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EXACT CEREBRAL PATHOLOGY.

BY

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A THESIS FOR ADMISSION INTO THE AMERICAN NEUROLOGI-
CAL ASSOCIATION, READ AT ITS ANNUAL MEETING AT
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MORAL INSANITY: A PLEA FOR A MORE EXACT CEREBRAL PATHOLOGY.*

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I N his "Essay Concerning Human Understanding" the master psychologist of our language, John Locke, has referred to those, who would be thought to deserve Midas' Ears, "who, knowing that rich was a denomination for the possession of riches, should demand whether riches themselves were rich." In this confusion of language our philosopher sees the fertile soil in which has flourished the confusion of ideas, which has so conspicuously marked the metaphysical and theological controversies about the mind and its faculties. He insists upon the distinction between a "power" and an "agent," and would have his readers plainly to understand that it is the *man* who perceives, judges, and wills, and not that there are "so many distinct agents in us, which had their several provinces and authorities, and did command, obey, and perform several actions, as so many distinct beings."¹ In other words Locke inculcates the unity and individuality of the mind, and cautions against granting to the faculties each its own autonomy. There is no such agent as a "will," he says, which acts and is free, but it is the "mind" which *wills to act*, and either is, or is not, free. *Powers* are merely the attributes of *substance*, and it is in this sense alone that faculties come from the cerebrum. It has seemed to me

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¹ Bk. 2, Cp. 21, Sect. 6.

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that in this part of his essay, this wise man has not only called the metaphysicians to account, but has clearly indicated a whole catalogue of errors into which many of our medical psychologists have too easily fallen. These errors have thus more than the mere speculative interest which attaches to the thoughts of those who dwell "above and outside of material things," but have a practical application, not only in every hospital, but in almost every court-house in our land. They have crept into our text-books, decided our practice, confused our science, and, unfortunately, sometimes vitiated our testimony.

It is quite possible for us to separate by a mental act phenomena which are quite inseparable in nature. Thus we can discourse about the *color* or *shape* of an object, quite apart from the object itself; but if we desire to alter that shape or color, or to deal with it practically in any way in the arts or sciences, it is very certain that we must leave off talking about the quality and must deal materially with the substance. This power of abstracting *qualities*, and then treating of them as though they were in themselves *substance*, has often been the bane of metaphysics; giving it that fatal immunity from the usual conditions of existence which has permitted it to dissolve itself in the mists of speculation. Nature differentiates by changing the substance of things; men, often by merely disarranging their qualities by an act of mind. Thus in the history of philosophy we see where vast generalizations of the metaphysical imagination have been converted into most potent personifications, so that men have from them attempted to erect even a science of biology, or have fallen down to worship what has no substantive existence whatever. I think we cannot lay claim to be free from this error even in our practical age—because it is a fault which only careful training seems capable of averting—and where we have such brilliant and learned examples of it as we see in the philosophers, who devote themselves to the study of truth, it behooves us, as mental physicians, to see to it that we do not fall into some of these very snares. I do not know in what other sense we can regard the celebrated *ideas* of

Plato, which he proclaimed as real, and the only real, existence; unless we look upon them as conspicuous examples of that particular perversion of thought which converts subjective mental processes into objective realities. I know that there has been a vast deal of speculation about what Plato's exact meaning was in his ideas, and one critic has even said that Plato himself was never quite sure, nor always the same in his definitions, but I know that this eminent philosopher's system has exerted a powerful sway upon the most illustrious minds (not merely because of its dramatic force and its ethics), and continues to absorb men in the fascination of its mystical ideas. They have even proposed to substitute it for Christianity; and one eminent Platonic scholar, Dr. More, is said to have been so imbued with it that he believed he was himself partly idealized, and much improved in his material components thereby—which was shown, among other things, by the fact that his urine exhaled the odor of violets! But the elder Disraeli¹ observes of this, that it was probably not so much due to Platonism as to diabetes!

The Scotch school of psychologists have even attempted to improve on Locke, but have met with so little success that their writings are probably among the last to which the modern school of alienists would look to sustain facts as they are actually found in the physiology and pathology of the "mind." This certainly seems a strange paradox—that those who devote their lives, and often signal abilities, to the study of the functions and qualities of man's highest organism, should find so little to illustrate its derangements and its essential characteristics! This fact has induced me to refer to their system in a paper addressed purely to physicists (among whom they do not count themselves to be), and this the more so because I believe that they exhibit most persistently and designedly these very methods of abstraction and personification to which I have referred. Sir W. Hamilton² defines psychology as the "science of mind," which in turn is the "conscious subject"; thus

¹ "Curiosities of Literature," Art.: "Modern Platonism."

² "Metaphysics," Bowen's edition.

mind is the *substance* (as he distinctly states) and consciousness is the essential *quality*—just as extension is to body. This evidently narrows psychology down to the science of self-consciousness. He makes mind the substance, entirely distinct and apart from brain, which he makes a different entity. Now what he defines as “mind” is only a congregation of the intellectual and moral faculties (in their highest stages of activity), which faculties literally are manifestations of the true substance, which is the brain. This criticism may be materialism—but truth itself is material! “Mind,” as this school uses the word, is an abstraction. We cannot handle, gauge, nor understand it. They themselves are driven to inapt metaphors to explain its relation to the cerebral masses (as the double shield, one side of which was gold, the other silver; or the two clocks which keep time together), or else they calmly confess that this thing which they proclaim as a dogma is unintelligible to themselves! It would seem from Hamilton that all the phenomena of unconsciousness, partial consciousness, and perverted consciousness, and especially those brain (organic) phenomena which underlie consciousness—and are as yet unknown—have no place in his science or in fact. Carpenter, who seems to have been influenced very much by the Scotch school, has made a most fantastic attempt to harmonize “mind” and “matter.” He states that mind is a “force,” and that “forces” can be conceived of as independent of “matter,” upon which they act;—instead of the true statement, that any and all forces whatsoever are manifestations of matter (unless we submit them to this by-play of mental abstraction). He goes on to say: “The actions of our minds, in so far as they are carried on without any interference from our will, may be considered as ‘functions of the cerebrum.’” In the name of natural science what are these “functions of the cerebrum” *when they are interfered with by our will?* Does the cerebrum then cease to act? Does it sleep, or does it collapse, or does it shrivel up? It cannot get out of the skull-cap. It cannot retreat down the *foramen magnum*—like a servant dismissed down the back-stairs.

¹ “Physiology,” p. 543.

Where is the will when it exerts its baneful interference with the cerebrum? What is its exact anatomical and topographical location? How can the "actions" of one thing—"the mind," become the "functions" of another thing—"the cerebrum"? Can the *actions* of one thing ever become the *functions* of another thing?

"What do you read, my lord?
Words, words, words!"

In this convenient shifting of functions to and fro between the "mind" and the "brain," it looks as though the reconcilers were bent upon making the despised brain do all the work, while the exalted "mind" gets all the credit for it. But, unfortunately, this poor brain goes mad, and we have the grave responsibility of studying the truth about it! It might be easy for some to say with Heinroth¹ that "insanity is equivalent to sin." But nowhere else does it appear so plainly as in the Scotch school, that insanity is, in fact, bad metaphysics.

Let us refer, for the moment, to the use by this school of the word *consciousness*. They have made of it, in truth, a term to conjure with, and this, too, by this very process of personification, which I contend is so potent to spoil our investigations of the action of the brain. Sir William Hamilton attempts to erect it into a synonym for all brain action, a something apparently sacred, inscrutable, and, as he says with emphasis, something which cannot be defined; moreover, which never sleeps, which is the identity, and coincident with the soul of man; again, something immaterial, subjective, and in a peculiar sense the "Ego." To prove that it never sleeps, he had himself suddenly awakened from slumber, and claims that he always found his "consciousness" had been at work all the while! Dr. McCosh says² that "self-consciousness" is the one instrument of research in studies of the "mind," and apparently would acknowledge no other. But it appears to me that the "consciousness" of one man becomes *objective* to another

¹ Quoted by Bucknill.

² "Psychology," p. 2.

man, and that it is in these objective studies of "mind" that the alienist proceeds almost entirely in making his examinations of the insane. Reid believes self-consciousness a "separate faculty," by which the mind knows its own operations. McCosh again attaches a mystical sense to the word, and believes that "consciousness" has in some ways a peculiar quality "more of the essence of the soul." The truth seems to be that the etymology of the word supplies the best meaning—that is, "to know thoroughly," and thus applies to all mental acts which lead to knowledge. In fact, *it is* these acts, or only another name for them. It is thus present in different degrees in different acts of the brain, and in some cerebral acts is but dimly, if at all, present, because such cerebral acts are not very active, or are abnormal—as in dreams and in imbecility. The more thoroughly a man knows his present status and its surroundings the more thoroughly is he conscious. If he is absorbed in study he is not as thoroughly conscious as a moment later, when he is suddenly aroused by the inquiry—"What are you doing?" and, recovering himself, answers: "I am studying consciousness." Thus, in its highest activity it embodies distinctly self-knowledge; it is the much-lauded "self-consciousness," the mind-speculum of the philosophers. To put it into materialistic phrase, it is the highest ideation of the cerebrum. The self-consciousness of the insane is certainly a very different factor, both in philosophy and morals, from the "thorough self-knowledge" which, I suppose, Sir William Hamilton endeavored to exert on all occasions, even, as he says himself, when he was asleep. Homer gives a more curious example than Sir William Hamilton. I refer to the death of Rhesus, when stabbed as he slept by Tydides.

"Just then a dreadful dream Minerva sent;
A warlike form appeared before his tent,
Whose visionary steel his bosom tore:
So dreamed the monarch, and awaked no more."

The dream was *true*; the visionary steel was *real*. Was Rhesus conscious or unconscious when he dreamt the exact facts and allowed himself to be slain? ¹

¹ Iliad (Pope), Bk. 10.

Now in all this, as it appears to me, the word as used by the Scotch school is only another evidence of abstracting a *quality* or *mode* and making a distinct *agent* or *being* of it. When they say that they use "consciousness" as an instrument of research in psychology, they can mean in fact nothing more than that the brain, by its faculty of general knowledge, has also the faculty of special self-knowledge; and that it is not using any instrument, but is simply using itself. It is obvious that, by this method of self-inspection alone, we cannot formulate a complete science of the "mind." John Stuart Mill¹ believed in a separate "science of mind" as distinct from a cerebral physiology—but in a very different sense from the Scotch school, and chiefly because of our ignorance of the connection between mental states and changes in the brain substance, and not because those changes are not important, even identical with these mental states. All students of insanity avail themselves of the *phenomena* without being always able to give exact accounts of the *noumenon*, or substance, and its changes. We investigate clinically the expression, language, gestures, and actions of a patient; his habits, antecedents, and heredity, and so construct a diagnosis; but we acknowledge that this is often empirical, and we would much prefer, if we could, to give the morbid anatomy of our patient. This certainly does not prove that the science of gymnastics does not depend upon the anatomy of the body, even if it be not necessary to study Gray in order to exhibit upon the trapeze!

It is probably not too much to say that the most artificial abstractions (as mistaking a part for the whole, or a quality for the substance) and the most dangerous personifications (as erecting a single symptom into a disease, or narrowing a whole diseased organ into one "mental" faculty) have occurred in our courts of law. This is not always more the fault of the lawyers than it is of the physicians; but as it is the lawyers who have had to prepare and formulate the legal tests of insanity—to which the rest of the world, both mad and sane, must conform,—it happens that they have

¹ "System of Logic," eighth edition, vol. ii., p. 430.

especially exposed both their learning and their critical acumen to the study of mankind. The physicians are particularly interested in these tests, as they are the only prescriptions which a doctor is expected to take which are not of his own writing. The tests were somewhat crude, no doubt, in the olden time both for the disease and the irresponsibility which results from it. Fitzherbert defines an idiot as one "who knows not to tell 20 s." Coke tells us¹ that once the king's safety was the test of madness: "In some cases *non compos mentis* may commit high treason, as if he kill, or offer to kill, the king." Thus a man could be mad on every subject but in that particular brain-centre which had regard to the personal comfort of kings. Hale says of this test:² "This is a safe exception, and I shall not question it, because it tends so much to the safety of the king's person," which is a safe conclusion on the part of a chief justice who, having originally taken his seat under Cromwell's government (which had cut off a king's head), was probably desirous to keep his place upon the accession of Charles II. to the throne—even, if necessary, by sentencing every madman in the realm. This method of determining insanity was almost as good as Hamlet's diagnosis of his own madness by the compass:

"I am but mad north-northwest;

When the wind is southerly I know a hawk from a hand-saw."

Hale, again, who was a fertile psychologist, said that lunatics had their lucid intervals "which ordinarily happen between full and change of the moon," during which time they are responsible. He would make the understanding of a child of fourteen years a test for responsibility; whoso had less than this should escape, and whoso had more should be hung—but he does not say who would determine these points of comparative psychology. He it was, apparently, who originated the division into "total" and "partial" insanity—as used to convey the idea that a part of the brain was diseased and a part not, like a half-rotten apple, or a

¹ "Institutes of Laws of England," 3d p., cap. i., p. 6.

² "Pleas of the Crown."

“mildewed ear, blasting his wholesome brother.” Every student of insanity knows that “total” insanity is an impossibility—as it could mean nothing but the total abolition of all brain functions—and that “partial” insanity is a misnomer for *symptoms* and *degrees* of brain-illness, in which respect it would be hardly possible to say that any two cases were alike or exactly on a level. It is but just to Sir Matthew Hale to say that while he contends that some idiots—“*surdus et mutus a nativitate*”—have enough understanding to warrant their trial, still “great caution is to be used” in executing them! I believe it was in Hadfield’s case (he who shot at the king) that the notorious division of the subject into *civil* and *criminal* insanity was made. “If, in the former,” says Shelford,¹ “a man appears upon the evidence to be *non compos mentis*, the law avoids his act, though it cannot be traced or connected with the morbid imagination which constitutes his disease, and which may be extremely partial in its influence upon conduct; but to deliver a man from responsibility for crimes, above all for crimes of great atrocity, this rule does not apply, however well established when property only is concerned, but the relation between the disease and the act should be apparent.” It is not probable that an English lawyer’s veneration for property, and disregard for human life, could be more strikingly displayed. I am fully aware that I am not treating here a novel theme, but it is one so germane to the general drift of the subject that I do not resist the temptation. I desire to make complete these illustrations of man’s futile attempts to artificially construct our science. We who listen to kindred attempts on the part of our own profession can at least derive thus some benefit from the study of law, of which, Blackstone says² he sees no special reason, that it should be pursued by “gentlemen of the faculty of physic.” It is from this very philosophy that have sprung our *nymphomania* (insanity of the clitoris), *kleptomania* (imbecility of the pocket-book), *monomania*, in which not the patient, but *one* of his ideas, is insane, and *moral insanity*, in which nothing is insane about him but his sins.

¹ “Treat. on Law Concerning Lunatics,” p. 42.

² “Commentaries,” Introd., p. 8.

The gentlemen of the law, however, have probably risen to their boldest speculations upon psychiatry in some of the more modern tests which they have proposed. These are especially (1) delusion and (2) knowledge of right and wrong. These tests are so narrow that they cannot cover the subject, and so incomplete that they do not touch it even in the right way. A delusion is not the cause of insanity, but insanity is the cause of the delusion. "Loss of will-power," which some medical authorities insist on, is equally abstracted and artificial. It is nearer the truth to say that the whole mental act of an insane man is wrong (judgment, conscience, memory, and will). In the ideomotor reflex these are but different *modes* of action of the one *substance*. They can be separated in speculation, but neither in physiology nor pathology can they be so dissected, and one part held up as normal and another part as abnormal. To say that a man's intellect is sound, and his will diseased, is a sophism, which has more sound than reason, and is no better than to say that we have his light without the sun himself, or that a Leclanché cell has electro-motive force but no current strength. Thus the word *delusion* is constantly misused; and is really so vague and generalized a term that no one has yet succeeded in giving a definition of it. With some, it is any kind of impaired action of a sick-brain; with others, it is an elaborated and systematized complex idea. The physicians, repelled by the *doctrinaire* tests of the lawyers, have flown to the other extreme. Thus Blandford speaks of "homicidal insanity without delusion." If this means any thing it must be a condition of impaired brain (memory, intellect, emotion, and will) which has not yet originated a systematized, elaborated, symmetrical delusion, such as an erroneous belief, scheme, or suspicion. This impaired brain, if expressing itself in an act of violence, no doubt need not necessarily have elaborated an harmonious, far-reaching design, but acts from ill-contrived, suddenly conceived, or even fragmentary ideas, often of the class of thoughts which we call emotional or passionate. This is the nature of *insane* thoughts, to be both illogical and sporadic—but it would be

advancing to an extraordinary extreme to say that such a brain in such an act had no element of intellect or judgment in it; and it would remove the lunatic not only out of the pale of justice, but out of the realm of nature, to say that he had "impulses" without "motives," if by that is meant that it were possible for him or any man to have even a weak or perverted volition without also some weak or perverted thoughts from which such volition sprang. The will is the intellect in action. The latter may be called *cerebration in esse*, the other *in motu*.

Knowledge of right and wrong, as a test of mental health, indicates this tendency to artificial distinctions or "localizings," as it presupposes a strictly moral insanity, a lesion of the *conscience*, or judgment of moral things. It is an extreme case of "moral insanity." It requires the existence of the most illogical "partial" insanity—an insanity of that part of the judgment alone which has cognizance of things good and evil. To be able to reason correctly upon the abstract subject of right and wrong, is very different from the state of ideation which may exist in regard to one special, concrete act, even the worst imaginable. Into the latter act comes the personal equation—the *man* with his diseased brain. To him it may seem, perhaps,

Dulce et decorum est pro patria mori,

but it may, therefore, appear also proper to shoot at a President. It is indeed a peculiar reflection that the "knowledge of right and wrong" should be put as a test to a poor lunatic, when sane men have been fighting each other for ages to decide the difference between the two, and the first parents were even expelled from Paradise for their too great curiosity on the subject. "My child," said the learned judge to a six-year-old witness, "do you know where you will go when you die if you tell a lie?" "Please, sir," said the witness, "I do not." "Well," observed the Judge, "neither do I."

"Non compos mentis," has long been a term in the law, and is often used to designate something which is conceived

to be quite distinct from "insanity." This has drawn forth an able criticism by Dr. Forbes Winslow. Senile dementia and the gross forms of brain degeneration, as embolus, hemorrhage, multiple sclerosis, and dementia paralytica, are such cases as would probably come under this class. Here the most patent forms of brain deterioration, those upon which we can literally place our fingers, are put out of consideration as quite too material to be classed with the "insanities." Such men have only a disease of their *bodies*, and not of their "minds," hence they do not suffer opprobrium. For what says Chitty? ¹ "The malicious, untrue written assertion, that the king or any person is affected with insanity, is considered a criminal and indictable act, since it imputes to the party a malady generally inducing mankind to shun his society, though, as no one is of perfectly sound mind but the deity, it is not libellous merely to say that a man is not of sound mind."

I have been led thus far in the discussion of the philosophy and law of this subject, because it is from the former that we have much of the theory, and from the latter much of the practice, of this question. I come now to offer some consideration of the medical, or physical, side of the subject. Whoever has taken the pains to read Rush, will observe, perhaps with surprise, that he distinctly outlines the "moral insanity" of later authors. Prichard was long thought to be the originator in English of this generalization, but it is evident that he must yield the distinction to the American physician. The doctrine has had the most brilliant support, and it is only necessary to mention with Rush and Prichard the names of Ray, Winslow, and Maudsley. This question therefore has vitality (and so needs no excuse for its discussion) because (1) it has the approval of such eminent names, and (2) because it is constantly relied upon to acquit a certain class of lunatics in our courts, and almost invariably proves to be a "broken reed," which will not support him who leans upon it. I have always been reminded, when reading the authors mentioned, of Locke's criticism of those who maintained the doctrine of *innate*

¹ "Med. Jurisp.," vol. i., p. 353.

ideas, i. e., that they do not tell us what these particular ideas are which they thus claim to be innate. So with those who uphold the doctrine of a "moral insanity," they do not give us the cases which prove this disease; because it is evident upon close inspection of their illustrative cases that they all exhibit various proofs of intellectual disorder, such as expansive ideas, imperative conceptions, suspicions, and a general course of depraved, or excited, or morose conduct which it is impossible to conceive of as existing without derangement of the intellect. These cases, moreover, range at large through all the classifications now in vogue, and include, promiscuously, cases of imbecility, hysteria, katononia, melancholia, mild mania, paranoia, and even some specimens of delusional insanity. When their "moral idiots" commit suicide or homicide they say that it was done "without motive," to which the criticism applies that (1) it is difficult to penetrate into the minds of such patients; (2) that motive is shown frequently by a strict analysis of former and subsequent language and actions; (3) that no such analysis has evidently been attempted in many of these reported cases; and (4) that it is nearer the truth, and therefore a better plea, to show an insane mind with insane motives, than a "moral" lunatic without any motives whatever.

The doctrine of "moral insanity" proceeds upon an abstraction just such as Locke warns his readers to avoid. It teaches that there is a moral "faculty" in the sense of a distinct agent, which has its own powers and its own diseases, and which may remain undeveloped in a "mind" otherwise healthy, and may become diseased without at all affecting the health of the other "faculties." Yet so artificial is this abstraction, that there seems to have been as much difficulty with the philosophers to give this "faculty" a correct place in classification as if it had been the 4th quality of space. Dr. McCosh¹ cannot put it in either the "cognitive" or the "motive" powers, but gives it an intermediate place between the two. But Meynert,² with great precision, says: "It is taking altogether too simple a view of things to regard morality as one of man's talents,

¹ *Op. cit.*, p. 15.

² "Psychiatry," trans. by Sachs, Preface.

and as a definite psychical property which is present in some persons and lacking in others." He quotes Weissman: "Talents do not depend upon the possession of any special portion of the brain; there is nothing simple about them, but they are combinations of many and widely different faculties." That is to say, that talents or powers (moral, intellectual, emotional, volitional, mnemonic) are complex processes and obscure modes of *one substance*—the brain. The conscience, which, by a scholastic definition, becomes a distinct "faculty" in some systems of philosophy, is in reality nothing but a judgment of things good and evil, and has no more claim to its present distinction than has taste as a judgment of things beautiful. It does not refute this to say that conscience is more than judgment because it is emotional, for such a criticism goes to prove the unity of "mind." All ideation has its distinct modes, and may pass from one to another with great rapidity. An idea which at one time may seem to be of the judgment, does not essentially change its nature, or become another thing, by putting on an emotional phase in another moment. Some have contended that there is no act of "mind" which is entirely indifferent—*i. e.*, without emotion. Sir Wm. Hamilton says: "Cognition and feeling are always co-existent."¹ Even if there be such indifferent cerebration, it is certain that a very slight cause may put it in an emotional mode. Emotion, as originally signifying a *moving* of any idea or mental state, is but a *mode* of ideation, not a distinct department, faculty, localization, or division of man's cerebrum. Some ideas are not apt to be thus moved, being almost or entirely disassociated from pleasure or pain, while others are almost of necessity constantly in this state, because they have to do entirely with things good or bad. But a *moral* perception, again, has sometimes but little of the emotional mode, the brain being rather then contemplative. And on the other hand, emotional states of the brain are not always of things good and evil in the sense of *morals*. It is impossible for me to conceive of an emotional state of the cerebrum which does not include as essential the

¹ See Laycock: "Mind and Brain," vol. i., 171, 172.

state also known as the intellect. This confusion of speech is no doubt helped on by the personification of the word "idea." Mental acts are abstracted into distinct entities or ideas, and these again are labelled and classified like butterflies in a museum; some are "emotional," and some are "sensational," and some are "cognitive." Some become sick, and others flourish like bacteria in beer. They fall together into amazing and entrancing shapes, like bits of glass in a kaleidoscope, or they are tumbled into inextricable confusion, like the blocks of a toy-house. They are dis severed from the brain, and even the "mind" is set to looking at them as something apart from itself. Instead of the *brain* which knows *objects*, it is the "mind" which is cognizant only of "ideas." It reminds me of an insane man who was once confined in an asylum near Philadelphia, who had separated his *identity* from himself, and then accused somebody of having stolen it, and spent a whole day searching over the town for the thief. It cannot be wondered that, with such speculations, exhausted philosophy falls into utter skepticism, or rushes into the shelter of some materialistic theology. It is not to the credit of psychiatry—which is the science of a diseased cerebrum—that any such methods should confuse its results. Moral insanity, and its big brood of special manias, is but the creature of bad science; but the unfortunate insane, who are stigmatized by the term, and robbed often of sympathy and justice, have only too true an existence.

The modern experimental school of brain physiologists, represented in England especially by Ferrier, have perhaps given us more solid information about the cerebral masses than the great bulk of philosophical speculation on the subject during all the ages. These physiologists have demonstrated, or indicated, the only "localizations" which are likely ever to be demonstrated, because they are probably the only ones which exist. Their studies enforce the distinction between a "localization" and a "mode of action." In other words, they have demonstrated that the brain is a great *sensori-motor* organ, and have succeeded in mapping out pretty accurately the areas in which sensations first

strike upon the brain, and the areas from which motor impulses pass out of it. They thus not only confirm the analogy of the brain to the lower ganglionic centres—from which it is probably an *evolution*—but they furnish a solid basis for the system of Locke, who taught that sensations (impressions from without) were the origin of “ideas” (cerebral activities), which are expressed in action by motor impulses. But the grave question arises—What is there between these sensory areas and motor areas? Where are the centres for judgment, imagination, and emotion? I have already said that these are not capable of localization, that they are essentials of *all* cerebation, they are modes of action, and that such cerebation exists both in the sensory and motor areas. Ferrier implies that every sensory area is both retentive (has memory) and comparing (has judgment). It must therefore also be emotional. It is possible, indeed, that some of these areas are more active in one of these *modes* than the others, but it is not possible that any one area should have the monopoly of any one of them, any more than the lungs should display distinct activities in one part to the exclusion of such activities in another part. Ferrier reduces all ideation or cerebation to two elements—sensory and motor. Every “idea” exists in *all* sensory and motor areas that have ever been concerned with it. Thus, he illustrates an orange, which, in idea, exists in optic, gustatory, olfactory, and certain motor centres (those concerned with dimension). This fact is so strikingly displayed in the phenomena of *aphasia* that it seems to be the key to the whole situation. Such a patient has not lost a “speech centre,” because he understands spoken and sometimes written language. But he has lost the use of the motor area from which language flows out of his brain, and just that much ideation and no more. He forgets this much of his motor power. He no doubt continues to think to himself in language, just as he understands it when it flows from the mouth of his doctor in upon his brain at his healthy auditory area. Ferrier¹ sums up the subject: “Ideas, therefore, except in so far as they are simple revivals of definite and uncomplicated sensory

¹ “Functions of the Brain,” p. 267.

impressions or motor acts, have no circumscribed habitation in the brain, but are the re-excitation of each and every one of the sensory and motor centres which are especially concerned in their acquisition."

The application of these important facts to the study and differentiations of insanity seems to me to be evident. It must tend to do away with the sophisticated and artificial distinctions which are largely our inheritance from the philosophic schools, and to regard insanity as a disease of that unit, the brain. There are important and vital distinctions as to the forms the disease may assume, but they are not to be regarded as the expression of any individual "faculty." That such a new philosophy begins to prevail is not a little to the credit of our alienists and neurologists.

The term "ideation," which has been used in this paper, may be defined as that specific act of the organic cerebrum which is usually known and defined by its different modes—sensation, memory, judgment, emotion, and volition. The minute, histological changes which underlie or constitute this ideation, or cerebration, are as yet unknown, as well as many of their morbid actions which lead to or constitute insanity. In this respect our knowledge of ideation is in neither a better or worse state than it is concerning electricity, heat, gravitation, or life. A poor explanation of these phenomena is worse than none. It does not help us to say, with Luys, that they are "purified vibrations," because how does a *purified* or any other *vibration* explain memory and judgment? Neither does it aid us to talk, with Lewes and Gowers, about "lines of least resistance." What is a line of least resistance in a nerve tract or series of tracts? Why does it resist less, and what does it resist less, than other tracts? Is it a "physiological" line, or is it a "topographical" line? Can the mere *direction* of a force, with or without regard to its *resistance*, explain the mechanism of an idea?

Let us rather rest content in our ignorance for a while, conscious that words in themselves have a strange power to propagate error, and fearful lest the few shells we have already found upon the shores of the ocean of truth should after a while hatch out a barnacle-goose.¹

¹ Max Müller, "Science of Language," second ser., p. 555.

