grace and ease of his address, the impression of great amiability, kindness, and unaffected simplicity; while his cheerful and vivacious disposition and his lively conversational powers rendered him an excellent social companion. His ordinary language was well chosen and elegant, and he always spoke in public with great precision and persuasive gentleness. There was a certain humility of manner, a degree of self-depreciation, in his address as in his writings, which failed not to attract men; it was none the less captivating because it might seem the form in which a considerable dash of self-consciousness declared itself. To few men was personal renunciation more uncongenial, and therefore painful; but few have been more ready to sacrifice, in a benevolent cause, those things which men commonly hold most dear.

Such was the impression made on my mind by one whom events conspired to make closely known to me during the last year of his life. Few men who have done so much for the world's good have done so little which the world can regret or censure. Perhaps no one has done so great a work with so little ostentation, so little self-assertion, so much candid appreciation of the merits of others. His public life has been the gain and honour of mankind; and in the noble work which he accomplished he has raised to himself a world-monument, by which men of all lands, through all ages to come, will be taught to remember, not where he died, but where he lived.

A Plea for the Conjoined Study of Mental Science and Practice. Being the Introductory Lecture to a Course of Medical Psychology. By Thomas Laycock, M.D., &c., &c., Professor of the Practice of Medicine and of Clinical Medicine, and Lecturer on Medical Psychology and Mental Diseases in the University of Edinburgh. (*Delivered at Edinburgh, 3rd May,* 1866.)

In this university the study of medical psychology and mental diseases is wholly voluntary. None of the faculties require candidates for degrees to attend the course I deliver, or examine them in the subjects discussed. Doubtless the faculties of arts, theology, and law, might reasonably object to so great an encroachment upon vested interests and established traditions; but it is different with the faculty of medicine, because moral philosophy has only been added to the curriculum of medical studies since I commenced to deliver this course. I have therefore thought it would be expedient (and suggested it, indeed) to permit students of medicine going up for their degrees to choose between medical psychology and moral philosophy; nevertheless the course is still without even this modified

recognition. Nor do any of the other medical boards of examiners of the United Kingdom require it. The Senate of the University of London has, however, very lately recommended the practical study of mental diseases to candidates for medical degrees; but valuable and important as this step is, yet, inasmuch as it excludes medical psychology, it falls very far short of what must ultimately be required in the interests of society of all students seeking general culture or to enter any of the learned professions. I entertain a deep-rooted conviction that mental science, in the modern and practical sense of the term, will sooner or later be forced on the attention of political economists and statesmen as one of the needs of the time; and I am equally convinced that no such science is possible except by the observation and study of morbid mental states. I therefore propose on this occasion to plead for the general study of medical psychology or mental science developed according to this method in this class-room, and although I may not hope to be successful in my pleading, I trust I shall at least encourage you who engage in the study voluntarily to pursue it ardently, as offering its own full reward for any labour you may bestow upon it.

The first questions to determine are—in what respects does medical psychology differ from psychology proper?—and why may not mental diseases be best studied apart from either? In answering these questions comparisons are unavoidable and may appear odious; I trust, however, a statement of the facts will not be considered as an unfair or ungenerous disparagement of either the one or the other method of study. And I would add that, as to medical psychology, I speak of it exclusively as taught from this chair.

We may define medical psychology as the science of the relations of the body and mind of man; it may therefore be considered the highest division of that great group of sciences which deal with life and its phenomena. As a science, it can only comprehend that which can be observed "*re vel mente.*" Consequently the future state of man is beyond its sphere; so also all researches as to the soul considered apart from the body, and all the speculative systems which deal with phenomena beyond the reach of observation and within the domain of thought exclusively. With none of these can medical psychology have relations further than this—that it offers in its facts and conclusions, as a science, a solid ground for speculation and thought. Herein is a first ground of difference between medical and speculative psychology.

This as to its sphere; but as a distinct science it has its own method and principles. It seeks to know all that can be known as to the relations of the mind and body of man by means appropriate thereto; to arrange its knowledge in the order best fitted for thought, observation, and practice; and to point out its applications. This is a second ground of difference from the current systems. They do

not profess to be founded on observation, but on thought; they have, therefore, no methods of observation and no knowledge of the relations of body and mind to arrange and apply. I fully admit that in the study of mental diseases apart from medical psychology these relations are examined, and I think few, if any, of the current systems of psychology and mental philosophy wholly ignore them. But in no instance within my knowledge are those relations investigated according to a truly scientific method. In the ordinary study of mental diseases we learn generally that they are caused by bodily changes occurring either in the brain itself, or in the nervous system in general, or in the blood, or in various organs which sympathies with the brain, or in several or all of these conjointly; and we understand how necessary it is to remedy these bodily changes if we would effectually relieve or cure the mental disease and defect. The whole of this knowledge is, however, derived from experience, which is often fallacious when not guided by scientific principles even in the simplest business of life, but is peculiarly so in dealing with the highly complex phenomena of mind. Hence the practitioner in mental diseases has too often to grope his way along a dimly lighted road, beset with pitfalls, without the guidance of those principles which medical psychology affords, and with results too well known to need detail.

It may be objected that at least cerebral physiology offers to the physician all that he may require. I very freely admit that mental physiology has advanced greatly of late years; but I am constrained to object that in this department also the methods of inquiry are defective. It is to be remembered that the intelligent observation of mental disease must constitute the chief if not the best foundation of any true system of mental science, yet our most eminent writers and inquirers into mental physiology display little if any practical knowledge of morbid mind and of the scientific deductions therefrom. And, what is more objectionable, they follow the method of the psychologists in separating vital from mental phenomena, as if the two were wholly distinct, and by an easy transition adopt the general principles of psychology thus reached. It would be unjust not to admit that speculative philosophy, through the long lapse of ages and the labours of the highest minds, has attained to valuable truths; but then, since these truths have been attained by reflection on the phenomena of consciousness, wholly apart from those of organization, they are incapable of easy or satisfactory amalgamation with principles deduced from close observation of the infinitely varied phenomena of life. Hence, we find that those of our physiologists who have made the attempt have done little more than darken counsel thereby.

It is still more important to note another point of difference. All true science, to use a theological phrase, is sceptical; it has no be-

liefs. On the contrary, psychology is not only professedly founded on thought, to the exclusion of observation, but it as professedly includes beliefs. It is thus far more closely connected with faith and all that concerns the religious life of man than with science, for science, when restricted to its proper work, never enters upon the domain of faith. In thus dealing with beliefs, speculative psychology is occupied, in fact, with its proper work as the science of belief. Man is just as much a believing as an inquiring animal, and therefore will always need a science of beliefs. In science, theories and hypotheses take the place of beliefs in psychology, and the two are not infrequently commingled in certain natural sciences, as geology; but in truth our theoretical and our religious beliefs differ in this important particular—that the former are diverse, because of differences in the observation and interpretation of phenomena, whereas the latter differ according to our thoughts, and are as diverse as the instincts, habits, and prejudices whence they arise. They have, therefore, no relation to mental science as a science of observation, except as to their own nature and origin. Arising in thought, beliefs involve such problems as the unconditioned, the infinite, and the absolute, regarding which science can make no utterance—at present, at least; when, therefore, the mental physiologist or pathologist seeks for general principles and a sound method in speculative philosophies, he only gets within a circle of vague, conflicting, and uncertain doctrines, which are, upon the whole, as unsolid foundations for mental science and practice as the shifting sands to the builder.

To understand better the difference to the physician and the physiologist between a mental science which, like medical psychology, seeks for principles and general laws according to the method of the other sciences, and strictly confines itself to the finite and possible, and that more widely grasping philosophy which comprehends the infinite and the absolute, let us conceive what would be the fate of any one of the mixed sciences if placed in the same relative position as the proper science of mind. Medical psychology may be considered to be a sort of mental chemistry, in which the multitudinous affinities of vital matter are examined in their relations to the infinite variety of mental states. It has to discover them; to name and classify them when discovered; to invent terms and instruments and methods of research; and, finally, to generalise the law of their relations and sequences. Suppose, then, that the chemist, in his investigations into the chemical affinities of inorganic and organic matter, were to draw upon speculative philosophy for his appropriate names and instruments and methods of research and generalisations, what would happen? At the very outset he would find that it had not incontrovertibly settled for him the most fundamental principle of his science, namely, whether that identical matter which he proposed to examine existed or not. When he looked for

methods he would find none; asking for principles, he would learn that questions wholly foreign to his inquiries seriously occupied the greatest thinkers, and that upon all the chief problems bearing directly upon his own science every successive thinker pronounced the conclusions of his predecessor erroneous, a mere chaos, and involved in incurable discord. The beliefs would be even less available than the opinions for the purposes of research, and would constitute the most formidable obstacles to any research whatever. Let us, by way of illustration, suppose our chemist to adopt one of two courses, namely, either to take for his guidance the opinions and beliefs of some one school of thought or of some great thinker, as a Reid, Hamilton, Hegel, or Mill; or to act independently and inquire for himself as to the truth and capabilities of the discordant opinions and beliefs. In neither case would he be left free to pursue his purely chemical researches. The self-satisfied empiric, who assumes to himself the title of a "practical" man, and who of all men is the most hypothetical and prejudiced, would sneer at his so-called science of chemistry, and denounce all his attempts at a classification of substances and of their relations to each other on the ground that an absolutely correct and scientific classification is impossible from the nature of things, and unnecessary when there was so practical and simple a classification as that of the four elements and the simple qualities of hot, cold, moist, and dry. And having anathematised our venturesome chemist's researches and notions as wholly subversive of the good old systems, would finally dismiss him with the lofty reproof that by his labours he only makes the science a bugbear to the student, a butt for satire and abuse by the lawyer, a subject of suspicion to the public, and that he had better cease them altogether. The suspicions of the public would be further manifested by the "great thinkers," who would be intolerant of any doubts of their time-honoured beliefs in quiddities, essences, forms, ideas, and the like; and our chemist would be promptly charged with idealism or realism or pantheism or materialism or mysticism, or, perhaps, with all, according to the current beliefs and suspicions of the thinkers and the suspicious public. Suppose, for example, that our nascent chemist had noted how the atmosphere ministered to all life, and proposed to analyse it and investigate its relations to vital phenomena. The speculative philosopher would object that to weigh and measure the vital air—the very breath of life—that which, indeed, the soul is and can only be likened to—would be rank materialism. "What! bottle up the illimitable—weigh the imponderable—divide the indivisible? The atmosphere is everywhere—imponderable, indivisible, invisible: let us examine it nowhere!" Absurd as all this may appear in regard to ordinary chemistry, it is no exaggeration of the objections raised against the study of that mental chemistry which must constitute the foundation of any

mental science. The first class of objections have been actually advanced against the study of medical psychology within the last few months by the experienced superintendent of a public asylum in Scotland, and those of the second class are drawn equally from a late reality.*

* I refer above to the following views of my friend Dr. Lauder Lindsay, of Murray's Asylum, near Perth, and which I quote from this Journal of April last, p. 143:—"In truth, *there can be no classification* [of mental diseases] *absolutely correct and scientific*, inasmuch as the phases of abnormal mentalisation are as infinite, as varied and varying, as contradictory or capricious, as the phases of human nature, of normal mentalisations, of emotional exhibition, of the play or display of the passions. Neither normal or abnormal mind has been or can be accurately defined so as to *in*clude all the phenomena of the one and *ex*clude all those of the other. I believe a scientific definition to be impossible. The principles of nomenclature and classification, as applied to such sciences as botany and zoology, are inapplicable, cannot be carried out, at least into the details of species and varieties, without sacrifice of truth; and while this is so all attempts at such classifications are simply mischievous and absurd, leaving the subject more confused than they found it, rendering the science (?) called 'medical psychology' a bugbear to the student, a butt for satire and abuse by the lawyer, a subject of suspicion to the public." I need hardly remark that if such objections had been effectually raised against the cultivation and classifications of botany and zoology when those sciences were still in their infancy, there would have been no such sciences now in existence. A scientific classification is a concise and simple expression of the known facts and generalisations of the science, and is perfect or imperfect just as such knowledge is perfect or imperfect. As knowledge in any science advances, its classifications change, but no classification whatever can be perfect (as Dr. Lindsay demands that of medical psychology shall be before it be allowed at all) until the knowledge be perfect. In the absence of this perfection in the classification of mental diseases, Dr. Lindsay thinks that there is no nosology so practically useful as "the old one of half a century ago," which has only the five simple heads of mania, monomania, melancholia, dementia, and amentia, and which consequently represents at least the extent of that century's knowledge. But what is the nosological position of the case to which Dr. Lindsay has thought it expedient to append his criticisms above quoted, even if we go back half a century? He terms it a case of "temporary insanity" simply because the patient, a female servant, had a temper-delirium for a few hours, in a way with which the police and hospital staffs of our large towns are very familiar. Now, a transitory delirium cannot be classed with any form of insanity under any nosology, without confounding states of mental disorder essentially different as to causes, course, and treatment. It is not surprising, therefore, that Dr. Lindsay proceeded to make arrangements for placing his delirious patient in a hospital for lunatics, and that she happily escaped so serious an infliction by a rapid recovery.

The other class of objections is well illustrated by the opinions expressed in a recent number (October, 1861) of the 'British and Foreign Medico-Chirurgical Review,' in an article on certain medical introductory lectures. The late Mr. Grainger, in his introductory lecture, delivered October, 1860, at St. Thomas's Hospital, expressed his entire assent to an important and fundamental principle of medical psychology, namely, "that even in the subtle operations of the mind no thought arises without exhausting a portion, however minute, of the gray nervine of the brain," and "that there is no pure manifestation of life apart from matter." It is a statement of a fact or two in mental chemistry which the reviewer could fairly question or correct. But he prefers to fling "materialism" at the mental chemist and assert his beliefs. "Materialistic or not," says the critic, "this localising of thought in the cineritious structure of the double brain, this amalgamation of logic and pure mathematics 'by equivalents,' with corresponding infinitesimal atoms of gray matter, always appeared to our limited apprehension as materialism burlesqued or materialism under mystification.

We cannot wonder at the unscientific character of mental physiology and pathology when such objectors succeed in forcing upon mental science their own methods, and insist that narrow prejudices and time-honoured beliefs shall take the place of the simplest facts of experience and the most obvious deductions from research. Like methods and principles would introduce a veritable dry-rot into any body of scientific truths whatever. I do not know a more interesting theme than a history of mental science from this point of view. It would establish conclusively how greatly the science of human nature has been retarded and injured by the blinking owls of prejudice and pride. I do not think, however, that the objectors to progress in mental science are wholly without their uses. If they never contribute anything to the advancement of truth, they at least supply the *vis inertiæ* of scientific movement. When Dr. Henry Stubbe, a contemporary and opponent of Bacon, denounced the whole tribe of experimentalists in science as a "Bacon-faced generation," and prided himself on his own superior practical merits in having "small regard for deep and subtle inquiries into natural philosophy," he probably did more service to the cause of truth by exciting inquiry than if he had become a "Bacon-faced" experimentalist himself. Objectors like him are usually incapable of scientific observation, and only discredit it if they attempt it.

These are some of the considerations, then, which commend a NOVUM ORGANON in mental philosophy to the student of mind—an *organon* which shall deal with all morbid mental states whatever as the experiments of the science, and which shall include within its sphere all the relations of vital phenomena, however arising and however manifested to the feelings, reason, and will of man. What special reasons, then, should induce students in the several faculties to study mental science after this method in such a course as I propose to deliver? Chiefly and primarily, they are most numerous and weighty with the student of medicine, for while it offers to him the same advantages as to general culture attainable by others, it is more directly available to his professional success; nor is it a trifling advantage he possesses over the students of the other faculties that he already has acquired so much knowledge of anatomy, physiology, zoology, and animal chemistry, as is necessary to entering upon it in the course of his curriculum, while they must obtain it out of the ordinary course of their studies. But even with these added difficulties the student in Arts who desires to fit himself either

Thought in the double mind of the double brain! Thought in the pineal gland! Thought in this, that, or other pulpy morsel! Everywhere revealed, let us seek it nowhere. Thought is not a thing of bits and pieces. Thought is a presence, without a place." The writer of this absurd denial of one of the most important groups of facts in mental science is probably materialistic enough himself to believe in ghosts that tweak your nose (safely in the dark) or break your head with a tambourine.—T. L.

as a scholar and a gentleman for the performance of the duties which may devolve upon him on the bench or in the senate, or for the successful pursuit of any of the learned professions, has abundant inducements to labour in the study of mental science. For he will find in it all the solid groundwork of a knowledge of human nature, and all the principles necessary to settle doubts in religion and philosophy in so far as the limited human intellect can settle them at all. And it is certain that when the rudimentary knowledge is solidly acquired and the fundamental truths established in his mind, the further study of the science will prove an inexhaustible source of the purest and healthiest pleasure. Nothing, in fact, in any or all the sciences to which he may specially devote himself will be foreign to mental science thus cultivated, for it is thus found to include all and to be the end of all. And in these fields and pastures of new research he will discover that the truths and realities of the world of mind are infinitely more strange than those figments of the imagination in which speculative philosophy too largely indulges.

I do not know how far the student of theology may be, or think himself to be, free to study a science which, like all natural science whatever, must certainly lead to a remodelling of all creeds; and I shall not venture to express an opinion on that point. But I feel myself quite free to say that mental science will assuredly afford a solid support to all the great doctrines of Christianity, whether they be of faith or morals, whenever the intelligent theologian seeks its aid. I can speak with less scruple as to the student of law. To him mental science will offer the means of determining the true nature of evidence; the origin of beliefs and convictions; the just extent of responsibility—personal, parental, social; the uses and abuses of punishment; and the best means of reformation of individual criminals or classes of criminals. I can conceive no nobler object of ambition for a member of the bar than the sifting of the legal experiences of ages by the light of mental science, and no labour more conducive to the good of society. And even for performing the more purely professional duty of an advocate, nothing would be so advantageous as a practical knowledge of insanity, gained by study of cases of mental disease with the light of medical psychology.

I shall now proceed to state a few of the fundamental principles in our mental science, which every student should master and hold fast as great truths. In every science such anchor-truths are needed; in mental science no advance would be possible without them—nothing but the chaos and incurable discord of speculation. The first is a simple truth of experience; it is, that the soul of a man, whatever meaning may be attached to the term, cannot act apart from and independently of the body. The contrary proposition is very widely held and very deeply rooted; it has filled the mind with

superstitious fears, and peopled night and darkness with phantoms. It is not true, however; no living man has ever given that proof of even one solitary instance of his soul acting apart from his body which a true scientific method requires. It is not necessary to refer to the statements as to the activities of disembodied souls made of late years by "spiritualists," because our science has no concern whatever with those; its business is with the living, and not the dead. The erroneous proposition is founded, in truth, upon what takes place within the organism, and not without; all the evidence consists in phantoms of the imagination, such as dreams, illusions, and hallucinations; these are purely encephalic phenomena which our science undertakes to explain.

A second principle is, that no feeling of pleasure or of pain, no emotion, sentiment, thought, or volition, no state of mind whatever, is experienced by a man without a corresponding change of some kind and somewhere in that portion of the body contained within the skull, and termed the brains or encephalon. This does not imply, however, that with every change in the encephalon there is necessarily a change in the mental state; it simply means that every mental change coincides with an encephalic change. Now, this is not a truth of experience like the preceding, but an induction from long-continued and most painstaking observation, anatomical, physiological, pathological, and zoological. It has been affirmed that it is a fact of experience too; that all men are conscious they think with their brains. This is, I think, an error; for it is clear that a man must first know he has brains, which fact anatomy teaches him; besides, if it were a simple fact of experience, Plato and the ancient philosophical schools would never have erred so widely in their mental physiology as to place the seat of the emotions and feelings in the heart. The fact of experience seems to me, in truth, to be wholly the other way; the mind, in its ultimate relations to matter, takes no note at all of that which we observe externally to us and term matter. Our knowledge of that arises from without, and enters through the senses.

A third principle is, that every change in the encephalon, whether it be cerebro-mental or not, is vital. This is so obvious a deduction from the preceding that it is only necessary to mention it. It is, however, of primary importance to our method, for since we cannot observe these cerebro-mental changes, and only know their results as states of mind, we can only gain a knowledge of them and their relations, by comparing them with changes of a like kind, viz., vital changes in general.

And this bears upon a fourth principle, which renders scientific research into these changes possible, viz., that every vital change includes the evolution, conversion, and transference of force; and, consequently, that every mental state necessarily coincides with and

cannot take place independently of a disturbance of an equilibrium of force or forces somewhere in the brain. The word force is here used in the sense now current amongst physicists who resolve all the forces of nature into motion. This principle, therefore, is a purely scientific induction. It includes all those facts as to the convertibility and conservation of the molecular or atomic forces of matter with which we have been made familiar of late years by the labours of Joule, Mayer, Groves, Helmholz, Tyndall, and others. You will find the whole subject examined in relation to mental states in my 'Text-book,' under the head "Mental Dynamics," in which I extend the doctrine to the teleological laws of created things.*

An obvious corollary of this principle bears upon a question lately raised, namely, whether matter exists; for since the changes in the brain associated with all our mental states are exclusively due to the operations of that kind of force we term *vis nervosa*, or nerve-force, we must comprehend its origin and working before we can determine that and other subtle metaphysical questions. That the *vis nervosa* is correlative with the other forces manifested in nature and in the organism is at least highly probable, but it must certainly be differentiated from electricity, heat, light, magnetism, and chemical affinity, because it is in immediate relation with consciousness. Under any view, however, it is a manifestation of vital forces, and consequently this fourth principle links mental science to physics through biology and the laws of life. For in the brains we have nothing more than living tissue undergoing changes according to the laws of metamorphosis of living tissues; this, and neither more nor less.

The fifth principle is anatomical, viz., that the changes in the brains correlative with each mental state do not occur in the whole of the brain-tissue, but in a special and appropriate portion of it. This is an induction from observation, like principle the second. Although not so generally admitted, it is certainly as true, although to what extent true has not yet been shown. Each special sense for example has its own nerves and nerve-centres, and there are more special senses than five. The nerves of touch are differentiated and supplied with a mechanism suitable to take cognizance of modes of motion, as light, heat, vibration, weight; we may therefore conclude that there is a corresponding differentiation in the encephalon, not only of directly recipient tissues, but also for correlative notions regarding colour, form, space, sound, weight, temperature, and the like. This principle, it must be observed, does not exclude the law of unity of function of the diverse parts, common to all organisms, but includes it.

These five principles or fundamental truths, with their corollaries, constitute the basis of the somatic or corporeal side of our medical

* 'Mind and Brain or the Correlations of Consciousness and Organization,' vol. i, part iii, p. 217.

psychology; and if we wished to stop there we could apply them usefully to observation and practice. It would, however, be adopting a medical psychology with the psychology left out, and would be an error in every way. The incompleteness of the science would render it more difficult to study, more inefficient in practice, and more repulsive to the philosophic mind, which aims at simplicity and completeness. The student who desires to go no further may find all the facts on the somatic or medical side in books on anatomy and physiology, and many valuable hints as to their practical applications. Yet since the science proper deals with all forms of consciousness in man, its business is *quicquid agunt homines*, and it must therefore teach the scientific relations of all kinds of feeling, thought, and will to the encephalon. But this is not possible without another set of principles which shall connect vital with mental sequences. In regard to these I must refer you more especially to my 'Text-book.' They cannot be stated in few words, and they must be reflected upon and turned about on all sides and tested in every way before the student can make them part of his knowledge.

The sixth principle, then, of the science, and the most fundamental on the psychological side, may be thus stated. The changes in the brains or encephalon are, as we have seen, all vital. Now, what general law of vital change correlates the highest law of the human mind? All vital changes, whatever they may be (in common, indeed, with all physical and cosmical changes), are manifested in an orderly sequence, so that certain ends result or are attained. This is seen most strikingly and most generally in the succession of changes as to form and structure which the primordial cells of animals and plants undergo, from their first formation by the integration of two cells having different properties (the sperm-cell and the germ-cell), to the highest development of the organism as a complete animal or plant. It is shown, however, as certainly in the successive changes of the simplest molecule or most lowly cell. These changes are due to the molecular forces of matter, and the law of their sequences and relations is the law of adaptation to ends. Now, reason, which is the highest development of the human mind, consists in a knowledge of the order of events and of the means necessary to attain ends, and the rational will is an energizing to their attainment. In nature adaptation to ends is an ultimate fact; so also in ourselves is the consciousness of that adaptation. These two being correlative, I conclude that the same law of mental change is manifested in our brains as in all other living matter, and, consequently, the sixth principle is, that all our mental states are the reflection in our consciousness, according to appropriate conditions, of the vital laws and forces. Whether all living matter be conscious or not does not concern us to decide, nor can we. If, therefore, we desire to know accurately touching the order of our mental states

in relation to encephalic changes, we must seek for that knowledge in a comparison of the order of the correlative vital states, or the laws of life and activity of all living things, as indicating design.

As this comparison can only be established after an observation of the phenomena to be compared, this principle requires for its application to mental science appropriate methods of observation and comparison, without which it must remain barren. And plainly the first step in the method is a classification of the two sets of phenomena, such that a proper comparison of those which are comparable can be instituted. On the one side there must be psychological arrangement of our mental states, on the other a corresponding biological arrangement of vital activities and actions—not in animals only, but also in plants and those lowly organisms which belong to neither or to both. Zoology and natural history already afford ample means for the latter, and both will be still more fertile so soon as men perceive their uses in building up a true science of mind. The psychological arrangement is a more difficult task, for little aid can be got from psychology proper, because psychologists in general have restricted their inquiries to the higher faculties, and expressly excluded the mere appetites and instincts from consideration. Even phrenology, which has approached the nearest of all psychological systems to a natural arrangement, falls far short of what is required.

I have attempted a classification of the morbid mental states of man in accordance with these views, which you will find in my 'Principles and Methods of Medical Observation and Research.' It is a threefold arrangement. First, there is a psychological nosology of the vesaniæ; secondly, an etiological nosology of insanity from the psychological side; and, thirdly, a biological arrangement of all morbid mental states. The latter is new, and necessarily so comprehensive that it seems much too elaborate to those who do not apprehend the object of constructing it. I commend it, however, to your consideration, the more particularly as it indicates the order and method in and by which I illustrate abnormal states of the appetites, instincts, passions, and intellect, not merely as insanities, but also as eccentricities, imperfections, and defects. No sharp line of demarcation divides health from disease and disorder in ordinary medicine, and so it is in the practice of medicine for the mind.

To show more clearly the kind of method to be followed according to this sixth principle, I will examine the psychology and pathology of one of the most fundamental instincts. Man, in common with all sentient animals, desires to live or continue in existence. It is a fundamental law of his nature, so generally recognised as to require no comment. If we inquire into the laws of life of other organisms we find that means are universally adapted to this end of continued existence. The so-called struggle

for existence, of which we have heard so much of late, is nothing more than the adapted energizing of organisms to obtain the means available to this end, which are heat and light and the things in or by which force is conserved and produced, as air, food, water, clothing. Consequently this fundamental instinct comprises a variety of subordinate instincts and instinctive acts, manifested alike by animals and plants, in and by which light, heat, air, and suitable foods, are obtained, and shelter and clothing provided, either by growth or act. But the organism is liable to destruction by the means of forces not adapted to continued existence, and there is, consequently, an adaptation of means of defence against such injurious agencies. This end is attained as to internal processes by means that have been attributed to a *vis medicatrix* and *vis conservatrix naturæ;* but in cases in which the entire organism is involved and the forces arise externally, then the end is attained by what are termed defensive instincts. If they are directed against the physical forces of nature they are protecting, building, fortifying, clinging (in plants) instincts; if against the forces of other living organisms, then they are war-instincts, and include the growth, formation, and use of weapons, cunning, flight, attack. Varied as all these instincts are, they can all be generalised under the fundamental law of continued existence, and they are all manifestations of the fundamental psychological law of adaptation to ends.

But let us now turn to a pathological illustration. This instinct for continuance in existence, so universal and so wondrously manifested, is sometimes abolished, and both men and lower animals commit suicide. Thousands of civilised men and women destroy themselves annually. Suicide is usually believed to be always and of necessity an insane act, because the law of life is as usually considered to be the natural or sane condition. Yet there are reasons for the conclusion that the desire to die arises as naturally as the desire to live. The continued existence aimed at is not for an indefinite period; there is a law of termination of life, therefore, as well as a law of continuance. Now, according to our principle, this law has its correlative mental state, namely, the desire to die; consequently, under those conditions of the organism which coincide with the termination of existence the desire to die is as natural as the desire to live under other conditions. The difference between the two is moral. A man must not terminate his life when he thinks it desirable, because he is a social animal and owes duties to society. Christian morals are the most complete expression of these social duties, and therefore the Christian religion forbids the gratification of this selfish desire, and only permits a man to sacrifice his life when death is to be preferred to a failure in duty. Natural religion also affirms that *dulce et decorum est pro patria mori*, so that the "happy despatch" is not without a touch of virtue. When,

then, is the desire to die morbid? Clearly, when that state of feeling arises from disease in the sensorium, which, under the natural law, arises from natural causes. In many instances of this kind there is no insanity, in the stricter sense of the term, any more than in a nervous thirst or a desire for air, unless there be hallucinations and delusions. It often arises, like other desires of its class, as an impulse, sudden, transitory, and more or less resistible in proportion to its urgency, or as there is more or less infirmity of the moral will; for it is this which restrains the personal or selfish instincts in a well-developed man. The desire to die, then, correlates the natural law of termination of existence, and thus death is both shorn of its terrors and made very welcome. My lamented friend the late Dr. Conolly experienced this natural and happy termination to his long and useful life. At the moment when his last illness came on he said, "I have only one wish—to die; but God's will be done." And while he spoke cheerfully to those about him he prayed that he might not recover.

This explanation of the instincts and sentiments to be classed under the law of the continuance of life and its termination applies rigorously to the results of all other vital processes and their correlative mental states and acts. In the region of the intellect the intuition of the Ego, the I, the one, is a reflex in our mental nature of that law of unity or unification according to which the molecules of a single microscopic cell are held together and constitute one thing, and a multitude of cells one organism. And so with all the subordinate intuitions; each has a correlative manifestation in the universe outside us. Life itself is spiritual, therefore, and the spiritual element of our nature is but the finite reflex of that universal Mind which "sweetly orders all that is." With theology we have nothing to do; but this fundamental fact, as to the constitution of human nature, belongs to our science.

Here, then, is a field for scientific observation opened out to those who are willing and able to cultivate mental science according to a scientific method; large enough to gratify the most ambitious, real enough for the most practical, and amply capable of fulfilling the end of all true science, namely, the enriching of human life with useful arts and inventions. I do not think the development and applications of mental science, according to the principles and methods I have sketched out, beyond the powers of the persevering and industrious student of any faculty. This is mainly required—that a solid foundation be laid in a knowledge of facts and their relations, and in right habits of study. I shall endeavour so to teach that these shall be acquired; but the student must do his part, and in particular most sedulously avoid at least two errors. On the one hand, he must not allow himself to be diverted from observation into speculation. He will obtain, as he advances, new views of human nature

and of deeply interesting questions of philosophy, and the temptation will be great to speculate on questions beyond the science. I do not say that such speculation is of itself bad, but it should be deferred by the student until he has laid a solid foundation in knowledge of phenomena and right habits of inquiry. On the other hand, he will be tempted to look upon many of the facts and illustrations of mental science as commonplace, absurd, and needlessly minute; and this the more particularly if he be already indoctrinated with the speculations of current philosophies, which do not condescend to common things. But man must condescend to the commonest things if he would acquire a knowledge of the order of nature, and consequently to science nothing is trivial, minute, or common. The fall of an apple illustrates a great truth as surely as the rising of the sun or the appearance of a comet; but it also illustrates many applications of the truth to common life which the other phenomena do not. And so in mental science; the illustrations I shall give you from the common conduct of men and women, from the practice of medicine in general, and from examples of eccentricity and insanity in particular, may appear to you trivial and common, but they will illustrate great principles and indicate practical applications. And in after-life, whether it be your fortune as physicians to have special opportunities of observing and treating morbid mental states, or as members of some other learned profession to be brought in contact with special forms of eccentricity, folly, and crime, you will be able both to apply and advance the science in having already learnt how to observe by the light of fundamental truths all the common things with which you will have to deal.

This, then, is my plea for the conjoined study of mental science and practice according to a scientific method.

On the Chemical Pathology of the Brain. By Adam Addison, L.R.C.P. & S. Edin.; Resident Medical Officer, Montrose Royal Asylum.

The chemistry of the nervous system is a subject to which little attention has been given by British authors, but their place has been creditably supplied by several foreign chemists, conspicuous among whom are Couërbe, Fremy, Von Bibra, Hauff, Walther, and Schlossberger. These writers have effected something as regards the chemical pathology of the brain in persons dying sane, but with the exception of a few isolated analyses whose results are sadly in want of confirmation, by Lassaigne, Couërbe, and L'Héritier, it may be said that absolutely nothing has been done in the case of the insane. In fact, the field is a *terra incognita* of unknown extent. I purpose,