott further asserts, that Nature is imperfect, which is the most preposterous and noxious of all,—and that animals "partook of the fall of Adam" along with man; and then a joke about providing animals with bibles follows. We come now to a strange inconsistency: we were told in the early part of the paper, that material and spiritual things were different and incompatible, and yet it now appears, that "such a principle as a soul is undeniably acknowledged;" and, as if to reconcile these contradictory creeds, our author makes the soul to be dormant as long as organic life continues, and that on that ceasing, the soul enters into a state of development, or, we suppose, "it wantons in endless being."

From the boldness with which Mr. Dermott makes these assertions, one would really suppose that he had already an insight into the "secrets of the prison-house," if, in the next place, he had not said, that we know nothing of the spiritual world, whatever divines and philosophers may say. Mr. Dermott now grows serious, and after talking of providing the lower animals with bibles, considers it "impious as well as ignorant in the extreme, to treat such a thing with ridicule." We wonder, after assigning different functions to different parts of the brain, Mr. Dermott did not point out the dormitory of the soul, as well as of the judgment.

We are glad to come, at length, to two causes for all our actions, and these are breeding and education, which give birth to conscience and judgment; and these terms a little further are made synonymous, and then each is used but as a relative term: finally, this paper closes with a chapter of the author's belief. How much it is to be regretted, that we cannot take the advice of Horace in writing for the public:—

"Sumite materiam vestris qui scribitis
æquam veribus."

It occurs to us, that perhaps many of your readers may not trouble themselves to ascertain the justness of our remarks on Mr. Dermott's paper, since its diction, its want of arrangement, and the absence of its logical deductions, render it totally uninviting, we shall, therefore, append a summary view of what we consider sufficient to substantiate our charge of presumption, of dogmatism, of inconsistency, and of Mr. Dermott's ignorance of some of the most striking facts in nature. We insert twenty-three of his assertions, unsupported by proofs:—

1st. That the cortical part of the brain is only subservient to the medullary part, and that the medullary part of the brain and nervous system have certain qualities diffused and circulated through them, which had birth in the cortical part.

2d. That there are certain portions of the brain which individually *possess* peculiar functions,

3d. That there is one particular portion of the brain for perception, another for thought, a third for memory, and a fourth for judgment, which is attempted to be proved by a

4th assertion: that we may *take away* the cerebrum, and with it perception, thought, and memory, the cerebellum remaining; and then that we *may* remove the cerebellum ("without the cerebrum,") and we thereby take away the judgment.

5th. Have all men and animals judgment in proportion to the cerebellum? That Messrs. Flourens and Rolando have established this fact, which, in reality, they never attempted to establish; their opinion, or rather the opinion of M. Flourens, being merely that the cerebellum presides over the forward motion of the animal.

6th. That mental *actions* are nothing else than organic functions.

7th. That the opinions here advanced it is in vain to controvert.

8th. That our ideas are founded on dead or inorganic matter.

9th. That sensation and perception are both material, because

10th. That spiritual things, and things material, are incompatible, and that neither of these could be the effect of the other.

11th. That thought is the immediate sequence of perception, and that memory, judgment, and all other mental operations proceed from perception: inconsistent with No. 4.

12th. That these assertions are supported by comparative anatomy.

13th. That we have, in the most perfect animals, the size of the intellectual, or higher part of the brain, corresponding to, and commensurate with, the development of the understanding.

14th. That this is the state of man.

15th. That all nature is imperfect; and that animals partook of the fall of Adam along with man.

16th. That animals should all have ministers, religions, bibles, and revelations, and should enjoy a future state.

17th. That organic matter could not have its operations fully developed, contemporally with those of the immaterial principle—the soul.

18th. That as long as organic life conti-

nues, the soul must remain dormant; and that, as soon as the life of the body ceases, the soul enters into a state of actual existence.

19th. That material and spiritual things cannot be existing in a state of intimate connexion: inconsistent with 18.

20th. We do every thing from breeding and education.

21st. That conscience or judgmeut results from education. Do the educated alone possess conscience then? or is their conscience proportionate to their education? Do animals possess conscience in proportion to their breeding and education?

22d. That conscience is only the production of an accumulation of knowledge.

23d. That conscience is entirely the effect of education.

We repeat our former opinion, and maintain, that this paper is presumptuous, inasmuch as it professes an acquaintance with subjects not cognisable to man's senses.

That it is dogmatic, as assertions Nos. 11, 15, 16, &c., will show. That it is inconsistent, may be seen by Nos. 4 and 21, &c. That it is ignorant of nature, will be seen by assertion No. 4, 5, and 18.

We cannot but regret, that Mr. Dermott, while deeply engaged in a positive science, should put forth such theoretical notions; that he should write papers absolutely useless, nay, worse than useless, injurious;—injurious not only to himself, but to the reader, who misapplies his time—the very *material* (?) of which his life is made.

ON THE ORGANIC MATERIALITY OF THE MIND; &c.

By G. D. Dermott, Esq.

To the Editor of The Lancet.

Sir,—I feel myself bound to notice any thing you may be inclined to honour with a place in your very able Journal; and on that account, principally, I now come forward to meet two attacks, the one from a *soi-disant* clergyman, the other from a *soi-disant* phrenologist, upon my paper concerning the "Materiality of the Mind, and the Immateriality of the Soul." As affairs of argument, it would be absurd to array myself against them; both, especially the writer who styles himself "A Clergyman," have so entirely misstated my case, that I can have no fair battle with them; they both conjure up phantoms, which they call mine, and then set about to overthrow them. As somebody says, in the mock tragedy of *Tom Thumb*, they "make the giants, and then conquer them."

My theory is briefly this:—First, that the mind is a material principle; that is to say, that all the intellectual faculties are the organic functions of the cerebrum, in fact, the organic life of the brain (taking it for granted that the principle of life is that which is so essentially and specifically combined with all organic matter, as to be the immediate *cause* of all action, or function, in organic matter). That the brain is an epitome of nervous impressions and actions—that the thoughts are actions of the brain—are excited by impressions made on its nervous susceptibility, i. e. that these actions of the mind are sequent to other material impressions and actions in the nerves, occasioned by external agents, positions which, I think, are finely illustrated by the continuity and homogeneousness of structure and substance between the brain and the nerves. Secondly, that this same material mind is common to all animals, being one and the same thing as the brain; but that the faculties of minds are stronger and better developed in a ratio to the size of the different portions of the brain; the vigour of its organic action, and the healthy condition of its structure.—Thirdly, that there is this difference between man and animals: another principle is attached to man's existence, which is not attached to that of animals, it is not demonstrable, but attached to our being, in some way perfectly inexplicable—we call it the soul. That this soul, being entirely spiritual, is of a nature not to be understood by a material mind; it is the spiritual part of man's existence, referred for a state of development in a spiritual world: perhaps, if I may be allowed to use a comparison for the sake of explanation, to be the future spiritual mind of what has been metaphorically called, in Scripture, a spiritual body. That it is rational to admit that this soul, in a future state, shall be responsible for the actions of the mind in the previous material existence, because it is the continuation of the same individual's existence, only in a different state or form, the mind being the ostensible representative of his existence in this world as the soul is in the next.

Having thus endeavoured to define my own theory in my own way, I return to my two assailants. The observations of the first, as I have before suggested, are any thing but argument; of course they can admit of no argument in reply. I shall, therefore, presently leave him, hopping and floundering in his marsh of contradictions, with his favourite "toads and frogs," the fit companions of a person who so admirably unites the venom of the one with the ridiculous contortions and the dirty splashings of the other. Their society will perhaps, be a relief to him after "smoking himself," during the winter, with "sin

and sea coal," as some vicars are wont to do, who love mammon more than God.* But before we part, I must trouble you, Mr. Editor, with an extract or two, and some comments on them, to show the consistency, the honesty, the meek, kind, Christian-like readiness to falsify not only my arguments, but my motives, with which this professed son of the church comes forward to show his zeal for true religion!

First,—He hopes I shall "feel it my duty to communicate further information;" and, "he must apply to Mr. D. for some further explanation, which he hopes he will consider it his *duty to give*." Again, he says, "After inserting this, as I take it for granted you will do, let your readers hear *no more*, either of the sublime inanities of G. D. Dermott, or the humbler criticisms of ———" no one knows who! Now this seems to me mightily like daring an enemy, and then piteously asking you, Mr. Editor, to tie him hand and foot; a rare device, I must own, and one which, like the rest of his tirade, shows more familiarity with the stage than with his Bible. It is of a piece with the valour of the man in *King Lear*, who waits till Kent is in the stocks, and then capers around the sturdy old warrior, twitting him with bad jokes and poking him, at arm's length, with a dull sword. So much for his consistency. Now for his honesty. He wishes to represent me as having stated, that "material and spiritual things are so different, that they cannot be existing in a state of association." No impartial person, who reads my paper, will suppose that this is the doctrine I inculcate. On the contrary, I have affirmed the possibility and the certainty of a co-existence, but deny a "*sensible* co-existence;" i. e. I do not believe that soul and body can hold a coeval, contemporaneous and combined state of *development*.

The soul is not in a state of development in our present being; we do not know its qualities, its nature, nor can we rationally demonstrate its existence; that is to say, its qualities and its existence are not known and identified by our senses and natural powers: this is what I would mean by saying, that it is in a state of insensible as well as undeveloped existence. It is a principle attached, no one knows how, by God, to man's existence, the part which is responsible for the mind's actions, in a future state; the principle which is the representative of a man's previous material existence. This non-realization of the soul to our own reason and senses, in spite of the sagacious divine's ridicule, goes, I think, some way to prove, that it is not, in this world, in a developed state, that is to say, it is dormant, if he will admit of the term.

Mr. Editor, I admit of the existence of the soul, but differ from your correspondents in believing, that the mind and soul are one principle, and because of this, without my opinion tending to question, in any degree whatever, the validity of one single doctrinal point in the Bible, he impeaches me, by making a false deduction, viz., that consequently I must consider "Bibles, revelations, ministers, and religion as totally useless in this present world, and owing their existence to mere delusions, and that my paper tends to shake a Christian's belief," and most unceremoniously thrusts me down amongst a list of infidels! This reasoning is logical; this palming of doctrines upon me, which I should shudder to espouse, is his honesty—his God-like grace, I suppose! He most shrewdly asks me, what kind of a being "God is? How is it to be proved that such beings as a God and the human soul exist? and what sort of beings are they?" Is it necessary for me to tell a *minister*, that he must not either apply to his own, or to any other man's *reason* to prove these things, but to his Bible, where he will find them explained, as far as God, in his divine dispensation, has thought fit to reveal. He will also find, in his Bible, that the impossibility of conceiving of spiritual things, excepting by the power of faith, is every where inculcated; that it was to kindle and keep alive this essential faith the Bible itself was given, and that the utter incompatibility of spiritual demonstrations with the powers of material minds, is distinctly shown in the assurance, that no man can see God, who is a Spirit, and live.

As to his trying to suggest the possibility of an improvement in my speculations, by supposing that animals have souls, if he (being *really* a "parson?") knows sufficient of theology to prove it, or render it probable, let him do so; I frankly own I cannot. But by way of making his incomprehensibly inconsistent paper complete, he says, the "very *rarity* of my paper would redeem it, were it not as *trite* as the king's highway." I deny, also, having collected any "scattered absurdities," or any "exploded doctrines;" what I have said is my own opinion, springing solely from my own observation. I have never read any writers either favouring infidelity or even advocating the materiality of the mind. I have heretofore avoided them upon the score of the materiality of the mind having been formerly made use of to favour infidelity, and my feeling an utter aversion to all such principles. He accuses Bichat and Lawrence of having drawn conclusions which phy-

* I beg leave not to be understood as conveying any sneer against religion and its professors, such an idea I should abhor: I allude only to those who bring the holy office into contempt. For the rest, no man can have more reverence than myself.

siology does not sanction, but, in the same paper, confesses he is no physiologist! and therefore we may conclude, not able to judge of the veracity of what he states.

These are the only points at all worth notice in his paper. The rest are mere rant. His personalities, of course, I put out of the question. I can only observe of them, that they are a sad commentary upon the influence of what he asserts to be his creed, upon his conduct.

I would next beg more particularly to advert to the opinions of your second correspondent. He says that I am a defender of the materiality of the mind, yet "*fearing* obloquy," admit the immateriality of the soul. I thank the author for the reason which he has so gratuitously imputed to me. Notwithstanding his liberality, however, I must still lay claim to its proceeding from a more honourable impulse. I have no sense of duplicity in my own mind, which would lead me to arraign without good grounds the intentions of others. The weight of your correspondent's criticisms are against my considering the intellectual faculties to be the organic material functions of the brain. He speaks also, especially, of the function that I ascribed to the cerebellum; perhaps the terms of my description may not seem to have conveyed an exact signification. I contend that the mental faculties are the organic actions of the cerebrum, that the cerebellum is the seat where the action of judgment becomes sensible, or whence its impulses are sent through the nerves to the different active parts of the frame. I may better explain myself by quoting one or two deductions, which M. Flourens has drawn from his experiments. They are somewhat different to what your correspondent is pleased to state them to be, viz. to preside merely over the forward motions of the animal: that, he will perceive, is the opinion of Magendie. M. Flourens says, "it has been shown that the immediate cause of muscular contraction particularly resides in the spinal marrow and nerves, and that the *regulating* cause of these contractions is placed in the cerebellum;" that is to say, the cerebellum is the immediate *agent* of judgment, or, at least, is the medium through which the impulses of the judgment are transmitted to the voluntary nerves. Hence we take away the cerebellum,—and we take away the action of the judgment. Again, he says, "there exists, therefore, in the nervous system (cerebro spinal system) three properties essentially different; first, the *exciter* of motion; the other, the *regulator;* and the third, the *willer* and the *perceiver*." In having asserted that perception, volition, and all intellectual and sensitive faculties reside, individually, in some certain portion of the cerebral mass, I do not pretend to go so far as (a phrenologist would) to point out the *locality* of any one portion of the brain as possessing any one particular faculty, and that the locality of such a portion of the brain, or that the seat of such an intellect, can be strictly defined by any superficial mark on the surface of the skull—this, I conceive, is barefacedly dogmatical, and I only mean to maintain as my belief, that as some nerves (functionally) possess sensation, as some (functionally) possess volition, as the spinal marrow (functionally) possesses both, as the cerebellum possesses (functionally) the power of conveying the mandates of the will and judgment to the voluntary muscles,---so the cerebrum, functionally, possesses the sense of perception, the sense of thought, the power of will, memory, and all the rest of the intellectual faculties.

Your correspondent in spite of his phrenological science, seems to be frightened by my stating, that the medullary part of the brain possesses all the distinguishing living properties peculiar to the brain, as living brain—organic—functional peculiarities; but if this were not the case, it would be very strange indeed, that parts of so important a viscus as the brain should be organised and have life, and yet not have their peculiar organic functions.

I have heard it admitted that the brain *possesses* these faculties; that is to say, that it is the *seat* of these faculties, (and which, I believe, no one presumes to deny,) and yet, nevertheless, they do not admit them to be its specific organic actions, but that they are the immaterial principle connected with the substance or organization of the brain, through the medium of life,---but we should then (I say) have no function left for the brain. This is a most gratuitous hypothesis, founded not on any thing like proof, but is a mere fugitive supposition, upheld because it favours the old opinion of the immateriality of the mind, to which people are bigoted by habit and education, and by confounding two things which I believe are essentially different, the mind and the soul. We may just as well say, that it is not the function of the nerves to feel and convey voluntary motion to the muscles, that it is not the function of the stomach to digest, that it is not the function of the liver to secrete bile, but that these are powers *seated* in those organs, and *connected* to their substance by the living principle; this would be leaving no action for organic matter, consequently, none for the brain as a part of organic matter.

Your *Divine* correspondent, who, of course, should have learnt by this time that the soul is immaterial, that we are not justified in attaching the idea of *locality* to any thing but what is *material*, cries out for me to demonstrate the relative position of the dormitory of the soul; this caster-out of devils calls upon me to

produce from my museum souls pickled and preserved. Now I would just ask, does this minister display either his *divinity* or his *logic* by such low nonsense? Your last correspondent, accuses me strongly of being dogmatic; for what? First, for asserting that the mental faculties are the functions of the cerebrum; secondly, that all nature is imperfect, having partaken of, or being affected by, the fall of Adam. (I never knew, Mr. Editor, that this could be denied, or that the opinion was discountenanced by Scripture.) Thirdly, that all animals should have ministers, religions, Bibles, and revelations, and should enjoy a future state; this I deny ever having written, as he disingenuously represents; he has represented me to have made use of this expression *unconditionally*, but he has not the candour to say that I mentioned it with these provisoes—if they had souls—and if the mind were the soul (for, that they have minds, certainly he cannot disprove, either by religion, metaphysics, physiology, or phrenology). Now is all this, for which I am accused of being dogmatical, more dogmatical than *his phrenology*, ascribing parlours and kitchens in his brain, for his good and bad propensities?

He proposes the two following questions: Do the educated alone possess conscience? I answer, does he find man in any state quite destitute of education? All men are educated by habit to a certain extent; all men learn by experience to identify things, and to understand their own and other men's actions; if a man has not seen, felt, or heard of a thing, he is not aware of its existence, much less of its properties, for these senses are the inroads, or the means of the conveyance of knowledge to a man's mind. In my last paper I supposed an impossibility, for the sake of argument, a man born and living in total abstraction from the world; such a man would know nothing. Secondly, he asks, do animals possess conscience, do they possess education? I answer, an animal may know if he does differently to what he has been taught to do, and, knowing that, he may shun the observation of man, for the fear of the punishment which he had been taught would succeed to it; the natural timidity of a mouse, or a bird, occasions the creature to shun the observation of man, because they have not been accustomed to be in his presence; just as we should shun a large animal that we had not been accustomed to see and whose powers we do not understand, and therefore our natural timidity may occasion us to suppose dangers, which may be either real or merely imaginary. But systematically accustom any timid animal to the presence of man with impunity to themselves, experience teaches them they will receive no harm, they no longer shun his presence, or, in other words, they become tame; nay, more, we have numberless instances to prove, that by systematically accustoming not only timid but ferocious animals, either to the presence of man, or to that of each other, an influence is created over them, which could only arise from an operation on their *minds*, which enables them not only to associate in spite of what we call natural antipathies, but to associate with satisfaction, and to become attached to each other. Thus we have numberless instances of the lion, and other ferocious animals, being domesticated; and, indeed, there is an example in point, to which any one may refer, who will take a walk to the other side of Waterloo Bridge, where "the cat, the mouse, the hawk, the rabbit, the guinea pig, the owl, the pigeon, the starling, and the sparrow," live together in one cage in perfect harmony and happiness.

Speech constitutes perhaps the greatest link in society; it links men in the closest affinity of friendship, or implacably divides them; it unites our ideas, and links our comparative estimations of men's actions; if animals had this gift, and all their intellectual faculties (which they do possess in limited and various degrees) equally perfect with man, why then I do believe that the existence of a conscience in animals would be as evident to man as his own. Who can tell but that animals have a language (or some means of imperfectly conveying mental feeling as a substitute for language) between themselves; and who can tell but what they are capable (so far as may be necessary for their existence one with another) of estimating and understanding each other's actions, i. e., that they have a knowledge or a conscience adapted to their state of existence; they evidently have relative love, anger, gratitude, and even the powers of recollection, &c. &c., to a certain extent.

I had nearly forgotten your second correspondent's objection to my stating that the "cortical part of the brain is subservient to the medullary part." I answer this has always been a very prevalent, and also a very ancient opinion, amongst some of the best anatomists. The cortical part of the brain is very vascular, so minutely so, that it has been supposed to have been made up of vessels; why is this the case, if it is not *subservient* to the medullary part; the two are continuous, and the probability is, I argue, that the cortical part of the brain secretes some living principle *into* the medullary part of the brain, or is subservient in giving that some living endowment. The medullary part of the brain has no cellular substance, and I believe that the cortical part of the brain is as much the vehicle, or the medium, by which the secreting vessels undergo a minute distribution, as the *neuralema* is to the medullary substance of the nerves;

and is, probably, also the medium, or the seat of some certain secretion, peculiar to the brain, as brain.

Need I flinch from this opinion on account of the taunts of this *anonymous* writer, when I am borne out by the opinion of the most illustrious Morgagni; that the brain is a gland! And now, Mr. Editor, I dismiss my two assailants with every agology for having wasted so much time upon masked antagonists, who have met me with so little argument. Their "cap of darkness" gives them the advantage of coming to the contest with personalities, which are sometimes mistaken for the honester and fairer weapons to which I am obliged to confine my reply, and to which, I am happy to say, I conceive my cause may be fearlessly intrusted. I have only to add, that I should have made this answer at an earlier moment, had not domestic affairs rendered it impossible till now, and believe me,

Your very obedient servant,

G. D. DERMOTT.

MATERIALITY OF THE MIND.

Reply to Mr. Dermott by M. D.

To the Editor of THE LANCET.

SIR,—I feel that I have brought myself into a fearful situation, by placing myself within sword's length of a warrior who leaves to his foes no hope of escape. It is some consolation, indeed, that I shall not die alone; the phrenologist must perish with me; and it is a farther consolation to us both, that we shall not die ingloriously, like the squire of King Rhesus, who, when he had a furrow ploughed through his ribs by the sword of Diomed, just as he was beginning to rub his eyes and look about for his weapons, complained bitterly, and truly not without some reason, of this sort of military quackery—this St. John Long method of securing a patient—this unprofessional style of doing business. To die in any way he thought bad enough; but to die in the dark, without knowing how—to be sliced into ribbands by such "hole-and-corner" surgery as this, was beyond all human endurance. But we shall have no occasion to exclaim with the hapless Squire, "Ἡμεις δ' αβουλως κ' ακλεως ολολαμεν," for falling by the hand of the mighty, the light of our fame will surround us. We shall be "pickled and preserved" among the trophies of his prowess; and then, though we shall not be able to say, *Exegi monumentum ære perennius*, we shall at least have inscribed on our "four gray stones," the less proud, indeed, yet still pleasing memorial, *Non omnis moriar*.

But I must leave the phrenologist to shift as he best may, and look to the charges which are to prove fatal to myself. I am accused of inconsistency: I reply, I am a *man*, and inconsistency is a part of my charter. Why, then, should Mr. Dermott quarrel with me, as if my inconsisency were an infringement of his patent? My first act of inconsistency is this; I beg him to give some explanations, and yet I desire to hear no more of his "sublime inanities." Inconsistent mortal that I was! to ask Mr. Dermott for explanations, and yet not desire to hear "sublime inanities," when I might have known so well, that, with *him*, these are just one and the same thing, and that it was impossible for *him* to give the one, without giving the other also.

He has paid me for my inconsistency, however; for of the explanations which I asked, he has given nothing, while of the "sublime inanities," which were not required, he has treated us to a new edition, with additions and improvements. To his previous doctrines he now adds this, "That it is rational to admit that the soul, in a future state, shall be responsible for the actions of the mind in the previous material existence, because it is a continuation of the same individual's existence, only in a different state or form." Very rational, no doubt, that the soul should be responsible for actions of which it had no knowledge, and over which it could exercise no control—the actions of a mind with which it did not enjoy even a *sensible* co-existence. But as his theory, in its former shape, seemed to bear rather hard on the doctrine of human responsibility, this piece of rationality was necessary to remedy the defect. I am glad that *divines* are guiltless of this rational doctrine; and it is to be hoped that metaphysicians will take the hint, and modify their views of "personal identity," which this discovery of Mr. Dermott simplifies wonderfully.

But where is the explanation for which I was so anxious? He told us, that

"Bibles, revelations, ministers, religions," are totally useless, as far as *mind* is concerned; and he told us that the *soul* has no actual or sensible existence, till it is far enough beyond their reach. Leaving Bibles, revelations, and religions to shift for themselves, I very naturally inquired what was to become of the ministers; what possible advantage the world could derive from the existence of that tithe-taking, benefice-hunting, mammon-loving, time-serving, beef-eating biped, a parson, who cannot, I humbly suppose, be of the slightest use to a soul which has no sensible existence in this world. This, he says, is a false deduction; but instead of showing that it is false, or by what possibility it can be avoided, he just pops me into his mortar, and beats me black and blue, nay, pounds me into paste, well knowing all the while, that I cannot imitate the worthy old philosopher, who, when undergoing a similar discipline, cried out, "Work away, my lads, it is only the *case* of Anaxarchus that you are pounding; Anaxarchus *himself* is beyond your reach." He knows very well that it is just Anaxarchus himself that he is so unmercifully mangling; and then, when he has not left a whole bone in my body, he tells me that he has a very great reverence for the clergy! That may be, but that is not the question. I did not ask him with what degree of reverence he may be pleased to honour the clergy, but what they are good for in this world. It would surely have been easier to answer this question than to be at the trouble of giving me so remorseless a drubbing. Does he fancy that the world will necessarily suppose ministers to be very useful beings, just because he is pleased to have a great reverence for them, nobody can guess why? Having paid for my curiosity, however, and hoping that neither he nor any body else can answer my question, I shall make no farther inquiry on the subject.

"When ignorance is bliss, 'tis folly to
be wise."

Another proof of my inconsistency is this: I have celebrated his opinions for their *rarity*, and yet have characterised them as *trite*. O *rare!* Let him consult a certain *rare* work, which is in every body's hands, entitled, "A Dictionary of the English Language, by Samuel Johnson," and then he will know, what nobody else needs to consult a dictionary to learn.

So much for my inconsistency. He has tried to fix upon me the guilt of two verbal inaccuracies, which could have done no good to his cause had he succeeded; and the only result of the worthless attempt has been to show, that there may be some very simple matters which a very profound physiologist may have yet to learn. By the way, does not Mr. Dermott himself at times condescend to make some titubations of the kind that he charges on me? He calls my paper "*incomprehensibly* inconsistent." Very likely it is so; but will he have the goodness to inform us by what means he determines the consistency, or inconsistency, of that which is incomprehensible? It will make an addition to our canons of criticism, well worth all his physiological discoveries. This word-catching, however—this living on syllables, I willingly leave to Mr. Dermott, who, after all, does not seem to be very eminently qualified for it. Were I to draw out in array all his real, palpable, and glaring inconsistencies and inaccurcies, not of expression, but of principle and opinion,

"Adeo sunt multa, loquacem
Delassare valent Fabium."

But this is not my design.

I am also guilty of attempting to rob Mr. Dermott of his well-earned laurels, and he is very angry at me for supposing, that his opinions are not the result of his own discoveries. Truly, the supposition was natural enough. If I meet a man loaded with nettles and hemlock, I naturally suppose that the rope, in which he has them bundled, is his own, but that the weeds themselves he has picked up, where they grow in rank abundance, at any hedge side. If, however, he chooses to be angry with me for the supposition, and insists upon it that they are all the produce of his own garden, I may wonder that he should keep a garden for such a purpose, but certainly will not quarrel with him about the proprietorship. Now I knew the most of Mr. Dermott's opinions were just as common as the above-named weeds, and, therefore, I naturally supposed, that the "fustian bag" above was his own. He denies having collected them, however, and insists that they all "spring solely from his own observation." May be so: it is a pity that so much good observation should be wasted to so little purpose.

I am farther charged with making a statement that I cannot know to be true; for I accuse Bichat and Lawrence of drawing conclusions which physiology does not sanction, while I admit, in the same paper, that I know nothing of physiology! and, therefore, cannot be supposed able to judge of the veracity of what I state. Marvellous presumption in me, no doubt. But is not Mr. Dermott himself, here sinning against logical orthodoxy, and (by no means for the first time) drawing a conclusion from premises which do not sanction it? If a man should tell me, that by means of physiology, or of all the *—ologies* put together, he can prove that the moon is made of green cheese, must I really take a regular course of all the—*ologies*, before I can be entitled to laugh at the absurdity? Or, to take a somewhat different *course*, must I just put a cheese-

piercer in my pocket, and, borrowing Astolpho's griffin steed, if he be still fit for service, or, begging a friendly cast of Daniel O'Rourke's eagle, take a trip to the moon, in order to ascertain, by actual experiment, whether she is made of green cheese or not? Mr. Dermott, with all his knowledge, might surely know this, that without knowing any thing of physiology, I may, nevertheless, very well know, that there are some propositions which physiology cannot sanction; and among these I have no hesitation in placing his proposition with regard to the dormant state of the soul. Indeed, in deducing that proposition, he departs as widely from philosophy as he does from theology. In proving the materiality of mind, I doubt not that he has erred, but no fault can be found with his method of proceeding. He has observed his facts, and then drawn his conclusion. That some inaccuracy has attended his observations, or that some paralogism has crept into the reasonings by which he deduced his conclusion, I cannot doubt; but still his method is fair and philosophical. But in proving the dormancy of the soul, how does he proceed? Physiology can tell him nothing about even the *existence* of the soul. This he learns from a different source of information—the Bible, which tells him that there is a soul, and that that soul is a living, active, and improveable being. He takes *one half* of this information, and admitting from the Bible that there is a soul, he concludes from physiology that the *other half* is incorrect, and that the soul is a non-sentient, dormant, and consequently, I suppose, an unimproveable being. Now in this he is guilty of a double error; for, in the first place, if the Bible alone can tell us that the soul exists, then the Bible alone can tell us how, or in what state it exists. To suppose the contrary, is the same error that the engineer would commit in physics, who should attempt to lead the stream higher than the fountain; and, in the next place, while he deduces the dormancy of the soul from physiology, he has not produced the facts that prove it. I challenged him in my last to produce these facts. He could not help seeing this to be my meaning; but he does not like to say his catechism: he chooses, therefore, to be offended at the manner in which the question was put, and, calling it "low nonsense," dismisses it. I now repeat the question, and, with all due gravity, I challenge him to produce a single physiological fact, by which the dormancy of the soul can be legitimately proved. And he can have no pretence whatever for treating this challenge with affected contempt; for I place it in the pages of a journal in which it will meet the eye, not of hundreds, but of thousands of men, as deeply read in scientific lore as Mr. Dermott himself, and to whom the honours and the interests of science are not less dear than to him; men who will not be slow to overwhelm the uninitiated intruder into scientific mysteries, by producing the facts, *if such exist*; but who, I doubt not, on the other hand, will not permit their souls to be reduced to the state of a nonentity in this world, either by the *dictum* of Mr. Dermott, or by his allegation of facts, the weight and the bearing of which, my professional habits do not enable me to estimate. To them I willingly commit this appeal, well assured, that as the volume of Nature and the volume of Inspiration proceed from the same Author, no real discrepancy will ever be detected between them, but that, on the contrary, the better both are understood, the more clearly will their perfect harmony be seen. In the mean time, Mr. Dermott is guilty of coming to a conclusion which is directly in the teeth of one of these authorities, and which he has not shown to derive any support from the other.

Do, my dear Sir, lend me your patience—I beg yours because my own is already "flaunting in rags"---and I will trouble you no more on such an occasion; but the catalogue of my iniquities is not yet full. And what, think you, is the crime of which I am next to be proved guilty? Nothing less than that of misrepresenting Mr. Dermott. This, one would naturally think to be an impossibility. His readers would, doubtless, suppose that he might safely defy the most consummate master of language to place his opinions in a more ridiculous point of view than he himself has done; yet this apparent impossibility, it seems, I have had the wickedness to attempt, and the ability to accomplish, for thus saith Mr. Dermott: "Now for his honesty. He wishes to represent me as having stated, that 'material and spiritual things are so different, that they cannot be existing in a state of association.' No impartial person, who reads my paper, will suppose that this is the doctrine I inculcate; on the contrary, I have affirmed the possibility and the certainty of a co-existence, but deny a *sensible* co-existence." On this subject I feel some temptation to read him a lecture on the influence of creed upon conduct,---a lecture which, whether he has a soul or not, should make his body ache to the back-bone. He has both furnished me with a text and given me provocation to use it; but I forbear, and would merely warn him to be more cautious for the future; it may not always be his fate to meet with so sparing an opponent.

I charged him with saying, that material and spiritual things were so different that they could not associate. He says this is misrepresentation, because he maintained their—what? their *association?*—No, but their *co-existence*, and that not

a *sensible* co-existence. I beg again to refer him to the *rare* book, to which I have referred him already. Does he there learn that *co-existence* and *association* are equivalent terms? That must be rather a Mezentian sort of association, which takes place between a living active body and a non-sentient dormant soul, which, till the body be dead, has no sensible existence—a kind of Castor and Pollux brotherhood, where the death of the one is essential to the life of the other. I beg to ask him, does the soul in any way affect, or is it in any way affected by, the body? If he answer this question in the negative, then he denies their association; for what association can that be which takes place between two beings which no more affect each other than if neither existed? If he answer this question in the affirmative, then it is obvious that the soul cannot be insensible, and the whole rickety fabric, formed of a heterogeneous mass of ill-assorted crudities, comes tumbling about his ears. Happily for him, when it does fall, there is neither a beam nor a stone in it of sufficient weight to crush a fly.

I charged him with maintaining, that matter and spirit do not associate, because, if he understood his own notions, (of which I have very considerable doubt,) he must see that this position is essential to their existence, and whether he had ever expressed it or not, must be attributed to him. Let him admit the association of matter and spirit, and he must awake from his dream about the dormancy of the soul.

I attributed to him this position, because he has expressed it in the strongest terms that he could find. Will it be believed, that the very man who accuses me of dishonesty, for attributing this notion to him, actually penned the following words?—"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.*" Something, besides the soul, must have been in a dormant state in him, when, in the face of this explicit declaration, he ventured to produce the above-quoted sentence from my paper as a misrepresentation. I have stated his opinions in his own language, as nearly as possible; I wish he had done the same by me: this may be misrepresentation for any thing that I know, for not a few, in this scribbling generation, undertake to write who are but poorly furnished with the means of giving expression to their opinions; they "mean not, but blunder round about a meaning." If Mr. Dermott choose to occupy a place among this class of writers, that is no fault of mine; in the present instance, he has expressed himself with sufficient clearness.

And, after all his vapouring about my mirepresentation, what is the result? He neither does deny, nor dares deny, the opinion that I attributed to him, but tries to fix on me the stain of dishonesty, by an absurdity so gross, that one may charitably hope this is his first attempt of the kind, and that, from his signal failure, he may be induced to make it his last. I charge him with denying *association*. Oh, says he, this is dishonest, for I maintain an insensible *co-existence*. I charge him with denying that man is a *chalk*-eating animal. What a past-saving rogue is this, quoth Mr. Dermott, for did I not expressly maintain, that man is a *cheese*-eating animal?

I am also accused of misrepresenting his *motives*. He should have said how, or where, for I cannot recollect that I mentioned his motives, nor would I even now undertake the task of guessing what they were. That he had motives for palming on the world some worn-out absurdities, in the shape of *rare* discoveries, must, I suppose, be taken for granted; but what they were I cannot even conjecture; and should any one at this moment lay his hand on Mr. Dermott's papers, and say, *quorsum hæc tam putida?* I should be obliged to own myself effectually puzzled.

I am also guilty of personality, it seems. He is, of course, too dignified to reply to my personalities, but he declines even to offer any proof of their existence. Of inconsistency he has offered *two* examples—of misrepresentation *one*—examples which might make a figure in the annals of the wise men of Gotham; but of personality, he produces none. I must therefore, not to be outdone by him in generosity, ingenuously confess the truth of the charge. I confess then, that *when* I represented Mr. Dermott as a wretch fitted, by his "venom" and his "dirty splashings," not only to associate with "toads and frogs," but to derive enjoyment from their society, and insinuated that he is a disgrace to his profession,—*when* I denounced him as destitute of consistency, of honesty, of meekness, kindness, and god-like grace, and as devoted to falsification and misrepresentation, &c. &c.—*when* I decked him with these flowers of rhetoric, and garnished my language with the peculiar idioms of a certain nation which inhabit a particular region of London, furnishing the tables of its inhabitants with some delicate dishes, and their style with sundry piquant embellishments,—*when* I did all this, I confess that I was taking a most ungenerous advantage of Mr. Dermott, who, by having published his name, is ne-

* A babble about nothing,---when it is understood the word *developed*, was here accidentally omitted by me; the tenor of my paper proves that this was my meaning.

cessarily precluded from the most distant approach to low personality or vulgar abuse, and is obliged, rigidly, to confine himself to fair argument, and to the use of such language as may become a gentleman, and a philosopher. *If I have done this*, then my apology must be, that it is the *first* time that ever either the paucity of my ideas, or the poverty of my language, compelled me to stoop so low, and it probably will be the *last*. It is some consolation too, that from the impatience which Mr. Dermott manifests at the supposed advantage, *in this respect*, which the phrenologist and I derive from our "cap of darkness," we may, without breach of charity, suppose, that had he not incautiously laid his own "cap" aside, even *he* might have been tempted to use language not greatly more refined than that of which I have just given a specimen. Let him not then regret that publicity of his name which has proved so wholesome a restraint, and saved him from such a degradation; and let him be assured, if such language offend his delicacy, that should I ever find any composition of mine fringed and embroidered with such holiday terms, not even "Fancy's fondness for the child she bore," shall redeem it from the flames. There is a certain proverb, addressed to people who live in houses of glass, which I would recommend to his serious consideration.

He has read me a homily about what I shall find in the Bible; I thank him for it, and hope to profit by it. Allow me to offer him a little advice in return. Let him learn to command his temper; he is extremely angry at me for twitting him with bad jokes and poking him with a dull sword, borrowing his illustration from some scene in *King Lear*, with which I am not acquainted, having read only Shakspeare's play of that name. He has a singular taste. Were I doomed to be twitted and poked, I should beg, above all things, that the jokes might be bad, and the sword dull; and then, instead of putting myself into a passion upon the subject, I would just take the first leisure half hour that occurred, and amuse myself with reducing the dislocation of these hapless jokes, and giving some edge and point to the dull sword; and then, having fitted them for service, I would try to give my twitter and poker such a twitting and poking as would, if possible, make him think it necessary, before he visited me with any more of his twittings and pokings, first to ascertain whether his own mail were girded with sufficient firmness. This, I humbly conceive, Mr. Dermott would find more pleasant than to seize his club, and with one furious blow crush his opponent's head as flat as a pancake.

He is angry too because I did not assail him with grave argument. I really could not think of calling in the aid of serious reasoning, and still less of appealing to more sound authority in such a case. I could not think of breaking a lance, where to "man a rush" seemed amply sufficient; of "breaking a butterfly upon the wheel;" or of erecting a steam engine to drive a fly-flap. It appears to me that to take up his visions seriously would have

"Resembled ocean into tempest wrought,
To waft a feather, or to drown a fly."

I recollect too a good old saying—

"Ridiculum acri
Fortius et melius magnas plerumque secat res."

If he were of a different opinion, why did he not, instead of letting his anger get somewhat the better of his discretion, just simply produce the facts which establish his views of the soul? How chopfallen would the "caster out of devils" then have been!

Let me advise him, too, to stick to his own profession; it is a noble one, and, if he mean to attain eminence in it, sufficient to occupy the whole man, and the whole life of man. His ambition to enrich his mind by the acquisition of extra-professional knowledge, and to instruct *divines* how to read the Bible, I should, probably be one of the last men in the world to repress; yet I would remind him, that the Muses, though very fair and very fascinating, are, at the same time, very jealous old girls; and notwithstanding the *vinculum* and the *cognatio*, by which Cicero talks of their being united, I suspect they live in no great domestic harmony. Let him attach himself exclusively to *one* of them, and he will find his affection warmly repaid. She will unlock for him her most sacred fountains, and will lead him to her most secret bowers; she will enrich him with all her treasures, and will adorn him with all her honours; but let him not forget, that there is hardly one among a hundred of her lovers in whom she will forgive the slightest flirtation with any of her sisters.

Let him attend to these hints, and then, I think, I may venture to promise him that success, to which, notwithstanding some present crudities, I hope he is capable of rising; and which, notwithstanding the malignity by which I must of necessity be actuated, I most cordially wish him.

Mr. Editor, our worthy friend, Mr. Dermott, has laid himself so very invitingly open to the lash, that it was hardly in human nature to resist the temptation to give him a little gentle titillation, by way of admonition. To you, who now and then apply the lash with inimitable dexterity and home-peeling power, and who, by means of it, are razing out many a rotten opinion, I need not say, with how

much more intense severity it might, in this instance, have been applied. Having written these remarks, it follows, as a mere matter of course, that I should transmit them to you. You are, however, probably tired of the subject; if so, then you may just toss this paper into your *dunce's den*, and leave Mr. Dermott to enjoy the triumph of having quashed the inconsistent, misrepresenting, and abusive parson.

I am, your most obedient,

M. D.

Belford, June 25, 1829.

ON THE IMMATERIALITY OF THE MIND,

And its Identity with the Vital Principle; and on the Constitution of the Soul, in Reply to Mr. Dermott.

By John Thomas, *Esq. Demonstrator of Anatomy.*

The constancy with which you advocate free discussion, and the desire you often express of eliciting truth, persuade me that apology for again troubling you will be needless, and induce a belief that you will provide, without solicitation, a corner in your journal for the following remarks.

In your Number for May 23d, is an excellent paper "On the Functions of the Brain," by Mr. Dermott, a paper containing observations evidently the result of much thought, and which certainly shows that he possesses a metaphysical mind, which by all, I believe, is considered as of the highest order of intellect. I confess I hesitate to enter the lists of controversy with one of such mental capacity, and endowed with so much acute perception. I hesitate, I say, when I consider this; but, on the other hand, when I reflect that it is a duty imperative on every one to be vigilant in the cause of truth, and where he *thinks* he perceives the encroachment of error to dispute its progress, and make a stand against it, my hesitation yields to a sterner feeling; and though the risk of defeat and contumely glare on me, I dare the contest, persuaded that my discomfiture will be the result of the victory of truth. I venture, therefore, with these views, to dissent from the opinions of Mr. Dermott, and to state, that after the most deliberate consideration, I believe them to be quite at variance with *revealed* truth. Without, then, pretending to be wise above what is written, I shall, in this paper, *first*, present your readers with what appears to me to be the interpretation of Mr. Dermott's theory; *secondly*, give as concise a history of my own, as is compatible with distinctness; *then* raise objections to it, which I will endeavour to answer as they arise; and, *lastly*, conclude by some *general* observations, more *particular* ones being precluded by what has gone before.

Mr. Dermott's theory then appears to me to resolve itself into the following particulars:—

I. That the *brain* is the sole originative cause of thought, and, therefore, "it is one and the same thing as the mind," which, for this reason, he calls "a material principle."

II. That this "material principle" is common to all animals, and that the only difference between the brutes and man as an animal is, that in him this principle is more perfectly developed than in them.

III. That the *essential* difference between man and brutes is, that the former has superadded, or "attached to his existence," a principle which, in common parlance, is termed the soul; which is not conscious during this life, but is cradled up, as it were, or preserved in embryo in some place, (in the pituitary gland, for this is well defended from rude aggression?!) but "not demonstrable."

IV. That this material principle is the "ostensible representative" of this undeveloped, unconscious, "dormant," and insensible soul during man's terrestrial existence. That though *not free* to act, nor sensible to moral or physical impressions in this life, *it is responsible* for the reprehensible acts of the material principle or brain; for which, though it could not control them, it receives retribution when it awakes from its torpor, or comatose condition, in the world of dread reality; and "because it is the continuation of the same individual's existence."

This, then, appears to me to be the construction which, without any straining, may legitimately be imposed on Mr. Dermott's "theory." And here permit me to observe once for all, that if Mr. Dermott is of opinion I have misinterpreted his sentiments, I hope he will attribute the error, not to wilful misrepresentation, as that I utterly disclaim, but rather to the hebetude or obliquity of my understanding. I shall proceed now to give as concise a history of my own theory as is compatible with distinctness; and in doing so I may premise, that any absurdities it may be thought to involve, are attributable

solely to me, as I have consulted neither books nor persons on the subject, it being purely the result of my own speculations, upon what I have thought substantial grounds.

I. *First*, then, I maintain that the vital principle operates immediately upon the brain, and intermediately upon all other parts of the human system; that the brain is the machine, as it were, by which the operations of the mind are made manifest; and that this mind is identical with the vital principle.

II. *Second*, I cannot admit the ubiquity of the vital principle, but I do the universality of its influence; and I believe that the principle of life itself resides in the brain, and no where else.

III. *Third*, I grant the degree of perfection of mental *manifestation* depends upon cerebral development, in the same way that perfect action in a steam engine does on the excellence of its works; but I cannot admit that the brain is the mind, any more than I can that the engine, whose function is motion, is the fire or steam by which it is caused to act.

IV. *Fourth*, I deny the identity of the vital principle in man and the inferior animals, and, therefore, I propose to distinguish that which actuates the former by the term *human principle*, and that by which the latter are influenced as the *brute principle;* and this, I believe, is perishable, but the other is immortal.

V. *Fifth*, but this immortal, human principle cannot exist separate from deity, unclothed by, or independent of, matter; it is not the soul, however, but is a constituent of what will hereafter form an incorrupt and immortal soul.

VI. *Sixth*, I cannot agree with Mr. Dermott, that what is commonly called the soul is "dormant during life," or that it has any "representative." I believe that the vital principle, which is to be the quickening principle of a new and glorious body (*σῶμα*) after death, is of itself active and energetic during its mundane existence; that it conceives, reflects, and acts, and for its conceptions, reflections, and actions, is alone responsible, and will be rewarded according to the deeds done in the (*σῶμα ψυχικον*) animal or mortal body.

VII. *Seventh*, I believe the soul (by the soul here, I mean that which shall exist after death) which is scripturally denominated (*σῶμα πνευματικον*) a spiritual *body*, is substantial, i. e. an immortal creature, endowed with the properties of matter, inimitably beautiful, and the perfection of the Creator's works. I use the word spiritual (*πνευματικον,*) as I believe it is generally used by the sacred writers when speaking of the body with which we shall rise again, in opposition to animal and carnal (*ψυχικον και σαρκικον*).

VIII. *Eighth*, I cannot believe with Mr. Dermott, that when the brain dies, the "individual's existence is continued" by the "dormant soul:" it is not scriptural; I think it is unphilosophical and untrue. The soul, or, as I call it, the immortal human principle, I have said is coeval with the body, and always active; I believe, therefore, that at death it drops, as it were, the husk or shell by which it is inclosed, and becomes reinvested in a new body, (*σῶμα πνευματικον,*) subject to no deterioration, and that its *own* existence is continued, freed from connexion with the (*σῶμα ψυχικον*) animal or mortal body, which is impure, and has stamped upon it, like all things terrene, decay and dissolution; and,

IX. I believe that this immortal body (*σωμα πνευματικον,*) similar in appearance, and, in fact, in every thing sufficient for identity with the mortal body (*σῶμα ψυχικον,*) will hold the same relation to surrounding objects in the world to come, as Adam our great progenitor did at his creation and before the Fall; hence I infer that heaven is a place, and not a state of being.

These, then, comprise the substance of my opinions, which are diametrically opposite to those of Mr. Dermott. I shall proceed now to raise as many objections as I possibly can; they will be founded on established opinions, Mr. Dermott's theory, and the peculiarity of my own views, and I shall endeavour, as they arise, to answer them; but this I expect not to do to the satisfaction of every one, I shall content myself, therefore, with the attempt, and leave your readers to their own decisions.

Objection 1.—How can the mind be identical with the vital principle, seeing that the principle of life is said, by high authority, to pervade all parts of the system; if the identity be admitted, then mind must be universal, and is it not absurd to place mind in the stomach, liver, lungs, &c.?

Answer.---The assertion that the doctrine of the omnipresence of the vital principle is believed by high authority, adds nothing to its validity, from the fact, that authorities the most formidable differ among themselves. For my own part, as I have before stated, I cannot admit the ubiquity of this principle; if it were present in every part of the body, why need there be such a plentiful distribution of nerves to all the regions, and these nerves, too, ultimately referable to the brain and spinal marrow? These nerves are known to preside over voluntary and involuntary motion and sensation; but they themselves do not determine if motion or sensation shall take place in certain parts; if they did they might not please to be consentaneous in their operations, whence much confusion might arise. But they convey to the mind intelligence of exter-

nal circumstances, upon the knowledge of which it frames its resolutions, which it causes to be enforced by a class of nerves subservient to its purposes. Hence we perceive that the power which presides over the animal, is situated at the confluence of the nerves, is acted upon, and acts. I say, then, it resides only in the brain; and that it does not in the spinal marrow, is proved by the fact, that in fracture of the vertebræ, with depression, all voluntary motion and sensation cease below the injured part;---that it does not reside in the solids, is proved by the fact, that if the nerves distributed to a part be insulated, the same thing results; but it is still alive; the part lives, not because the principle is innate, but because its influence upon the circulatory system continues, which causes the vessels still to convey the pabulum of life to it for its support: stop the flow of blood to the part, and the consequence is its death. The residence of the vital principle being established in the brain which is its palace, where it sways the sceptre of its sovereign will, I come now to consider the question of its identity with the mind. I think I have shown that the vital principle does not exist in every part of the body; if, therefore, I prove the identity of the mind with it, I shall have completely answered the question, as far as its absurdity is concerned; but in order to save time, I will raise the next objection, and endeavour to answer both.

Objection II.---Is not all animal matter influenced by, and subject to the same laws; and do not like effects proceed from like causes; and if so, can there be a difference between the vital principle of brutes, and that of man, seeing that they, in their operation on matter, produce similar results?

Answer.---There can be a difference, and the same effects may be derived from causes the same in some respects, but dissimilar in others. For example, there may be two watches, one of which indicates the hour and minutes, the other, in addition to this, points out the seconds: now the power which moves the hands in both is similar, since they produce the same results, namely, those of telling the hours and minutes; but they differ in this; that the latter watch has a power superior to the former, and can, therefore, produce a different effect. So, I conceive, it is with the brute principle, and the human principle; for the power of one is superior to the other, and this difference, I believe, depends upon the *two dissimilar sources* from which they were produced, and not, as is by some supposed, upon the difference of organisation alone. If we peruse attentively the history of the animal creation, as recorded by Moses, we shall there find a very circumstantial account, which points out so clearly, "that every one who runs may read," the origin and cause of difference between the two principles. "And God said, Let the *earth* bring forth the living creature after his kind;" "and God made" (or spoke into existence) "the beast of the earth;" "and God saw that it was good." Moses then, in chap. i. ver. 26, relates the creation of the first human pair; but not satisfied with a general account, he details more particularly the manner in which man was created, and how he became a living soul. "And the Lord God formed man of the dust of the ground, (Gen. chap. ii. ver. 7.) and breathed into his nostrils the breath of life (*το πνευμα του βιου*); and man became a living soul, (*ἐγένετο εἰς ψυχὴν ζῶσαν*)." Now the creation of the inferior animals is very analogous to that of the vegetable kingdom; vegetable life and brute life were both conferred *by the command of God;* "and God said, Let the earth bring forth grass, &c.;" but in the creation of man, the Deity condescended "to breathe into his nostrils" a part of his own pure essence; he chose to animate man's body, which he had formed from the dust of the ground---"*divinæ particulæ curæ;*" and since he had made man "*in his own image,*" he determined to confer on him such a principle of life as should be not only sufficient for animal existence, but which should partake of his own divine nature, and thus, at once, supply him with vitality, mind, and immortality. Is it then, I ask, irrational to suppose the mind identical with the vital principle; and that the human principle and the brute principle are not the same, seeing that they are derived from two such different sources---*the one* from the *earth* in common with vegetation, and *the other* from *God* himself? He might indeed have commanded man to exist, when he said, "Let the earth bring forth the living creature;" he might, too, have bestowed upon him immortality; but no, he willed a higher relationship than that for man, he inspired into him a particle of his own nature, and thus formed him the pure offspring of himself.

Obj. III.—Do we not say "soul and body;" how then can the soul be a constituent of the soul which exists hereafter; is it not a pure elementary spirit—an entity which can exist independent of matter, though, indeed, connected with it during life; if so, is it not absurd to make it a constituent of a new creature?

Answer.—The word Σῶμα, I find, is used by the writers of the New Testament, both when they speak of this mortal body, and of that which man shall possess after death. It is a word deduced "from the Heb. שׁוֹם to place, as being the *place* of the soul." Now if the sacred writers use the word *σῶμα* indiscriminately, when speaking of the animal and spiritual bodies, may we not infer that the *σῶμα* in

both instances is for the purpose of enclosing or containing the responsible and immortal principle of man? It is not my intention to discuss the nature of spirit, or to enter into inquiries "of entity and quiddity," or such like metaphysical speculations; my object is to show that the spirit of man, the human principle, or by whatever name it may be called, at death merely quits a corruptible for an incorruptible body (σῶμα). Death I consider as nothing more than a purifying process; one by which the immortal constituent of man is freed from a tainted incumbrance. Paul's illustration of the resurrection, 1 Cor. xv., I think is simple, beautiful, and very much to the purpose; some, he says, will inquire "ποίῳ δὲ σώματι ἔρχονται;" with what *body* will they (οἱ νεκροὶ, the dead) come? And adducing the example of a grain of wheat, he replies, "οὐ τὸ σῶμα τὸ γενησομενον πειρεις," thou dost not sow that *body* which shall be hereafter, i. e. the mortal body is not that body which will form the place of the immortal principle, any more than the exterior of a grain of wheat is the plant which grows from it, and afterwards produces similar grains. No; man's body first dies, and then the vital principle which once animated it, forsakes it for ever. It appears to me absurd to suppose that the mortal body ever rises again; one might be pleasant here in favour of dissection, but all that could be said may be easily imagined by the most common understandings, therefore we will let it pass. At death, then, the spirit leaves the animal or mortal body, (το σῶμα ψυχικον,) and becomes invested in a new, incorruptible, and spiritual body (το σῶμα πνευματικον); this, therefore, is what I understand by the immortal soul, or, in Mr. Dermott's words, "the continuance of the individual's existence." Was not Adam, before his fall, thus constituted, and if that unfortunate occurrence had not taken place, would he not have been immortal? This is undeniable. What was Adam but a particle of the Deity embodied in a pure and undefiled receptacle; and what is man now, but the same divine principle contained in an impure place; and what is the immortal soul, but the particle of Deity re-embodied in purity? I believe, then, that an immortal soul consists of the human principle, and a body which is incorruptible, (το σῶμα πνευματικον,) that it will inhabit a place, and be in its relation to external objects in circumstances similar to Adam, when he reigned sole lord over his domains in Eden. With these views, then, is it absurd to make the human principle, or, as it is in common discourse called, "the soul," a constituent of a new creature? I think not; but we shall see, "when all things have passed away and become new."

Mr. Dermott's opinions, I must confess, tend very much to materialism; by this I mean that they encourage the belief that when matter ceases to live, man's spiritual part dies also. It is true he provides a "dormant" being which is to spring into life at death, loaded with the offences and crimes of thinking matter, for which though it did not commit them, it suffers, and for no other reason than because "it is the continuance of the same individual's existence." Let me not, however, be misunderstood; I do not say that Mr. Dermott attached this anomalous principle to matter to satisfy the fears of some, or to allay the conscientious qualms of others, or that he did it to ward off the imputations likely to be "attached" to him, were he to form a theory of mind which divested man of his immortality; I do not say this, but still, if his theory be taken simply upon its own merits, I think it authorises the view I have taken of it. As for the mind being the brain, I cannot admit that; shall we say that the relation of certain wheels in a machine, is the machine itself? Shall we then say, that the actions of the heart, lungs, and brain, are these organs themselves? No; but this I think we may affirm, that the brain is an organ composed of various parts, each endowed with a certain faculty, and is acted upon by a principle which causes it to produce various manifestations. The perfection of these results, I agree with him, depends upon the development of the brain; in the same way that the more perfect a piece of mechanism is, the more complete will be its functions, at the same time it is not independent of the moving power, as I have shown above.

Thus, Mr. Editor, I have endeavoured to discuss with candour, the subject to which Mr. Dermott's opinions have given rise; whether I have succeeded in establishing my own, and overthrowing his, or have failed in both, I leave with your readers to decide.

1, Dean Street, Canterbury Square,
Borough, June 4, 1829.

THE VITAL PRINCIPLE.

To the Editor of THE LANCET.

SIR,—The early insertion of a former communication has tempted me to trespass again upon your patience, though I much doubt whether you will think the import-

ance of the subject a sufficient apology for its length. I allude to Mr. Dermott's theory of the "organic materiality of the mind." There have appeared sundry objectors to his theory, but none of so much importance as Mr. Thomas, inasmuch as he has superadded to his objections an *original* theory exclusively his own, not having consulted (he says) "either books or persons on the subject." Your last correspondent, Mr. Vines, has confined his observations entirely to Mr. Thomas and his theory, and I have still to learn what Mr. Vines's opinions are, as they have not yet made their appearance; they possibly will, at a future time, as he has promised to continue the subject. Mr. Dermott would make it appear, that the human mind is as clearly a function of the brain, as the secretion of bile is a function of the liver, urine of the kidneys, or any other *material* function of the animal machine; that the cortical part of the brain is 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 and even the nervous system, and in which their effects become perfectly developed.

In this view of the subject Mr. Dermott stops short at the brain as the first cause, the *primum mobile* of the mind; for although he admits the existence of the soul, it nevertheless lies "dormant" during the period of the natural life of the mind, and is only called into "existence" at the death of the said mind, and then becomes answerable for all the good and evil deeds done by the body, with which it has had nothing further to do than quietly to sleep away its time in its own peculiar "dormitory," in some corner of the said body.

Mr. Thomas takes another view of the subject. He "maintains that the vital principle operates *immediately* upon the brain, and intermediately upon all other parts of the human system; that the brain is the machine, as it were, *by* which the operations of the mind are made manifest, and that this mind is identical with the vital principle." But this immortal human principle cannot exist separate from deity unclothed by or independent of matter; it is *not* the soul, however, but is a constituent of will what hereafter form an incorrupt and immortal soul. He cannot agree with Mr. Dermott, that what is commonly called the soul is "dormant" during life, or that it has any "representative." He believes that the vital principle of a new and glorious body after death is of itself active and energetic during its mundane existence; that it conceives, reflects, and acts, and for its conceptions, reflections, and actions, is alone responsible, and will be rewarded according to the deeds done in the animal or mortal body. He believes also that the soul is a substantial body, but spiritual; but he cannot believe with Mr. Dermott, that when the brain dies, the "individual's existence is continued" by the "dormant soul." He thinks that the soul at death drops the husk or shell by which it is enclosed, and becomes reinvested in a new body, subject to no deterioration, and that its own existence is continued, freed from connexion with the animal or mortal body. And, further, that this immortal body, similar in appearance, and, in fact, in every thing sufficient for identity with the mortal body, will hold the same relation to surrounding objects in the world to come, as Adam did at his creation and before the Fall; hence he infers that heaven is a *place*, not a *state* of being.

Here Mr. Thomas involves himself in a world of contradictions. First, he identifies the mind and vital principle as one, but this is *not* the soul. Secondly, he cannot agree that the soul is "dormant" during life, or that it has any "representative." Thirdly, that the vital principle after death is *alone* responsible for the deeds done in the mortal body. Fourthly, that the soul is a substantial body, (but spiritual,) and that at death it drops the husk or shell by which it is enclosed, and becomes reinvested in a new body, freed from connexion with the animal or mortal body. How Mr. Thomas can reconcile these, I am at a loss to conceive. The soul it is which lives after death, but the mind or vital principle (which he clearly separates from the soul) is to be rewarded or punished, as having been the active principle during life. To my mind this is corroborating Mr. Dermott's position, that the soul is dormant during life. He cannot believe also with Mr. Dermott, that when the brain dies the "individual's" existence is continued by the soul; that it is not scriptural, that it is unphilosophical and untrue. I would have advised Mr. Thomas, before making such a sweeping assertion, to have read the Scriptures with attention, and more especially the following words of God himself, the Creator and Saviour: "I am the resurrection and the life; he that believeth in me, though he were dead, yet shall he live; and he that *liveth* and believeth in me, *shall never die*." John xi. 25, 26. This renders it unnecessary to advert to the "unphilosophical" and untrue; for it is most unequivocally asserted by the Deity himself, that the "individual" that lives and believes in him, shall never experience an interruption of existence; and by the mouth of his apostle he declares, that when his natural body dies, the individual continues his existence as a spiritual body. Paul—1 Cor. xv. 44. Therefore Mr. Dermott is strictly correct when he says the individual's existence is continued at the death of the brain, however incorrect he may be, as far as regards the soul's being dormant during life.

It may perhaps be asked, whether (as I seem to differ from both these gentlemen) I have any theory or doctrine of my own to promulgate and support? I certainly believe in certain opinions and doctrines not generally received, but I confess I cannot boast of any originality or exclusive right in them, for I have gathered them from "books and persons," that is, I have adopted those opinions which appear to be founded on facts and reason, and have discarded those that are not so supported; and if prejudice is but put aside, this becomes an easy task, for (in the language of a most truly enlightened author) "when truth is at hand, all things concur in giving it support." By fairly stating my own doctrine, I shall perhaps better show in what particulars I differ from the above gentlemen, and lay it fully open to refutation and confirmation. My belief, then, is shortly this. "That the brain and nerves govern the whole body, intermediately, by a circulation of their own peculiar fluid, as the heart and its vessels build up and nourish the body, intermediately, by the blood. That this fluid is eliminated in the cortical part of the brain, and diffused through the medullary part, "even to the nervous system;" that the presence of this fluid is necessary to the well-being of every the minutest part of the animal machine; that this fluid is receptive of that principle known by the name of life; that this principle, or life, is derived wholly and solely from the Deity, and is continually emanating from him; that it is the soul, or the spiritual part of man (which is indeed the very man, the mind, the individual) that "conceives, reflects, and acts;" that it manifests itself outwardly by means of the brains; that external impressions are made manifest to it by means of the nerves and brain (but this only intermediately); that the soul, or man, is a free agent, receiving good from his Maker as he is *willing* to receive it, and doing evil in proportion as he *rejects* good; that when the existence of the natural body ceases, the man takes on his spiritual existence, and is judged; i. e. he finds himself in that state of happiness or misery, as his own will hath determined (for, contrary to Mr. Thomas's opinion, I look upon both heaven and hell as *states* not places); for so far as the "individual" wills or loves good and truth, so far is he in happiness; and so far as he rejects good, from the love or will of doing evil, so far he is miserable; so that the individual goes into that state, that his love or ruling passion wills him to be in. This then is the doctrine to which anatomy, physiology, nature and Scripture, have brought me to subscribe, for I disagree entirely in the idea of Mr. Vines, that the subject is lost sight of, physiologically, "by calling in the aid of sacred writ." However, it will be seen that much of what I consider to be the truth is to be found in the theories of Mr. Dermott and Mr. Thomas, but that the conclusion I draw from the same facts is somewhat different. Nevertheless, I may be wrong, they may be in the right; and if it can be made appear so, I shall be the first to acknowledge it; but the facts and arguments (at least what I think to be such) upon which I found my belief, cannot be included within the limits of this paper, I shall therefore defer the further consideration of this subject until I understand whether what I have already advanced be thought worthy of an inquiry. In the mean time,

I remain,
Your obliged servant,
June 4, 1829. XX.

PHYSIOLOGY OF THE BRAIN.

To the Editor of THE LANCET.

SIR,—So many communications have appeared in your Journal, on the physiology of the brain, and on the relation it bears to the mind, &c., that it may seem unnecessary to devote another of its valuable columns to the subject; but, as nothing like a satisfactory adjustment of the question has been effected, I hope you will not oppose your influence to its free discussion, by refusing insertion to the present article. As some of the opinions of Mr. Dermott have had no share of the notice of such of your correspondents as have pretended to answer him, and, moreover, as those neglected opinions are the opinions, the truth or falsehood of which it is most important to ascertain, to them my observations will be more especially directed. Mr. Dermott believes in the existence of a soul, but maintains, that so long as organic life continues, it remains dormant and inactive; and asserts, that nothing more than matter, i. e. brain, is necessary to account for all the corporeal and mental actions of man during his sublunary existence. But to prevent any unfairness, or misrepresentation, Mr. Dermott shall speak for himself:—"We take away the cerebrum, and we take away at once the perception, thought, memory; we take away the cerebellum (without the cerebrum) and we take away judgment, for these actions are nothing else than the organic functions of these seve-

ral parts of the brain."—"By exciting the circulation in the brain, its functions, or mental powers, are quickened."—"All the intellectual faculties are the organic functions of the cerebrum."

Now I maintain, that it is impossible for any man, who tells you in sober verity that he holds the above opinions, to be any thing else than a materialist, that is to say, he must believe in the adequacy of matter to the production of all those operations which we are accustomed to term mental, as reflection, judgment, recollection, &c., and the materialist contends for nothing more. In subversion of this part of the doctrine of Mr. Dermott, I shall endeavour to convince him of the truth of the trite position, "That matter cannot think." The arguments which have been brought forward, by the advocates of an opposite opinion, are of two kinds, the first of which runs thus—If the kidneys can secrete urine, the liver bile, &c., why may not the brain produce thought? I shall attempt to show the fallacy of this reasoning. We will suppose that an impression is made on some part of the body, from whence it is conveyed to the brain, through the medium of the intervening nerves. Very well. Now, say those acute reasoners, by this impression, some peculiar and wonderful action is excited in the cerebrum, or cerebellum, or in both, and the subject of the operation thinks; that is to say, when man reflects his soul is not in any manner adjuvant to the nervous mass. Admitting that an impression made externally exerts an influence over the brain, the only possible result of such impression would be, the induction of motion in the organ, (i. e. excitement of its vessels), and the only possible result of this motion would be, the exudation or secretion of some fluid, or the removal of some part of the brain itself, or the deposition of additional substance. Matter can exist in two states only, in a state of motion and in a state of rest. In the quiescent condition, it may be said to be passive and without any influence; and when in motion, it may, to a certain extent, change the situation of surrounding matter; that is, it may, by bounding against them, throw other particles into motion, but it cannot *create* any thing. No man, I think, will object to the position, that matter is incapable of spontaneous motion. Suppose I place a ball in the middle of a room, and, by rolling another ball against it, effect a change in its position; the *immediate* cause of the change of position of the first ball is the impulse of the second, but the remote cause is the soul, which, desiring to move the first ball, makes use of the second, the instrument only, to effect its purpose. A man shall retire to his closet, and call to mind ideas which have, at some preceding period, engaged his attention. Now, supposing thought to be the result of some peculiar movement of the brain, how, seeing that matter is incapable of spontaneous motion, is that action of the cerebral mass established, which is necessary to the before-mentioned intellectual operation, or, in other words, to the exercise of memory? How subtle soever the adaptation or arrangement of matter might be, it is as difficult to conceive that it could produce thought, as that two and two are five, or any other impossibility. As matter, then, cannot produce that which is immaterial, and as our ideas are immaterial, it necessary follows, that there is something else than matter, and this something I call the soul, which is eternal, is at present in some mysterious, and, to us, perfectly incomprehensible manner, connected with a tenement of clay, but which will, hereafter, exist unshackled by all earthly bonds, and which will form what is scripturally denominated the spiritual body.

I now proceed to make a few comments on the remaining arguments which materialists adduce in favour of the doctrine of the all-sufficient power of brain, and which I have quoted from Mr. Dermott into the early part of this paper. Now, admitting that the loss of certain portions of the brain, to all appearance, renders the mental powers of the person sustaining it, imperfect, it does not, by any means, follow that such powers owe their existence to matter only. I maintain, that there is such a thing as the soul, by which I mean that principle, whatever its appellation may be, which enables man to reflect. Now, though we cannot tell what this principle is, we can tell what it is not, and every man who reflects at all must be convinced, that it is not called into existence by matter. I regard the nervous system as the medium of communication only, between the mind and things external. In order that two minds may hold communion together, it has pleased the Almighty to make two nervous systems necessary, so long, at least, as we remain on earth. I say not, that in injuries to the brain, the soul is injured too, or in any manner influenced or changed, but that the brain is thereby rendered less subservient to the uses of the soul—that the isthmus over which it passes to another soul is destroyed. To me it seems an outrage to the understanding, to conclude that if the brain be destroyed the mind is destroyed too; my own individual opinion is, that the thinking principle remains perfect and entire, and that the road alone, leading to and from this principle, is destroyed.

I have the honour to be, &c.

EDWIN FOSTER.

Leeds, Yorkshire, July 8th, 1829.

PART II.*

Mr. Dermott on the Materiality of the Mind, Immateriality of the Soul; and the Vital Principle :—containing his Replies to "M. D——s," Mr. Thomas, and Mr. Foster; also Observations on Dr. Wilson Philip's Theory of the Nervous System.

To the Editor of THE LANCET.

SIR,

Since your insertion of my paper on the two first of the above named topics, various communications have appeared in reply.

On the paper of your correspondent a "Divine," who certainly has assumed the garb, without any ability to sustain the theological character, I shall make some cursory observations, and then pass on to my other opponents, certainly possessing a knowledge of physiology, and who consequently merit more of my attention; a kind of information of which the Divine is entirely innocent. Strange to say, Mr. Editor, this vapourist accuses another of mystification, (an accusation which so admirably fits only himself,) evidently for the purpose of shielding himself from a similar charge. What think you of a person attempting and professing to reason upon a physiological subject, without having brought forward a single fact, as the physiologists have done. I not only state this, but as he has such a mania for *challenging*, "I challenge him" to produce a single fact in support of the immateriality of the mind.

I contend for the materiality of the mind on the ground of physiological evidence, and I assert that if this does not prove fully the materiality of the mind, it at least throws the weight of probability on the material side of the question. I also lay claim to the sincerest credit for believing my Bible, and consequently believing in the existence of an immortal soul, notwithstanding the Divine's *charitable* insinuations to the contrary.

But on the other hand I say, that in all the intellectual and moral faculties of man, we see nothing but the functions of the brain or mind, by the agency of which we are acquainted with the nature, properties, and propensities of the mind of man: that as the functional causes of our actions are referable to the mind, they are not consequently attributable to the soul, *ergo*, the soul must be, in this life, in a state of inactive existence—must have a substitute in this life; the mind—and constituent of the same individual's existence that the soul is. Hence, as the soul's powers or propensities are not in a state of activity, we are unacquainted with its real nature. Should it be objected; how do I know of the existence of the soul, having immediately before denied its demonstrability during life? I reply, behold the BOOK.

I have now met this "challenge" of the "Divine,"—to give my reasons *why* I believe the soul to be inactive or undeveloped in this existence, which he so triumphantly defied me to do; and it would have been much better if this Pharisaical priest instead of breaking untimely jokes, like *Oswald*,† and canting about "ranting parsons—toads in the chimney piece—pickles and preserves—dormitories and nurseries—Shakspeare's Othello—and the moon's being made of green cheese," had combated my doctrine of materiality by physiological argument, or argument which only moderately bore upon the subject. He excuses himself from entering into a serious and consistent discussion of the subject, by saying there is nothing in my papers to contest: now this is disproved by the very fact of persons having advanced arguments against them. What, therefore, is his bare assertion to be imputed to but his non-competency to judge, being no physiologist, and evidently as little of a theologian. Without attempting physiologically to discuss this physiological subject, but leaving it altogether to be answered by those physiologists already alluded to, he saves himself the trouble by at once making the sweeping assertion, that my doctrine of the materiality of the mind must be incorrect, because "there cannot be any discrepancy between the volume of nature and the volume of inspiration, both proceeding from the same author." I admit it—but in order to make this conclusion serve his

† The Divine pleads ignorance of the character of Oswald, because he has read only Shakspeare's plays.—Has the Divine read Lear, or does he ascribe that Tragedy to any one but the immortal bard?

* This part could not be admitted into THE LANCET on account of its unavoidable length.

purpose, he must prove the non-materiality of the mind, either physiologically, or scripturally, i. e. by producing scriptural passages which unequivocally and satisfactorily prove that the mind is *not material;* and that the mind and the soul are identical. This is not to be done by depending upon the ambiguous meaning of a *single* word in a passage, which may be made to apply to the soul, or the mind, or to both, or to animal life, just as it may have been construed by different writers, but must be established upon scriptural passages clearly expressed. Such passages he has not attempted to bring forwards—but what has he done?—Why substituted for them passages from Shakspeare, or from any thing else but the Bible; this is his theology! But is this the right way of arguing a question of divinity? as he asserts materiality of the mind to be. By producing such scriptural unequivocal passages, as I require, he will then prove that the doctrine of the materiality of the mind, or the voice of physiological facts is at variance with scriptural doctrine. But he cannot prove this; nor has he a right to *assert* it till he can establish it as a fact in the most satisfactory way by scripture. This done, we may then, indeed, allow the doctrine of materiality to give way to the voice of divine inspiration.

Mr. Thomas, my abler and fairer opponent, so far from making materiality to be disconsonant with scripture, makes not only the mind material, but the soul itself, nay Heaven, and I suppose Hell; to substantiate which, if he does not bring forwards scriptural passages, he brings forwards scriptural words. And the chief differences between his and my doctrine seem to be—First, That he makes the essential part of the soul, the life of the brain or the mind, and the animal human life to be one and the same thing; and that this animal human life, being mind, has its *only* seat in the brain. Secondly, That this living principle in the human subject, and the living principle in brutes, is quite different in nature; or he would be under the necessity of sending all the brutes into a future existence, which the Divine by way of an extravaganza was very inclined to do in his first paper. I say too, it is reasonable to suppose there are two different principles entering into the existence of the same individual, (do not let me be misunderstood, I do not exclude the soul's co-existence in the first or material world); a material essence or nature for a material world—a spiritual essence or nature for a spiritual world. The scriptural passage, "body, soul, and spirit," seems to express the non-identity of the two: for what can the spirit of man mean but the mind; the word body, being here used I should think in contradistinction to the mind, in allusion to the body's tangible substance? But the elucidation of the identity or non-identity of the mind and soul is not one of the objects of scripture, and as this is the case, the obscurity which is allowed to hang upon this subject is not to be wondered at.

This want of certain information in the scriptures, may depend upon the last-mentioned reason, also the obscurity and poverty of language, the licence available by translators (all of which now-a-days cannot be considered as being inspired), and the frequency of metaphor in scripture. But as to the doctrines bearing on the *prime object* of the Bible, man's duty, there is the greatest possible perspicuity; and in order that no mistake or ambiguity may arise from the above-mentioned causes, the commands and doctrines relating to this are couched in various ways and modes of expression, all tending to one result or to certain invariable maxims that cannot be misconceived. But as to the *nature* of the soul, the poverty of language precludes its description; for were it essential to man's welfare that his immortal part should be described, it would be necessary to create a language for the purpose. Hence we are thrown back upon physiology to seek information as to whether the mind is material. The Divine therefore is acting out of his province in attempting to discuss this subject, for did it admit of theological elucidation I am far from thinking that the divine would be equal to its discussion. I must therefore dispute the correctness of the Divine's deduction, that "as the Bible tells us the soul exists, then the Bible can tell us how, or in what state it exists!" i. e. inform us of its actual and precise nature.—Now I say produce these scriptural passages, by his so doing he will increase my information, and I think that of mankind at large.

Because I believe in the non-development of the soul in this life,—because I believe in the *material* existence for the *material* world, and the *immaterial* existence for the *immaterial* world, he says, I stamp an uselessness on Bibles, Revelations and Religions. This is not only a glaringly false, but a most malignant deduction.

His making the assertion that the two states cannot be the continuation of the same individual's existence, is a great deal for "a parson" to say: we cannot comprehend many of God's works, and a great deal of his economy—the nature of a future state for instance—and may we

not equally be unable to deny, that these two states *can* be in the hands of omnipotence, the continuation of the same individual's existence; would it not be as arrogant in us to do so, as to deny the existence of the soul; for neither the nature of the soul, nor the link or mode of connection established between the mind's present existence and of the soul's future existence, is to be reached or discovered by human reason.

In reasoning *abstractedly* from the knowledge afforded in the Bible, we may deem it probable that a soul exists, or that there is such a thing as a future state: we look to nature, and we know there must be a first cause for all her operations—a creator; we see that man is the masterpiece or the chief work of the creation; and it is a reasonable inference that this creator should establish some relationship between himself and the head of his creation, in order to be properly known and reverenced by man, as the creator—this relationship is religion; which consists of certain injunctions or commands, explained in the scriptures, and which man is to perform. One word as to the observations of this shrewd critic upon the import of the word "trite" and his sagacious advice to refer to Johnson's dictionary to see its signification. Now if he were to do so, I think it would be attended with benefit to himself, for unless his vision be as much distorted as his understanding, he will there find "trite" signifies "stale, worn out," therefore it does not require much etymological elucidation to know that the adjectives "rare" and "trite," have two opposite significations; nor much metaphysical depth to comprehend why these two opposite adjectives cannot be applied to the same thing. It is not very difficult for me to continue as firm as ever, in exposing this *religious* champion's *liberality*, his *honesty*, *good temper*, and a thousand other *graces*.

Ably indeed does he sustain the character of a Christian Divine, when in a public journal he lavishes upon a man of whom he knows nothing, the epithets Knave, Infidel, and Fool,—and that with a meekness only surpassed by his profusion, when he denies me the belief in a religion which belief I seriously assert I do possess: when he talks of a man whom he has never known as "having nothing of science but its parade,"—I say he ought to be able to prove the above assertions by arguments and facts. He charges me with want of "temper" I do not deny it—but ere this saintly slanderer reproaches me again let him remember—"how wilt thou say to thy brother, let me pull out the mote out of thine eye, and behold a beam is in thine own eye?" But Mr. Editor, you yourself are charged in his first paper of having been absent from your post and not inspecting your Journal when my first paper was admitted into it; or else of being remiss in not maintaining the respectability and independence of your profession, of leaving "a refuge for Fools and Knaves," of admitting papers which tend to shake our belief as to the existence of a soul and a God, (see your own note upon this very false deduction which he has the *candour* to make from my paper,) and moreover he accused you of admitting into your Journal the discussion of a subject which by no means suited it, because it savoured of theology—he is a "divine," be it remembered:—and yet, Mr. Editor, after all these weighty charges, you had the illiberality and stupidity to admit a second of my papers, supporting the same opinions. Indeed, sir, it would be no trifle, did he possess such Herculean strength, as he says, "resembles ocean into tempest wrought!"—in science, divinity, and grace; but to this I reply, "Doff that lion's hide, go hang a calf-skin on those recreant limbs." He says I am open to his lash—I pray him use it. But before I conclude I will give him one piece of advice, that when next he borrows the title of a priest, let him not forget to sustain the character better; when he again calls himself by the respectable title of the sacred calling, let him remember the precepts of its Divine Master; and should he again enter into a discussion, the nature of which he is entirely ignorant, let him not substitute for a confession of ignorance, the lowest ribaldry, and the most unchristian reviling.

With regard to his misquotation and perversion of that passage relating to Bichat and Lawrence, and his confession of his ignorance of physiology, I have only to say they require no comment.

I shall now proceed to Mr. Thomas's paper; a paper which evinces considerable talent, combined with a quality highly necessary in fair and unalloyed argument —*toleration*.

However I may dissent from Mr. Thomas, it is with feelings of the greatest respect for those high mental endowments with which he is known to be possessed. What an agreeable contrast does this opponent's production present to the jejune, abusive drivel of the divine. Mr. Thomas says that the *vital principle exists only in the brain*. Now all structures possess *vital qualities*, and by them vitality is more or less developed, and in consequence of structures possessing the *vital principle*, every structure is alive because it possesses

this principle, and cannot, either as an abstract part, or as an integral portion of the whole system, be alive, without it: the body lives for a certain length of time after decapitation—the circulation goes on, and a muscle lives after being cut out of the body—which is known by its contracting on being stimulated. This could not be if the whole of the body or the exterpated part received the living influence or effects of the living principle from the brain only; for as soon as the influence of the brain is taken away, its effects should cease, and the part should immediately lose all organic action. The blood, as that great oracle Hunter tells us, is alive, i. e. has in itself the living principle, like all other living substances; or else it would act as an inert and foreign fluid; in order that it should produce its just effects upon the parts and vessels which it acts upon, and which act upon it in return, there must be betwixt the parts and the blood, I think, an *affinity of life*: the blood is the product of living substance, and it is the source of all living structure: in fact the Bible most distinctly says, in wonderful coincidence with the doctrines of Hunter, "that the life of the flesh is in the blood." Now this cannot be misunderstood in consequence of any obscurity of phrase, the right understanding its meaning does not rest upon the ambiguity of any single word, I take the meaning of a whole passage, the reason for such a divine injunction being given is here most carefully and explicitly laid down, viz. because it is the life of the body, and probably the reason is so explicitly given because the injunction was implicated with the duty of man.

What Hunter did for the blood, I believe Majendie, Bell and others have done, and are doing, for the nerves.—Although the blood possesses vitality in a direct and primary manner, yet all living structures possess vitality, nerves and brain of course included, by virtue of their being organically filled with blood; and by reciprocity of action, the blood acting upon the structures, and the structures upon the blood, living effects or qualities, I think, are developed in the substance of these structures, which effects constitute their peculiar functions.

I think Mr. Thomas mistakes the point, on account of the various parts of the nervous system being endowed with such high living qualities, when he attributes the *whole* of vitality to it, or rather to the brain—the centre-point, without leaving any for the other system of parts in the body. Now I do believe that all parts possess, in themselves, vitality, (blood and all,) and the reciprocity of action I have before mentioned, but that it is the peculiarity of nerves and brain that high and most surprising living powers are developed in them, and by them developed and imparted in a direct way to the substance of parts—for instance the property of muscular fibre to contract: and thus I think that all structures may possess their distinguishing living properties for the most part by virtue of the vitality existing, or developed in, the nerves, and bestowed by the latter to the substance of the parts. But granting that the more essential and immediate seat of development of the vital principle is the nervous system,—I will not allow that the brain is the *only* part of the nervous system in which this principle is proximately or primarily situated, and that the nerves are only the *vehicles* for the dispersion of its *effects*, or the diffusion of its influence through the system. This is Mr. Thomas's doctrine, but I think it is contrary to facts and experiment. If the living actions in the different parts of the body depend upon one cause, (the vital principle, in one seat, the brain,) then the effects of that one cause, in that one seat, should be similar in *all* parts of the body. But if he answers that the effects are modified by the organization existing in these different parts; then I answer, these modifications can only be produced in two ways—in a mere *mechanical* way, by the effect of the tortuosity and the mode of distribution of the vessels on the current of blood, &c., or else it must be produced by the *vital principle* existing *in* that organization—the vitality being the manufacturer—and the organization or secreting vessels being the machine employed by the vitality in each structure for producing certain effects, actions, and secretions. And it must be by this very principle, this *living instinct of organization*, if I may so say, positively existing in different structures, which are thus worked upon by this living principle in different ways.

The fact of all sensations being transferable to the brain, and of all volition proceeding from the brain through the nerves, is quite sufficient to account for the "plentiful distribution of nerves to all the regions, and for all the nerves being ultimately referable to the brain and spinal marrow." The very phenomenon of sensation proves the existence of vitality in other parts than the brain: here is a living action (sensation) commencing where?—in a part *remote* from the brain—*created* in this part, and subsequently transmitted *to* the brain. "In a fracture of the vertebræ with depression," the "fact of all the voluntary motion and sensation ceas-

ing below the injured part,"—or at least of the incapability of the brain transmitting volition to the parts below the injury—and of the nerves in carrying sensation from them to the brain; only proves that there is a separation made to a certain degree between the vital functions of the muscles and nerves below the injury, and the vital functions of the brain above the injury; that this link of living action is intercepted for a time by the depression, but the muscles still possess irritability, i. e. they are still excitable to contract. Now if Mr. Thomas's theory were correct, that the living principle resides only in the brain, and not in the spinal marrow and nerves, this would not be the case; nor would a muscle after being cut out of the body possess such a degree of living excitability as to contract by the application of stimuli. If living effects or functions depended upon the brain only, then the influence, or all the effects and actions of that first cause, (the brain,) shed through the nerves to all the various parts of the body, (i. e. the functions of all parts,) would be precisely similar in all parts—Because the variety of living qualities and actions cannot be altogether depending upon the *mechanical* effect of the variation of the arrangement of the organizing vessels.

That this vital principle is not confined to the nervous system alone, seems to be proved also by the blood possessing this principle; and by coagulable lymph or fibrine, as it is thrown out from the blood, and about to constitute the basis of the structures that are on the eve of being formed, also possessing it.

If this be the case, then another of Mr. Thomas's positions falls to the ground—as *to animal life being the mind;* or else the mind must be existing in every part, blood and all, of every animal. It is my firm belief that the mind is identical with the operations or functions of the vital principle in the brain, but is not identical with its operations in other parts. If this vital principle too, is the soul, or as he says, *forms the essential, the active part of what will hereafter form the immortal soul,* which I believe is his theory, then not only all animals, but every part of every animal must in the material sense, possess a soul, or at least a part of a soul.

He believes that the *vital principle* is to be the quickening part of a new and glorious body after death: and that it must be the soul—or *the essential part of the soul:* for what will the soul be but the quickening principle in a future life? Then, if according to him, the vital principle is only a "constituent" of the soul, the soul as a necessary deduction cannot be as yet completely formed, i. e., we cannot have a perfect soul during the present life. Now, which is the best theory, that the soul *is* made, but in embryo and inactive, (and indeed, I think the fœtus in utero may be some illustration of the state of the soul in this life); or, that the soul is not made, but only *to be* made hereafter, *and attached* to a future some-sort of an existence?

My respected controversialist denies the identity of the vital principle in man and inferior animals; now with the greatest deference for Mr. Thomas's opinions, I think, he cannot shew reasons why he *can* deny the identity. I answer the same cause, whatever he may think to the contrary, which is productive of animal functions in man, must be, I think, the same cause which is productive of the same animal functions (same effects) in brutes: and this as it concerns any part of the body, brain and all: and that these effects or functions are in different degrees of development or states of perfection, depending upon the degree of vitality (the degree of cause of function in the part), also upon the quantum of substance of each part (as for example the brain), relative arrangement of the component parts (fibres, vessels, &c.) in each structure, and the natural or temporary condition of the structure, to tone, nervous susceptibility, healthy or diseased. To support his opinion of the non-identity of the vital principle in man and other animals, he says the "same effects may be derived from causes the same in some respects but dissimilar in others." This is another way of saying that they may be produced from different causes. He brings forwards an example of two watches, one indicating the hours and minutes: the other, in addition to this, the seconds; and that the latter watch has power superior to the former; that the power that moves the hands of both is the same, since they produce the same results, viz., that of telling the hours and minutes; but that they differ in this,—that the latter watch has power superior to the former, and can therefore produce different effects. Now, this is a most excellent illustration of my argument, the mechanical principles which move and regulate the two watches are the same in both: the vital principle which actuates both the brain of man and other animals is the same in both; but the different effects produced, as to the extent, perfection, and rationality of the movements, &c., depend upon the degree of the perfection of the machinery—the arrangement, number, relative size, and form of the wheels of the watches—the arrangement, relative size, and condition of the different parts (the wheels) of the brain.

Lastly, Mr. T. says, that the soul is a substantial immortal creature, endowed with the properties of matter: I answer, has it ever been proved that matter is immortal or everlasting; that we shall be endowed with all the properties of matter, and that "we shall hold the same relation with surrounding objects in the world to come, as Adam, our great progenitor did at the creation and before the fall?" I would ask then, shall we eat and drink in heaven? as that would be some consolation to some of our fat Aldermen.

I do not think the stress of any argument should be affected by the significations which can be attached to any single word selected from the Bible. The latitude of the languages into which the Bible has been translated is sufficient to make the true signification of many words, and even some passages, uncertain, more especially such words as relate to the nature of our existence hereafter; language being adapted and subservient to our ideas of matter only, consequently can give us no idea of such things as we were never born to know in this world.

My observations upon Mr. Thomas's theory of the nervous system almost necessarily oblige me to make, for the sake of rendering what I have already said of the brain better understood, some observations on my views of the physiology of the nervous system at large. My opinions on this subject immediately clash with those of Dr. Wilson Philip; a man who claims much admiration for the very laborious manner in which he has prosecuted his experiments; but I cannot help saying, I believe he has made from those experiments wrong deductions, and built those deductions together into somewhat erroneous theories.

I almost regret Mr. Thomas's suggestions on the dependence of the nervous system upon the brain, compel me to do so, as I would rather have preferred coming into the field, on this point, at a later period, so as to have gathered strength by some further observations, and by performing some experiments upon animals, the severity of which, and the length of time requisite, having alone deterred me from so doing previously to this period. In the first place, as to the report made upon M. Gallois' experiments and doctrine, and as to Dr. W. Philip's observations thereon. M. Gallois finds that *a sudden* destruction of the spinal marrow so enfeebles the heart as to destroy the circulation; but that a *gradual* destruction of the spinal marrow does *not* produce that effect; in spite of which he maintains that the action of the heart is *altogether* depending upon the spinal marrow. Dr. W. Philip says, he is very wrong in so doing. I say so too: not that it proves, however, (as Dr. Wilson Philip maintains,) that the action of the heart is altogether *independent* of the nervous system; it only proves that it is not altogether depending upon the influence of the spinal marrow and brain; that it may be depending upon the influence of some other part of the nervous system, viz., the sympathetici maximi, which supply it, and in a less degree upon the Par Vaga. The effects of injuring the spinal marrow upon the heart, prove at the same time, that there is a sympathy established between the heart and other parts which are supplied by the sympathetic, and the brain and spinal marrow, and parts supplied by them, by means of the communications or connecting filaments which exist between the ganglia of the sympathetic and the cerebral and spinal nerves; hence a sudden destruction of the spinal marrow produces the same effects upon the system of this sympathetic, and the actions of the vital organs which it supplies, as any other great injury or sudden and very strong impression upon the nervous system produces, viz., a sudden suspension of the vital functions—or death: for although "the vital viscera derive their power from some other source than the spinal marrow and brain, yet, they are influenced by agents acting on the spinal marrow." But not in the sense Dr. W. Philip affirms; for the source of action, I say, is not the mere irritability or *vis incita* of the heart, but an excitability derived from the sympathetic maximus, whereby the heart is made sensible to the stimulus of impressions, and more especially to the stimulus of the blood in the manner of the blood vessels; deriving its contractility from the same source as all other muscles, viz., nerves. Fœti have been born without brain and spinal marrow—what would there be in these instances to supply nervous power but the sympatheticus maximus? This goes some way to prove the great Scarpa's opinion "that the nervous influence, such as it exists in all the nerves, is of itself sufficient for the exercise of the different fuctions, and that it only wants the stimulus which excites it to action. That the stimulus of the muscles of voluntary motion comes from the brain, and that in ordinary states the blood is the stimulant to the heart: but that in vivid emotions the brain also becomes a stimulant to this organ." I was glad to find these sentiments of so great a man, so nearly agreeing with the conceptions I had formed respecting the physiology of the nervous system.

It is by the ganglionic connexions of the

sympathetic, and *by the heart being partially supplied by the par vagum, in a direct way, from the brain*, that "the heart is subject to the passions, yet independent of the influence of the brain." Thus a division of the par vaga, or decapitation, shall not stop the heart's function, although it shall that of the stomach, because the stomach is almost entirely supplied by the par vaga; the lungs are principally supplied by the par vaga (in a much less degree by the sympathetics); this may account for decapitation, or division of the par vaga in the neck, soon suspending respiration; in decapitation also, the division of the cerebral portion of the tract of medullary matter which gives rise to the respiratory nerves, is cut off from the spine with the brain, and we may suppose (more especially as respiratory action is for the most part an involuntary action,) that the spinal or lower portion of the respiratory tract of medullary matter, giving rise to the phrenic nerve, &c. may be considerably enfeebled by decapitation: for the spinal portion of this medullary tract may derive its influence principally and primarily from the brain, or from the cerebral portion of the medullary tract.

Dr. W. Philip, previously to performing his experiments, crushes, or so destroys the brain and spinal marrow, as to make the animal insensible to pain. Now as the heart does not receive its influence from the spinal marrow, but from the sympatheticus maximus, then paralyzing the spinal marrow may not, perhaps, materially alter the effect of the experiments upon the heart and vascular system; but if it were the fact, as M. Le Gallois states, that the heart does receive its influence from the spinal marrow, the destruction of the brain and spinal marrow would of course paralyze the heart, destroying the involuntary movements of that, as it does the movements and sensibility of the voluntary muscles. This effect, the destruction of the spinal marrow does actually produce, when done very suddenly, not because the heart depends upon the spinal marrow for influence, but on account of the sudden and very great depression of the powers of the nervous system generally, therefore I think Dr. W. Philip was not right, in rendering the animals insensible previously to putting them to the test of his experiments—more especially as such a humane resort may stop even the action of the heart, which we know retains its contractile power longer than most, if not all, other muscles.

Dr. W. P.'s experiments from 1 to 12, prove that the action of the heart and blood vessels can be supported without the brain and spinal marrow; *this* of course proves, *as he says*, that Gallois' opinion is untrue, "that the heart and blood vessels are depending upon the spinal marrow;" but it does not prove, what Dr. W. Philip seems to think it does, viz. that they are not depending upon *any* part of the nervous system. The issue of these experiments goes some way to prove that the heart and blood vessels *may* be depending upon *another* part of the nervous system, viz. the ganglia of the sympatheticus maximus: as the brain possesses consciousness, the power of volition, &c. so the sympatheticus maximus has, I believe, inherent in itself, the power of bestowing involuntary action, or giving that sensibility to the muscular parts which it supplies, as to render them sensible to the stimuli peculiar to themselves.

Dr. W. P.'s experiments, from 12 to 23, prove that stimulants applied to the brain and spinal marrow, excite or increase the action of the heart and arteries; this may be compared to the effects of the stimulus of the passions of the brain on the heart and vascular system: and this is by means of the communications which exist between the sympatheticus maximus and the cerebral nerves, and more especially the *direct communication* between the brain and heart through the medium of the par vaga; and we must not lose sight of the effect of the stimuli applied to the spinal marrow, upon the heart, by means of the filamentous communications which exist between the sympatheticus maximus and the spinal marrow, or at least the commencements of all its nerves. The injury done to the brain, for the purpose of destroying the sensibility, must have diminished the effects of the stimulants upon the brain, and consequently their effects upon the heart, "for if either the brain or spinal marrow be instantly crushed, the heart immediately feels it,"—"for only a few quick and weak contractions are the result." M. Le Gallois says he proves, and Dr. W. P. asserts, that "a principal function of the spinal marrow is to excite the muscles of voluntary motion, and that it can perform this office independently of the brain; it performs it after the brain is wholly removed, and yet we constantly see injuries of the brain impairing the functions of the spinal marrow;" they cannot reconcile this "apparent inconsistency." To this I reply, the reason is, that we do not by decapitation take away the power of contraction in muscles; but we take away the faculty which is the cause or natural stimulus which excites that power of contraction, viz. the volition of the brain.

Dr. W. P.'s 35th experiment is intended to prove the non-dependence of the voluntary muscles upon the spinal marrow and nerves, in other words, that the *vis nervia* and *vis incita* are two principles. "All the nerves supplying the hind legs of a frog were divided, the skin was removed from the muscles of the leg, and salt sprinkled upon them, which, being renewed from time to time, excited contractions in them for twelve minutes; at the end of this time they were found no farther capable of being excited. The corresponding muscles of the other limb, in which the nerves were entire, and over which consequently the animal had a perfect command, were then laid bare, and the salt applied to them in the same way. In ten minutes they ceased to contract, and the animal had lost the command of them." I think this experiment is not conclusive. We know that foreign stimulants kept applied to the body, only produce their effects for a time, their effects gradually diminishing, in a ratio to the length of time they are applied, or as the parts get accustomed to their stimulus, and in a ratio as they exhaust the excitability of the nerves; and also in a ratio as they come to be acted upon by a fresh and more powerful stimulus, the effects of the stronger stimulus preventing the effects of the weaker. This may account for the excitement by the salt ceasing in the limb where the nerves had not been divided, in a less time than in the limb in which they had. The excitability of the nervous system must have been much diminished, by great and continued excitement, previously to the application of the salt to the limb in which the nerves had not been divided; more than this, the muscles and nerves were still subject to the stimulus of the will, so that as the stimulus of the salt upon the muscles diminished, the stimulus of the will (the mind being now in great excitement) prevailed, and nullified completely the effect of the salt.

Upon the strength of the next experiment he says, "We cannot see any difference in the nature of the muscular power of the heart, and that of the muscles of voluntary motion, except their being fitted to obey different stimuli, a difference which, as may be expected, appears from direct experiment to exist in the two sides of the heart itself, the natural stimulus of one being red, of the other black blood." I answer, so far from the two sides of the heart requiring different stimuli, I believe black blood would excite a contraction in either side of the heart, but of course red blood being the strongest stimulant, would produce the strongest contractions in either side; in proof of which the ventricles of the heart can be stimulated to contraction by force of distension with an inert fluid, as by inflation with air or water. Moreover, somewhat in contradiction with the last quotation, he says, in another part of his work, page 98, experiment 44, "all stimulants applied to the brain and spinal marrow never excite an irregular action of the heart, while nothing can be more irregular than the actions they excite in the muscles of voluntary action." "And that the effect on these muscles (of voluntary motion) is *felt chiefly* on their first application; but continues on the heart as long as the stimulant is applied." Therefore I believe it to be another sort of contraction altogether; the two sides of the heart being supplied by the sympathetic; the voluntary muscles by spinal nerves. Now these differences I think can only depend upon difference of sensibilities and functions possessed by the nervous matter supplying these different parts. If it be admitted, in consonance with Dr. W. Philip's opinion, that there is an innate principle in muscles, and that this principle, the *vis incita*, is essentially the *same in all muscles* (being the contractility of the muscles), yet, even then, the nerves must be admitted to be the *medium* by which the stimulus is conveyed to the vis incita, and that different muscles are susceptible of contraction by very different stimuli; and this, I hold, must be in consequence of the different modifications or conditions of this *medium*, the *vis nervia*, this I think cannot be denied, inasmuch as the column supplying volition is even divided into two portions, one supplying the nerves to the extensor and the other to the flexor muscles.

Dr. W. P. says, that in apoplexy, neither the contractility of the voluntary muscles or of the heart is destroyed, but that the latter contracts because it is still supplied with stimulus, whereas the voluntary muscles cease to contract, they are divested of their stimulus—the will. This is rather at variance with the opinions I have hitherto entertained, as I have always considered that the voluntary muscles in this state of body become relaxed, or lose their tone, which is, by their losing at least a certain degree of their contractility; if, however, Dr. W. P. is right, I would add another reason, in addition to that which he has already advanced, why voluntary muscles should not lose their tone; viz. that the heart retains its power because the sympatheticus maximus is yet uninjured, and the voluntary nerves and muscles retain their power because the spinal marrow is as yet uninjured.

Probably much may depend upon the seat of apoplexy in the brain, or of the compressing cause, in affecting the functions of the portion or portions of the brain in which the extravasation occurs. In fact, a compression or destruction of the base or spinal part of the brain, or even the cerebellum, would have a much more material influence in impairing the functions of the spinal marrow, i. e. sensation, volition, and respiration, than a destruction of the higher or intellectual portions of the brain, for, in experiment 36, he found stimuli to affect the brain in this manner—"the instrument only excites voluntary nerves when it approached the base of the brain," i. e. the spinal part, or the source of the nerves and spinal marrow.

I believe that the muscles are affected by peculiar stimuli, and that, as a consequence of the supplying nerves being excitable by those same stimuli.

I do not believe Dr. Philip when he asserts "that the difference between the action of the heart and voluntary muscles depends upon the heart sympathizing with *all* the brain," for I believe that if a stimulus, spirits of wine, or any thing else, could be applied to the whole of the brain, and thereby to bring the sensibility of the heart fully under this stimulus, that irregular action of the heart would not be produced like that which takes place in voluntary muscles, *because the nerves themselves are different*, and convey a different kind of impression. Moreover than that, the heart is both supplied by the sympatheticus, as well as by the par vaga, consequently by stimulating the *whole* of the brain, the par vaga would be the only nerve stimulated, while the sympatheticus maximus would be left comparatively unaffected, and probably adequate to keep up a regular action of the heart. Dr. W. P. asks the important question, "do parts sympathize by their nerves being connected by a continuous tract of medullary matter at their origins in the brain, and also by the substance being continuous at their connections during their distribution?" I answer, a continuity of matter must conduct a continuity of impression, provided the matter of the nerves (thus joined) be homogeneous, if not, the effect produced will, I conceive, be a modified one. He asks, what nervous connections exist between a vital organ and the skin which covers it? I answer, nerves are, in some instances, common to the two structures, or the vessels of the two are occasionally continuous, and these, I believe, convey sensibility, and establish sympathy, by means of the sympathetic nerves which structurally pervade them. He asks what nervous connections exist between the liver and the ligaments of the shoulder? I answer, I am not aware, that in diseased liver the pain is situated in the *ligaments* of the shoulder, I know it is situated in the region of the shoulder, probably in the nerves, and the most vascular and sensible parts; and I know also that the liver receives a branch of the right phrenic nerve. The right phrenic nerve comes off from the cervical nerves, descends on the scalenus anticus, enters the thorax between the subclavian artery and vein, is subsequently continued downwards on the side of the pericardium in front of the root of the lung, to the upper surface of the diaphragm; when it throws backwards this filament which descends through the foramen posticum diaphragmatis to the liver: surely this nervous connection between the liver and the nerves in the shoulder is sufficient to account for the sympathetic pain so frequently attendant on hepatic disease. Besides, the phrenic nerve is a respiratory nerve; the lateral inferior and posterior part of the neck and upper part of the shoulder, is supplied by respiratory nerves, more especially by the nervous spinalis accessorius Wilesii; these nerves will, therefore, sympathize by continuous origins, so as to hold the shoulder and the liver expressly in sympathy. He asks what connections are there between the intestines and the muscles of the abdomen, &c.? I answer, the direct connections between the ganglia of the sympathetic, and the commencements of the incostal *nerves, which supply the abdominal muscles*,—not the lumber nerves, as Dr. P. supposes.

Dr. W. P. inquires, what are the connections between "the viscera of the abdomen, head, and their membranes?" I answer, we have these supplied by arteries, the nervi vasorum of which are from the same source and of the same kind, viz. the sympathetics; independently of the nerves (portions of the sympathetics and other nerves) which extend betwixt these viscera. I believe nerves sympathise by means of their originating at one common source, but *not* entirely by that means.

Secretion, which is an action of the vessels, is depending upon the nervous system, inasmuch as the nerves are indispensable to all action. See Dr. W. P.'s experiments as to the dependance of secretion upon the nerves. Secretion is an action, and as an action, it depends upon the influence of the nervous system. For instance, if the vessels of the stomach do not lose their *circulating* action by the tying of the par vaga and the withdrawal of the power of

the latter, they lose that action which is necessary for the *due secretion* of gastric juice. I believe that this secreting action of the vessels, thus immediately depending upon the nervous influence, not only separates and throws out from the blood the constituents of the secretion, but also unites the constituents together so as to form the secretion.

The drift of Dr. W. P.'s experiments is to establish the identity between the nervous and electric fluids. This I cannot admit, but I will *not* say that electricity is not an instrument under the influence of the nervous principle in facilitating the secretion of the constituents from the blood, and also of uniting them together to form the secretion; but I think it is far from being demonstrated as being indispensable to the production of a secretion. Secretion, instead of being a power or influence which the arteries have upon the blood, derived from electricity, is from beginning to end a vital function, I think it is separation, combination, and assimilation, all combined: the living action of the extremities of these arteries, by virtue of the nervous influence, makes the secretion, the blood being the material to be worked upon; the nervous influence gives to the extremities of the arteries, I think, a power somewhat analogous to the assimilating power of the stomach in the process of chymification.

I now come to the Doctor's 50th and 51st experiments, intended to show that the action of the alimentary canal is independent of the brain and spinal marrow, and therefore of the nervous system; I think this requires no other comment, than that the whole length of the alimentary canal is abundantly and most expressly supplied by the streams of filaments from the sympathetici maximi.

As he says, the effects of the passions on the alimentary canal, leave no doubt that it is stimulatable through the nervous system: I explain this, in the same way as I do the connection of the heart with the spinal marrow and brain, i. e. (the sympatheticus maximus is connected by ganglionic filaments with every part of the spinal marrow and with the brain, and as the alimentary canal is supplied by the sympathetic) the alimentary canal is, by virtue of its supply from the sympathetic, connected with the brain and spinal marrow, spasms of the voluntary muscles in cases of colic, prove the connections of the alimentary canal with the spinal marrow, pathologically. We know that there are very numerous connections between the sympathetics and par vaga in the thorax, and less numerous connections also in the abdomen; these account for digestion having been sometimes imperfectly carried on when the par vaga were divided in the neck, for even then the stomach received some nervous influence from the sympathetics, added to this, the arteries of the stomach are supplied by the sympathetics. The connections above described, will, probably, account for respiration imperfectly going on after the division of the par vaga in the neck; which connections and the action of the larynx and muscles of respiration, are sufficient to support this function in a limited degree.

The Doctor's experiments, from 58 to 62 inclusive, are intended to shew that a destruction of a portion of the spinal marrow produces similar effects upon the lungs and stomach, as does a division of the eighth pair of nerves. My reasons for saying that nothing can be more inconclusive than the Doctor's deductions are—That there is no parity between the effects produced upon the lungs and stomach by a division of the two par vaga and a destruction of a portion of the spinal marrow, and all the effects mentioned can be easily accounted for by the disturbance and irritation which such a destruction of the spinal marrow must necessarily produce in the whole nervous system; more especially, in consequence of the lungs and stomach, partially supplied by the sympathetic, being so immediately connected with the spinal marrow by the communicating filaments of the sympathetic; therefore it would be impossible that such an injury of the spinal marrow should not seriously disturb the functions of the lungs and stomach.

The experiments upon the spinal marrow and those on the eighth pair of nerves, differ in the following essential particulars; (yet, a similarity in which, is absolutely necessary to establish the proof of identity of influence, between the par vaga and the spinal marrow, in their effects upon the lungs and stomach;)—In the experiments upon the spinal marrow, there *is not so much difficulty of breathing* produced, as in those upon the par vaga; *nor do the lungs present the same appearances;* in one or two experiments were "red spots" of some sort in the lungs, but I should think (from his account) that they were of a much lighter colour than the "dark coloured patches" produced by the experiments upon the par vaga, and that they were probably of a different nature; but what is the most important of all, the function of the stomach is *not so much interrupted:* in short, the animals seemed to die from a general disturbance of the nervous system; the sense of

cold which particularly affected them, was, in part, probably owing to the paralysed state of the nerves of common sensation. Besides which, any considerable impression cannot be made on the nervous system (its powers cannot be either excited or depressed) without a similar impression being produced on the vascular system; therefore, by a division of the spinal marrow, the nervous system is considerably disturbed and weakened, and along with that, the actions of the vascular system are depressed, and a less quantity of latent heat is developed from the blood as a necessary consequence, in a ratio as the circulation slackens.

The results in the two sets of experiments last alluded to, are not at all parallel, and the immediate death from a destruction of the whole or a great portion of the spinal marrow, pretty well proves that it must be in consequence of the general impression made upon the nervous system; see also especially experiment 62, the spinal marrow was divided completely, no motion of course in the lower extremities, the rabbit seemed lively, continued to eat frequently—*it had not vomited*, nor, I believe, was vomiting produced in any of these experiments upon the spinal marrow, as in the experiment upon the par vaga,—*no difficulty of breathing*, died twenty-seven hours after the operation. The food contained in the stomach was *well digested*, the contents of the stomach had completely undergone a *proper change*, the lungs *collapsed* on opening the thorax, was only found to contain a little *frothy mucus*. Now, I maintain, that it is an absurdity to assert a similarity between the result of these experiments, and those produced by a division of the par vaga. Indeed, Dr. W. P. apparently saw the disparity, and attempted to explain it by saying, " that the *lower part* of the spinal marrow still performed its office in supplying its portion of nervous power to the stomach and lungs." But this is an assumption wholly unfounded on experience, and not borne out by anatomy. I should rather say, that as the inferior extremities were paralysed, so the stomach deprived of nervous influence from the same source, should have been much more considerably deranged than it was; if it did what it really *does not*, viz. receive a supply from the spinal marrow, through the medium of the sympathetics, below the inferior dorsal rectebræ. The communication between the stomach and spinal marrow, must be through the medium of the splanchnic branches, which almost entirely supply all the abdominal viscera, with the exception of the stomach, and which arises from the seventh, eighth, and ninth, sometimes tenth, and eleventh dorsal ganglia of the sympathetics: therefore, as the operation was performed upon the middle of the spine in this experiment, the injury was probably done to the only part of the spinal marrow whence the lungs and stomach could be supposed to derive nervous influence: in this case, I presume, the functions of the stomach and lungs should have been more considerably interrupted than they were, if they depended for function upon the spinal marrow, as they do upon the par vaga: whereas the stomach and lungs, I maintain, in these experiments only suffered in common with the whole of the system.

If the sympatheticus maximus merely transferred the influence of the spinal and cerebral nerves, or as Dr. W. P. asserts, of all the nerves which " communicate with its ganglia " to those parts which these ganglia supply; then, as the heart is partially, and the alimentary canal entirely supplied by the sympatheticus maximus, the actions of these should be as voluntary as the actions of the voluntary muscles. It appears rational, if not absolutely necessary for the harmony of the system at large, and quite consistent with his experiments, to suppose *that the sympatheticus maximus, by the connections of its ganglia, brings the motions of the heart, alimentary canal, &c., under the influence of every part of the brain and spinal marrow:* but I argue, that the ganglia of the sympathetics do possess a function *peculiar to themselves*, whereby certain qualities are developed in them, by which means *they give a necessary kind of sensibility and involuntary action to the thoracic and abdominal viscera.* I think Dr. W. P. underrates the importance of the sympatheticus maximus, and this, in consequence of neglecting to experiment sufficiently, and particularly upon that part of the nervous system.

We know that the arteries of the stomach are supplied by the sympatheticus maximus (like all other arteries); we know, too, that the kidneys are very abundantly supplied by the sympathetici maximi, in the form of the two renal plexuses; here the sympathetics *must* bestow to the secreting arteries of the kidneys, the function or power of secretion. We know on the other hand, that the arteries of the stomach supplied by the same nerves (the sympathetici maximi) when deprived of the influence of the par vaga, (their principal source of supply) no longer secrete gastric juice, or if they do at all, the secretion is almost entirely suspended: thus it appears that the function of secretion

depends a great deal upon the quantity of nervous influence, or in other words, the number of the nerves.

Dr. W. P. endeavours to account for the action of muscles, or of their being under the control of any certain stimulus, to the mere habit of their being continually subject to the influence of such a stimulus:—that the heart is not subject to the influence of the will only, because it is continually subject to the stimulus of the blood. Now as the heart is constantly subject to the stimulus of the blood, so provided the nervous sensibility of the heart and voluntary muscles are the same, the heart by the constant application of its stimulus (like the voluntary muscles by the constant application of the stimulus of the will, or the uninterrupted continuation of any other stimulus) should become weary, consequently less susceptible, or less to be acted upon by the stimulus in a ratio to the length of time it continues to be applied; for we know that stimuli, by continued application to voluntary muscles lose their effects. If the heart is not specifically subject to the stimulus of the blood, by long habitual attempts we could at least acquire some power over its movements. The muscles of respiration are continually subject to the *stimulus of necessity;* i. e. they are implicated with the lungs, &c., in carrying on involuntary respiration; besides that they are partially under the control of the will, and this double function (if we may believe Mr. Bell) is owing to the nature of the nerves. He (Dr. P.) says, it deserves to be remarked, that the will influences the lower part of the intestines and bladder, the only internal organs which are used in accomplishing *an end desired.* This, like several other opinions of the Doctor, is purely hypothetical, and founded upon an erroneous supposition; for he forgets that the parts of the viscera, which he particularises, are expressly supplied by voluntary nerves in addition to the supply from the sympatheticus maximus, and are the only parts of those and other internal organs, which are supplied by voluntary nerves.

We see in all nature a wonderful adaptation of all her works to one another, as far as they are intended to affect each other, an adaptation of cause and effect; this may be said to constitute the harmony of nature in organic and inorganic matter: now, he says, there are different means of exciting this action, i. e. different causes; and I would ask then, is it not natural to suppose that there is a difference of organic sensibility, in the various sets of nerves, to be adapted to the nature of impressions produced by these different causes or stimuli? Indeed nature seems to exemplify this in the peculiar sensibility of the optic nerves or retina, of the acoustic nerves, &c. He says, that the nerves afford the sole stimulus to the voluntary, and only an occasional stimulus to the involuntary muscles; and this, because he has found that the heart is extraordinarily affected by stimulants through its nerves from the brain. Now I argue, instead of this proving that the heart is not ordinarily, or always affected (by the blood) through its nerves, it makes the probability greater that it is the case. So that it does not by any means prove what he states. Nature, although wonderful, is simple in her contrivances; if the vis nervia forms the intermedium between the will and the contractions in the voluntary muscles, it is rational to suppose that the vis nervia does so between the blood and the contractions of the heart. I will not say whether the impression of the stimulus of the blood is confined altogether to the substance of the heart, or whether the stimulus of the blood is first transmitted through the nerves of the heart to the ganglia whence these nerves arise, and that the involuntary action is subsequently excited in the heart, by a reflected influence sent backwards from these ganglia; but I will say, there is no evidence to suppose that the blood affects the vis incita of the heart, in a direct way without the medium of the sympathetic and par vagum. There are nerves situated in the heart; they spring from ganglia, which must be, certainly, more in their influence than straight continued nerves, or else merely filaments, or a plexus would suffice; and these nerves situated in the heart must have sense, and must therefore be sensible to the impressions and stimulus of the blood.

As to the experiment 64, I believe the sensorial power is only a high modification of the nervous; but as to this experiment proving that this modification, or sensorial power, exists in the spinal marrow, I cannot agree with him. Wounding the limb of a decapitated rabbit, and producing a motion in the opposite limb, is not, I think, by the influence of any sensorial power in the spinal marrow (so far from believing that it possesses any, I don't believe that any is possessed by the spinal part of the brain),—it is only nervous sympathy, consequent to continuity of nervous substance, or by the nervous connections of the nerves in the two limbs, through the medium of the spinal marrow. Again, he says, "a frog will sit in its usual position, and appear sensible to injury inflicted on any part of it, subsequently to decapitation." I should call this *nervous instinct,* distinguishing it

from consciousness; there can be no consciousness left here, for consciousness is gone with the brain; the frog continues to sit because the nerves continue to be excited subsequently to the withdrawal of the exciting cause.

Dr. W. P. thinks there is an identity between the nervous and electric fluids; he says it is not a vital power, not peculiar to nerves as the result of organization, but one that may exist in inorganized bodies. But then he premises that the nervous and electric fluids are the same. Dr. W. P. found that the nerves were sensible to the stimulus of electricity, but then he forgets that they only conduct it in the capacity of wet cords. He endeavours to identify the two in consequence of the fallacy of his supposing that they produce effects somewhat similar; but not identical; for they may at least be produced by other stimuli than electricity. I believe that these effects of electricity do not more resemble the influence of the nervous power, than any other stimulus would do, transmitted equally as suddenly and as strongly through the nerves to the muscular fibre. As to *electricity* being transferred in the form of a continued stream through the two portions of the divided Par Vaga, this is just what would happen if it were transmitted through two portions of a divided wet cord; and, of course, as this is the case (says Dr. W. P.) the *nervous influence* would undoubtedly be transmitted to the stomach, notwithstanding the division of the nerves. Dr. W. P. may as well take a piece of wire, or a portion of wet string, cut either in two, and keeping the cut extremities opposed, but asunder, transmit repeated shocks through the two portions of the divided nerve or the divided cord,—and affirm that he proves, by this means, that the effect of the cord is the effect of the par vagum. I can easily imagine that electricity, when transmitted through the divided par vaga, acting as a stimulus, shall excite the organizing vessels of the lower portions of the par vaga which are continuous with the stomach, so as to excite an increased development of nervous influence in them, which nervous influence, without the application of such a stimulus, would have remained undeveloped, and would never have been brought into action in the stomach previously to the death of the nerve. I say that his experiments prove not that the *electric* fluid is the *nervous*, but that its presence is not incompatable with the organization of the nerve, and that when transmitted quickly through the nerve, it *acts as a strong stimulus*. I contend that electricity proceeds along a nerve just as it would proceed through any inanimate cord, for it proceeds along a dead nerve; it is transmitted through a dead nerve with the same facility that it is transmitted through a living nerve, or a piece of wire, and it is not, therefore, existing in, or transmitted through, the living nerve by virtue of its organization. It is reasonable to suppose, that such a strong and sudden stimulus as an electric shock, thus transmitted through the nerves to their extremities, i. e. to the very seat of contraction, or to the very substance of muscular fibre, shall, through the medium of the substance of the extremities of these nerves, excite a contraction of the muscular fibre (as long as contractibility remains in it) in a very strong manner.

As to heat being a "secretion," I admit that it is an effect produced by the action of the arteries, or an effect of the living functions more especially connected with the circulation; and that a stimulus increasing the activity of these living functions, and quickening the circulation, will produce an increased evolution of heat from the circulation. We know, too, how the activity of the circulation is depending upon the excitability and excitement of the nerves; hence we see electricity is a *stimulant*,—exciting the nerves,—quickening the circulation,—and producing an increased escape of sensible heat from the circulating blood. We know, too, that the blood, as it is extracted from the living body, is alive, and contains a great quantity of latent heat, and electricity or galvanism applied in great quantities, as *mere stimulants*, may possibly have the effect (see Dr. P.'s experiments) of exciting the vitality of the dying blood, and by that means produce a rapid and sensible development of the latent heat which it contains.

But I deem that Dr. W. P.'s experiments have *not* proved heat to be a secretion, because it can be evolved from the blood, and rendered sensible in the structures by other means than *secretion:* for instance, the blood, as it becomes charged with carbon during its circulation, gradually parts with its latent heat in the form of sensible heat, so as to give animal warmth to the different structures; in a ratio as the circulation is quickened, so is this development of heat (passing from a latent into a sensible state) increased also; and this knowledge, as applicable to my views, I shall illustrate in the following manner:—place two bodies together of different temperatures, the surplus heat will pass from the hot body into the *substance* of the cold; for the same reason, the latent heat, as it is circulating in the blood through the canals of the arteries and becoming sensible, may be transmitted in like manner as sensible heat

through the *very substance* of the sides of these arteries to the adjoining parts, because the structure of the arteries is permeable to heat; and this does not oblige us to look to the secreting orifices of the arteries as being necessary for the purpose of throwing out, or *secreting* this heat from the blood; for, as it is the nature of heat to go through the sides of the arteries, it follows that the heat will be developed in that manner, as well as through the secreting orifices (not as an absolute secretion), or will escape from every part of an artery.

We find Dr. W. P. asserting that the peculiar vital powers of the nervous system consist in those by which it controls the agent (his supposed agent, electricity) which it employs. I would ask, where do we see the vital power of the nerves in controlling electricity in any way whatever, when an electric shock is transmitted through living nerves? has the will, by virtue of the living power of those nerves, any control over the electric shock? Or is there any difference between the manner in which an electric shock is transmitted through a living nerve and a dead nerve? I would ask, where are the living powers of the nerves over the electric matter demonstrable? As to the few exceptions, the Torpedo, Gymnotus, and Seluras Electricus; I answer, it is a *peculiarity* in them to have the power of generating and collecting electric matter by a *peculiar* apparatus with which nature provides them. I look upon the peculiar organs of these animals as an electrical machine, regarding the wet nerves only in the light of conductors. Although we may admit of exceptions to general rules, nothing can be more erroneous and unphilosophical to reason from exceptions instead of the rules. I believe that electricity, as it exists in the nerves, may be a salutary organic stimulant.

Besides, Dr. W. P. stating that electricity is merely an inanimate stimulus existing in the nerves to excite contraction of the muscular fibre, he says, that the excitability of the muscular fibre is gradually lessened in a ratio to the length of time the stimulant is applied, on this account the susceptibility of muscular fibre to the stimulus of either the nervous principle or electricity, should be gradually lessened,—and that in a ratio as volition exercises its influence by the agency of electricity upon muscular fibre.—Whereas we know that the very contrary takes place; therefore this (if true) proves that the *stimulus of the vis nervia, upon the excitability of the muscular fibre, is not the same as that of inanimate stimuli;* for a muscle continues to obey the agency of nervous influence, as long as the nervous influence continues unexhausted. I believe that the effect of a stimulus upon a muscle, which is natural to that muscle, continues unabated as long as it continues to be applied, or continues unexhausted; whereas a foreign, or external stimulus, loses its effect upon a muscle in a ratio to the length of time it continues to be applied: and this, I believe, constitutes the great difference between the stimuli of life, and ordinary or external stimuli,—as, perhaps, for instance, electricity.

If Dr. W. P. says that volition is an electrical impulse sent through the nerves of volition from the brain to the voluntary muscular fibre, then the brain must be a receptacle for electricity, and it would be somewhat *shocking* to suppose that our brains were electrical batteries, or galvanic troughs; we should then, indeed, convey about with us Jove's thunderbolts, discharging at pleasure, like the torpedo, our streams of liquid fire.

I would ask Dr. Wilson Philip—1st. Does he believe that the vis incita exists alike in all classes of muscles without any modification?

2ndly.—Does the Doctor believe that electricity is the sole active agent in all nerves?

3rdly.—What proofs has Dr. W. P. that the vis nervia is not stimulated by the blood, and that it does not excite the vis incita of the heart, &c.? If he has no proof as to the latter, I am justified in believing that the vis nervia is implicated with the vital actions as much as it is with the contractions of the voluntary muscles; if so, I think this proves that the *principle* of *contraction* is somewhat different in different classes of muscles; or, if not, I think that the *inexhaustibility* of the power of contraction in the involuntary muscles, and the *exhaustibility* of the power of contraction in voluntary muscles, tend to prove that these varieties of contractibility depend upon the different varieties or modifications of *nervous power* in different kinds of nerves. In his tenth inference, he says, "that the brain and spinal marrow act, either of them, directly upon the heart, as well as upon the muscles of voluntary motion, and we see, moreover, that the heart is subject to the influence of the whole of the brain."—Then, I say, if the vis incita is the same in *all* muscles, and if electricity is the natural stimulant in *all* nerves betwixt the brain and the muscles, then the will (the influence of the brain) should affect both the voluntary and the involuntary muscles, through the medium of the nerves, in the same manner,—should produce volition in both. The 43rd inference, if true, viz.,

"that division of the spinal marrow does not destroy any of the functions of either half of it; the paralysis of the lower part of the body occasioned by its division, arising from that part having its communication with the principal source of sensorial power destroved," seems to go some way in disproving Mr. Thomas's doctrine.

If the ganglia of the sympatheticus maximus have not a particular function, or do not bestow some certain influence to the heart, &c., then, when (as Dr. P. says,) the brain and spinal marrow act through the nervous power (no matter whether directly, or indirectly through the medium of the ganglia) upon the involuntary muscles, *volition* should be produced in the involuntary muscles, inasmuch as Dr. P. says, that the heart is subject to the whole of the brain, whereas any individual nerve is only subject to some small portion of the brain and spinal marrow; consequently, the full effects of volition and the faculties of the mind should be exercised upon the involuntary muscles, and that with considerably more strength than on the voluntary, if the *principle of contraction* is the same in each; *in fact nothing but the effects of volition can be produced by volition: or if the ganglia do not bestow specific power, the heart being subject to the whole of the brain, must receive the impulse of volition from it.*

As to the heart and vessels acting in the fœtal state, when neither brain or spinal marrow exist, (the sympathetic is the part of the nervous system first formed) we cannot suppose that because these parts are not developed, that there cannot be the rudiments of the nervous system (at least of the sympathetic) as yet generated, or about to be generated; that these vessels and the heart do not contain in a ratio to their necessity for action, the essence by which they are endowed with sensibility, such as is adapted to render them sensible to the impulse of the blood, and to capacitate them for supporting the circulation.

In addition to what I have said already, the theories of Mr. C. Bell seem to prove that Dr. W. P. is not altogether correct in stating that the heart is independent of the will, only because it is constantly exposed to the renewed action of the stimulus of the blood, and that a muscle is either voluntary or involuntary from mere habit; on the contrary, it appears well pointed out by nature in the mode of origin, of distribution, and intermixing of the different nerves, that there are different classes of nerves conveying in their substance different functions to different classes of muscles and parts which they supply.

By way of finale, I will just give a very cursory view of my notions respecting the functions of the nervous system, which are in fact, most of those of Mr. Bell's amalgamated with some of my own.—That the brain is a cluster of animal senses and actions; that the brain for the most part dispenses (by its nerves) the power of volition, sensation, and respiratory motion: that the spinal marrow, as a prolongation of the base of the brain, possesses volition, and common sensation, as well as in a less degree respiratory motion: that the spinal marrow consequently gives off compound nerves which possess both the functions of volition and common sensation, and some also in a partial manner the function of respiration, as well as some others which only possess respiratory function: that some pairs of the nerves arising from the base of brain, are nerves, arising from some peculiar medullary masses, which medullary massesare also united by continuity of medullary substance with that part of the brain which is functionally the seat of perception, and these nerves, thus arising, are nerves of peculiar senses; that other pairs of cerebral nerves convey volition; others respiratory motion; and one pair, the nervi trigemini, being compound nerves, convey both sensation and volition: that all the nervous fasciculi of the brain and spinal marrow which convey voluntary motion arise from one continuous tract of medullary matter: that all the nervous fasciculi which convey common sensation arise from another continuous tract of medullary matter: that all the nerves that convey respiratory motion arise from another continuous tract of medullary matter: and that all these tracts of medullary matter (as well as the masses whence nerves of peculiar senses arise) must be continuous in substance with the seat of perception, in order to establish a continuity of organic impressions or actions. But what I more especially bear upon is, as to the sympatheticus maximus, viz., that it gives off its own powers to the parts which it supplies, thus making nearly the whole of the interior of the body its own, and for the most part independent of the will; and also, (by its numerous connections with the brain and spinal marrow and all the nerves,) holding the parts which it imparts involuntary actions to, in constitutional nervous sympathy—with the nervous substance of the brain—with the nervous substance of the spinal marrow—and with all the parts, endued with action and common sensation, supplied by the cerebral and spinal nerves.

There is a want of order and arrangement in these rather extended observa-

tions; they have not assumed the regularity and precision of the experiments and remarks of the distinguished philosopher from whom I have presumed to differ. They were written in the most desultory manner in the intervals between laborious occupation and the most limited relaxation.

(Reply to Mr. Forster.)

Lastly, in reply to Mr. Forster, I will not admit that the organic functions of the brain, the mind, are to be looked upon in the light of the *motion of inert matter*: perception I consider an animal sense; thought I consider an animal action; volition I consider an animal action, performed by certain portions of the brain; just as the retina organically possesses the peculiar sensibility to light, as other nerves possess common sensations, as others possess that peculiar, organic, living power, which bestows volition to certain muscles, and as others possess that power which bestows involuntary motion to other muscles. We cannot suppose that the sense of sight only depends upon mechanical impressions or motions produced in the medullary particles of the delicate substance of the retina;—it is an *active function* of the nerve: nor can we suppose that the *cerebral functions* are produced by mere mechanical movements taking place in the particles of the medullary substance of the different portions of the brain, or even in the blood circulating through, and keeping up the vitality of the portions. But we see that these portions of the brain do possess these faculties; and it is but consistent to suppose they possess these faculties by the boundless resources and effects of animal life and organization. To say that organization cannot produce such effects, because we cannot exactly comprehend the precise way in which it does, would be as unphilosophical as to deny that water could be converted into ice, because we had never seen it; and it is equally as unphilosophical to say that the parts of the brain unequivocally possessing these mental powers, do not, or cannot, possess these functions by virtue of their organization, because we do not at present comprehend *how* they do so; and to go in quest, or rather positively assert the agency of another principle or cause, which we gratuitously suppose to be immaterial, merely because we cannot comprehend the modus operandi of the organic causes. In fact, it is not right to assert positively that two principles are concerned in producing such effects, merely because we do not comprehend the exact manner in which *one* principle or cause produces the effects.

Mr. F. says, that impressions made through the medium of nerves upon the brain, could only possibly produce *mechanical motion* of the particles in that organ, or else the secretion of some fluid. I reply, this would do well in reasoning upon inert matter: but the actions and laws which govern organic matter constitute a *world of their own*: we cannot make deductions proving the proximate nature of these actions, from our knowledge of the mechanical motions which regulate unorganized matter. In fact, mechanical motion would never create or constitute, in its different degrees, the various senses.

Mr. Forster says, "supposing thought to be the result of some peculiar movement of the brain, how, seeing that matter is incapable of spontaneous motion," (here his ideas run upon inert matter) "is that action of the cerebral mass established, which is necessary to the before mentioned intellectual operation, or, in other words, to the exercise of memory?"

I will not pretend to demonstrate the proximate nature of the organic actions which constitute memory, but an incapacity to do so, on account of the imperfect state of our present knowledge in physiology, does not disprove that it is an organic action; but I can throw a probability into the scale which may add a little weight to the latter theory, by the fact, that by the mere removal of matter, or the removal of a part of the brain, we remove memory. Memory is, I think, to be explained by certain phenomena, which must have occurred frequently to other people as well as to myself, viz. the continuance of effects upon the nervous or sensorial system subsequently to the removal of the exciting causes, for example, upon the medullary substance of the retina: whilst writing some short time ago, it happened that I was opposed to the glare of light from a window, when I accidentally closed my eyes, and saw the bright image of a window in my eye. Now when I closed my eye, I was not conscious, nor did it occur to my mind that I was actually opposite to this window; but by still keeping my eyes closed, and taking further observation, I saw that the image of the panes of glass on one side of the window happened to be narrower than the others, I opened my eyes, and perceived that the window shutter was partially closed over the panes of glass on this side; this proved at once that it was the actual image of the window upon the retina, and that it was the retinæ continuing their organic action which caused me to see the window

with my eyes closed, subsequently to the withdrawal of the cause that first excited such an organic action. Upon closing my eyes, I found that by pressing upon the front of the ball of the eye in different degrees, and increasing and lessening the pressure, that the vision of the window was more or less distinct and brighter; but on the other hand, by pressing my eye very hard, this temporally destroyed the image of the window; I also found that by pressing in different degrees, I changed the apparent colour of the light which was seen in the image of the window, and this depended upon the different degrees of pressure making the retina more or less capable of continuing susceptible to the actions produced, by the past impressions of the different rays of light, which had actually passed through the window. Different degrees of pressure, too, occasioning a brightening or an increasing obscurity of the vision, may depend upon the different degrees of pressure exciting or diminishing the susceptibility of the retina. There are other instances of actions being continued in the retina subsequently to the removal of the cause of these actions; as for instance, turning a lighted stick round, in a circle, swiftly, we do not see the lighted stick in one position, but we see an apparent circle of fire; in consequence of the impression which the light made upon the eye when in one part of the circle, not ceasing its effects till it comes round to the same part of the circle again.

I am charged by Mr. Forster with being a materialist. I answer, I am, as it concerns the mind; and what of that? does it necessarily follow that I deny the existence of a soul, or that I should believe the soul is a material principle? I answer, I am a downright materialist, as it concerns the mind; but not, as it concerns the soul: I am a *physiological*, but not a *theological* materialist.

Thus then my doctrine is quite accordant with the *radix* of phrenology, i. e. that the faculties and propensities of the mind have their seat in certain portions of the brain; but I withhold from the efflorescence of the doctrine, i. e. our capability of identifying the position of the faculties and propensities individually by the minute external form of the skull: the latter instead of depending upon the form of the surface of the brain, depends upon other causes, one of the principal of which is ossification—on the other hand, I acknowledge the correspondence between the general form of the brain and skull.

In conclusion I must observe that I shall be happy if my papers directly or indirectly lead to the completion of my desire, viz., to lay low in the dust that which has been the point of contention between materialists and Divines, and which has been the bane to sever society into these two continually contending factions. Give to the physiologist the materiality of the mind, if he thinks his physiology proves it; still do not condemn him as an *infidel*, or as broaching any thing diametrically opposite to the precepts of the Christian religion,—for this, I really believe, no person can possibly prove to be the case. On the other hand, allow the Divine to enjoy all the blessings which accrue to him both in the material and spiritual world, (not by mere hypocritical cant, either in discussion or in the pulpit, but) by possessing such religion as he conscientiously believes his sacred scriptures to inculcate and afford.

Since writing the foregoing observations I understand that a French physiologist has prosecuted some experiments with a view of proving the presence of electric or magnetic fluid in the nervous system; and this would seem *prima faciei* to corroborate the theory of the identity of the electric and nervous fluids; this however appears to me not to be at all the case. He inserted a needle into the Anterior Crural Nerve, and after some time he states the needle to have acquired a slight magnetic power:—but was the Anterior Crural Nerve insulated in this experiment? If not, inserting the needle into any other part of the substance of the living body would probably produce the same effect; inasmuch as the whole of our body contains electric matter, as the whole is pervaded most minutely by nerves. We know that our bodies are charged with electric fluid; we know that the nerves are wet cords, and that as wet cords, they must be specific conductors of the electric matter contained in the body; therefore inserting the needle into the anterior crural nerve (if insulated) proves nothing as to the identity of the electric and nervous fluids; it only proves that the nerves may conduct electric matter as any other wet cords will do. Besides the very *abstraction* of the electric or magnetic fluid from the nerves proves that it did not exist in those nerves by virtue of their organization, but only as it would have existed in an inert cord: if the electric matter were essentially united with the organization of the nerve, and constituted its living influence, I think there would be a greater affinity between the electric fluid and the organization of the nerve, than between the electric fluid in the nerve and the needle; and which affinity existing between the electric matter and the organization of the nerve, would nullify or counteract the affinity

which exists between electricity and the inert steel,—for I believe all living affinities are more influential in the living body than chemical affinities. That there is this affinity between the vis nervia (whether it be electricity or any other substance) and the organization of the nerve, I think, is proved by the affinity existing between the organic actions of the brain, (as volition, &c.,) the vis nervia, and the vis incita of the muscles. Therefore I argue that electricity exists in the nerves, as it exists in inert cords *in addition to the Vis Nervia* itself, and is probably a stimulus to the Vis Nervia. In fine I only say that if the French philosopher proves that electricity exists in the nerves and in the body at large (which I never doubted) he does not at all prove that it is the nervous principle.

I have the honour to be,

Sir,

Yours very obediently,

G. D. DERMOTT.

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