BODY AND MIND:

AN INQUIRY INTO THEIR CONNECTION AND MUTUAL INFLUENCE, SPECIALLY IN REFERENCE TO MENTAL DISORDERS:

AN ENLARGED AND REVISED EDITION.

TO WHICH ARE ADDED

PSYCHOLOGICAL ESSAYS.

BY

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PREFACE TO THE SECOND EDITION.

THE first three Lectures, on Body and Mind, and the last two Essays, in this volume, appeared in the first edition. The Lecture or Address on Conscience and Organization, and the Essays on Hamlet and Swedenborg, are additions. Nearly half the book, therefore, consists of matter which was not contained in the first edition. Under these circumstances, a slight addition has been made to the title-page, in order to indicate, so far as possible, the character of the new matter which has been added.

June 1, 1873.

PREFACE TO THE FIRST EDITION.

THE three lectures forming the first part of this volume were delivered before the Royal College of Physicians of London, to which I had the honor of being appointed Gulstonian Lecturer for this year; the latter part consists of two articles which, having appeared elsewhere, are reprinted here as presenting a completer view of some points that are only touched upon in the lectures; and the general plan of the whole, as thus constituted, may be described as being to bring man, both in his physical and mental relations, as much as possible within the scope of scientific inquiry.

The first lecture is devoted to a general survey of the Physiology of Mind—to an exposition of the physical conditions of mental function in health. In the second lecture are sketched the features of some forms of degeneracy of mind, as exhibited in morbid varieties of the human kind, with the purpose of bringing prominently into notice the operation of physical

causes from generation to generation, and the relationship of mental to other disorders of the nervous system. In the third lecture, which contains a general survey of the pathology of mind, are displayed the relations of morbid states of the body to disordered mental function. I would fain believe the general result to be a well-warranted conclusion that, whatever theories may be held concerning mind and the best method of its study, it is vain to expect, and a folly to attempt, to rear a stable fabric of mental science, without taking faithful account of physiological and pathological inquiries into its phenomena.

In the criticism of the "Limits of Philosophical Inquiry," which follows the lectures, will be found reasons why no attempt has been made to discuss the bearing of the views broached in them on any system of philosophy. Neither materialism nor spiritualism are scientific terms, and one need have no concern with them in a scientific inquiry, which, if it be true to its spirit, is bound to have regard only to what lies within its powers and to the truth of its results. It would seem to be full time that vague and barren disputations concerning materialism and spiritualism should end, and that, instead of continuing such fruitless and unprofitable discussion, men should apply themselves diligently to discover, by direct interrogation of Nature, how much matter can do without spiritual help. Let each investigator pursue the method

of research which most suits the bent of his genius, and here, as in other departments of science, let each system be judged by its fruits, which cannot fail in the end to be the best sponsors and sureties for its truth. But the physiological inquirer into mind may, if he care to do so, justly protest against the easy confidence with which some metaphysical psychologists disdain physiological inquiry, and ignore its results, without ever having been at the pains to make themselves acquainted with what these results are, and with the steps by which they have been reached. Let theory be what it may, there can be no just question of the duty of observing faithfully all the instances which mental phenomena offer for inductive inquiry, and of striving to realize the entirely new aspect which an exact study of the physiology of the nervous system gives to many problems of mental science. One reflection cannot fail to occur forcibly to those who have pursued this study, namely, that it would have been well could the physiological inquirer, after rising step by step from the investigation of life in its lowest forms to that of its highest and most complex manifestations, have entered upon his investigations of mind without being hampered by any philosophical theories concerning it. The very terms of metaphysical psychology have, instead of helping, oppressed and hindered him to an extent which it is impossible to measure: they have been hobgoblins to

frighten him from entering on his path of inquiry, phantoms to lead him astray at every turn after he has entered upon it, deceivers lurking to betray him under the guise of seeming friends tendering help. Let him take all the pains in the world, he cannot express adequately and exactly what he would—neither more nor less—for he must use words which have already meanings of a metaphysical kind attached to them, and which, when used, are therefore for him more or less a misinterpretation. He is thus forced into an apparent encroachment on questions which he does not in the least degree wish to meddle with, and provokes an antagonism without ever designing it; and so one cannot but think it would have been well if he could have had his own words exactly fitting his facts, and free from the vagueness and ambiguity of a former metaphysical use.

The article on the "Theory of Vitality," which appeared in 1863, is now reprinted, with a few, mainly verbal, alterations. The aspect of some of the questions discussed in it has been somewhat changed by the progress of inquiry and thought since that time, but it appears to the Author that, great as discussion has been, there are yet considerations respecting vitality that have not been duly weighed. Whether living matter was formed originally, or is now being formed, from non-living matter, by the operation of physical causes and natural laws, are questions which, notwith-

standing the lively and vigorous handling which they have had, are far from being settled. Exact experiment can alone put an end to this dispute: the one conclusive experiment, indeed, in proof of the origin of living from dead matter, will be to make life. Meanwhile, as the subject is still in the region of discussion, it is permissible to set forth the reflections which the facts seem to warrant, and to endeavor to indicate the direction of scientific development which seems to be foretokened by, or to exist potentially in, the knowledge which we have thus far acquired. This much may be said: that those who oppose the doctrine of so-called spontaneous generation, not on the ground of the absence of conclusive evidence of its occurrence, which they might justly do, but on the ground of what they consider special characteristics of living matter, would do well to look with more insight into the phenomena of non-living Nature, and to consider more deeply what they see, in order to discover whether the characteristic properties of life are quite so special and exclusive as they imagine them to be. Having done that, they might go on to consider whether, even if their premises were granted, any conclusion regarding the mode of origin of life would legitimately follow; whether in fact it would not be entirely gratuitous and unwarrantable to conclude thence the impossibility of the origin of living matter from non-living matter. The etymological im-

port of the words physics and physiology is notably the same; and it may be that, as has been suggested, in the difference of their application lies a hidden irony at the assumption on which the division is grounded.

9, Hanover Square, W.
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BODY AND MIND:

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LECTURE I.

GENTLEMEN: The relations of mind and body in health and in disease I have chosen as the subject of these lectures, not with the hope of doing full justice to so complex and difficult an inquiry, but because it has for some time been my special work, and there was no other subject on which I should have felt myself equally justified in addressing you. No one can be more deeply sensible than I am how little exact our knowledge is of the bodily conditions of mental functions, and how much of that which we think we know is vague, uncertain, and fluctuating. But the time has come when the immediate business which lies before any one who would advance our knowledge of mind unquestionably is a close and searching scrutiny of the bodily conditions of its manifestations in health and disease. It is most necessary now to make use of the results of the study of mind in health to light and guide our researches into its morbid phenomena, and in like manner to bring the instructive instances presented by unsound mind to bear upon the interpretation of its healthy functions. The physiology and the pathology of mind are two branches of one science; and he

who studies the one must, if he would work wisely and well, study the other also. My aim will be to promote the reconciliation between them, and in doing so I shall embrace the occasion, whenever it offers itself, to indicate the principles which should guide our efforts for what must always be the highest object of medical science and art—the production and preservation of a sound mind in a sound body. Actually to accomplish much of this purpose will not lie in my power, but I may bring together fragmentary observations, point out the bearing of them on one another and on received opinions, thus unfold their meaning, and mark broadly the lines which future research must take.

Within the memory of men now living insanity was such a special study, and its treatment such a special art, that it stood quite aloof from general medicine in a mysterious and mischievous isolation; owing little or nothing to the results of progress in other branches of medicine, and contributing nothing to their progress. The reason of this it is not hard to discover. The habit of viewing mind as an intangible entity or incorporeal essence, which science inherited from theology, prevented men from subjecting its phenomena to the same method of investigation as other natural phenomena; its disorders were thought to be an incomprehensible affliction and, in accordance with the theological notion, due to the presence of an evil spirit in the sufferer, or to the enslavement of the soul by sin, or to any thing but their true cause—bodily disease. Consequently, the treatment of the insane was not in the hands of intelligent physicians, who aimed to apply the resources of medicine to the alleviation or cure of bodily illness, but was given up to coarse and ignorant jailers, whose savage cruelties will for all time to come be a great and ugly blot upon the enlightenment of the age which tolerated them.

Matters are happily changed now. On all hands it is admitted that the manifestations of mind take place through the nervous system, and that its derangements are the result

of nervous disease, amenable to the same method of investigation as other nervous diseases. Insanity has accordingly become a strictly medical study, and its treatment a branch of medical practice. Still, it is all too true that, notwithstanding we know much, and are day by day learning more, of the physiology of the nervous system, we are only on the threshold of the study of it as an instrument subserving mental function. We know little more positively than that it has such function; we know nothing whatever of the physics and of the chemistry of thought. The conception of mind as a mysterious entity, different essentially from, and vastly superior to, the body which it inhabits and uses as its earthly tenement, but from which its noblest aspirations are thought to be to get free, still works openly or in a latent way to obstruct the study of its functions by the methods of physical research. Without speculating at all concerning the nature of mind—which, let me distinctly declare at the outset, is a question which science cannot touch, and I do not dream of attempting to touch—I do not shrink from saying that we shall make no progress toward a mental science if we begin by depreciating the body: not by disdaining it, as metaphysicians, religious ascetics, and maniacs have done, but by laboring in an earnest and inquiring spirit to understand it, shall we make any step forward; and when we have fully comprehended its functions, when we know how to estimate fitly this highest, most complex, and wonderful achievement of organized skill, it will be quite time, if there be then the inclination, to look down upon it with contempt.

The truth is, that in inquiries concerning mind, as was once the case in speculations concerning other natural phenomena of forces, it has been the practice to begin where the inquiry should have ended. Just as the laws of physical actions were evoked out of the depths of human consciousness, and the relations of bodies to one another attributed to sympathies and antipathies, attractions and abhorrences, instead

of being acquired by patient observation and careful generalization, so has a fabric of mental philosophy been reared on the doubtful revelations of self-consciousness, in entire disregard of the more tedious and less attractive duty of observation of facts, and induction from them. Surely it is time we put seriously to ourselves the question whether the inductive method, which has proved its worth by its abundant fruitfulness wherever it has been faithfully applied, should not be as rigidly used in the investigation of mind as in the investigation of other natural phenomena. If so, we ought certainly to begin our inquiry with the observation of the simplest instances—with its physiological manifestations in animals, in children, in idiots, in savages, mounting by degrees to the highest and most recondite facts of consciousness, the interpretation or the misinterpretation of which constitutes what has hitherto claimed to be mental philosophy. The inductions which we get by observing the simple may be used with success to disentangle the phenomena of the complex; but the endeavor to apply the complex and obscure to the interpretation of the simple is sure to end in confusion and error. The higher mental faculties are formed by evolution from the more simple and elementary, just as the more special and complex structure proceeds from the more simple and general; and in the one case as in the other we must, if we would truly learn, follow the order of development. Not that it is within my present purpose to trace the plan of development of our mental faculties, but the facts and arguments which I shall bring forward will prove how vain and futile it is to strive to rear a sound fabric of mental science on any other foundation.

To begin the study of mind, then, with the observation of its humblest bodily manifestations is a strictly scientific method. When we come to inquire what these are, it is far from easy to fix the point at which mental function begins. Without doubt most of the actions of man, and many of those of the higher animals, do evince the operation of mind,

but whereabouts in the animal kingdom it first appears, and what part it has in the lower nerve-functions of man, are questions not easily answered. The more closely the matter is looked into, the more clearly it appears that we habitually embrace in our conception of mind different nervous functions, some of which proceed from different nerve-centres, and the more necessary it becomes to analyze these functions, to separate the more simple and elementary, and to discover in the concrete as much as possible of the meaning of the abstraction. Is the brain the exclusive organ of mind? If it be so, to what category of functions shall we refer the reflex acts of the spinal cord, which take place independently of the brain, and which often achieve as definite an end, and seem to display as intelligent an aim, as any conscious act of volition? It needs not to illustrate in detail the nature and extent of reflex action, which is familiar enough, but I may select a striking example in order to serve as a text for the reflections which I wish to bring forward. One simple fact, rightly understood and truly interpreted, will teach as much as a thousand facts of the same kind; but the thousand must have been previously observed in order to understand truly the one; for it is certainly true that, to apprehend the full meaning of common things, it is necessary to study a great many uncommon things. This, however, has been done in this instance by the distinguished physiologists whose labors have fixed on a tolerably firm basis the doctrine of reflex action; we may, therefore, take, as our starting-point, the accepted results of their labors.

It is well known that, if the hind-foot of a frog that has had its head cut off be pinched, it is withdrawn from the irritation. The stimulus to the afferent nerve reaches the gray matter of the spinal cord, and sets free a force which excites to action the corresponding motor nerves of the same side. When the foot is pinched more strongly, the force liberated by the stimulus passes across the cord to the motor nerves of the opposite side, and there is a simultaneous withdrawal

of both limbs; and, if the excitation be stronger still, there is a wider irradiation of the effects of the stimulus in the gray matter, and a movement of all four limbs follows, the frog jumping away. These movements of the decapitated frog, which it is plain effect the definite purpose of getting it out of the way of harm, we believe to be analogous to the violent coughing by which food that has gone the wrong way is expelled from the human larynx, or to the vomiting by which offending matter is ejected from the stomach. Independently of consciousness and of will, an organism plainly has the power—call it intelligent or call it what we will—of feeling and eschewing what is hurtful to it, as well as of feeling and ensuing what is beneficial to it.

But the experiment on the frog may be made more striking and instructive. Touch with acetic acid the thigh of a decapitated frog over the internal condyle, and the animal rubs it off with the dorsal surface of the foot of the same side; cut off the foot, and apply the acid to the same spot, and the animal tries to get at it again with its foot, but, of course, having lost it, cannot. After some fruitless efforts, therefore, it gives up trying in that way, seems restless, as though, says Pflüger, it was seeking some other way; and at last it makes use of the foot of the other leg, and succeeds in rubbing off the acid. Notably we have here not merely contractions of muscles, but combined and harmonized contractions in due sequence for a special purpose. There are actions that have all the appearance of being guided by intelligence and instigated by will in an animal the recognized organ of whose intelligence and will has been removed.

What are we to say in explanation of movements that have such a look of adaptation? Are they mental, or are they only physical? If they are mental, it is plain that we must much enlarge and modify our conception of mind, and of the seat of mind; if physical, it is plain that we must subtract from mind functions that are essential to its full function, and properties that are the very foundations of its development

in the higher centres. Some eminent physiologists now maintain, on the strength of these experiments, that the accepted doctrine of reflex action is quite untenable, and that the spinal cord is really endowed with sensation and volition; and certainly these adapted actions seem to give us all the signs of being felt and willed, except telling us that they are so. Before accepting, however, this explanation of the obscure by something more obscure still, it were well to realize distinctly how dangerous a practice it usually is to apply deductively to the interpretation of simple phenomena ideas pertaining to the more complex, and how essential a principle of the method of induction it is to follow the order of evolution, and to ascend from the interpretation of the simple to that of the complex. The explanation savors of the old and evil tendency which has done so much harm in philosophy, the tendency to explain the facts of Nature by what we feel to go on in our minds; because we know that most of our actions take place consciously and voluntarily, we can hardly help thinking that it must be the same in the frog. Might we not, however, as well suppose and hold that positive attracts negative and repels positive electricity consciously and voluntarily, or that in the double decomposition of chemical salts one acid chooses voluntarily the other base? It is most necessary to be on our guard against the danger of misapplying ideas derived from internal observation of the functions of mind-centres to the interpretation of the functions of lower nerve-centres, and so of misinterpreting them. Assuredly we have sad experience enough to warn us against involving the latter in the metaphysical haze which still hangs over the functions of the supreme centres.

All the conclusion which the facts warrant is that actions for a definite end, having indeed the semblance of predesigning consciousness and will, may be quite unconscious and automatic; that the movements of the decapitated frog, adapted as they are to secure its well-being, are no more evidence of intelligence and will than are the movements of coughing,

sneezing, and swallowing in man. In the constitution of the animal's spinal cord are implanted the faculties of such movements for self-preservation, which it has inherited as a part of its nature, and without which it could hardly live a day; accordingly it acts necessarily and blindly; though it has lost its foot, it endeavors vainly to act as if its foot was still there, and only when the irritation continues unaffected by its futile efforts makes, in answer to it, those further reflex movements which are the physiological sequences of the unsuccessful movements: it supplements one series of reflex actions by another.* But, although these purposive movements are not evidence of intelligence and volition in the spinal cord, it is another question whether they do not evince the same physiological properties and the operation of the same laws of evolution as govern the development of intelligence and will in the higher centres.

I have taken the experiment on the frog to exemplify the proposition that designed actions may be unconscious and automatic, because the phenomena are more simple in it than in man, and more easy therefore to be understood; but the proposition is equally true of his spinal cord. In its case, however, we have to bear in mind that faculties are not innate to the same degree and extent as in the lower animals, but have to be acquired by education—to be organized, in fact, after birth. It must be taught, just as the brain must, before it can perform its functions as an organ of animal life; and, being much more under the control of the more highly-developed brain, feeling and volition commonly mingle largely in its functions, and its independent action cannot be so plainly exhibited. But, when its motor centres have been taught, when they have gained by education the power of executing what are called secondary automatic acts, it is cer-

* Wisely or unwisely, as the case may be; for reflex movements which commonly effect a useful end may, under the changed circumstances of disease, do great mischief, becoming even the occasion of violent suffering and of a most painful death.

tain that it can and does habitually execute them independently of consciousness and of will. They become as purely automatic as are the primitive reflex acts of the frog. To the statement, then, that actions bearing the semblance of design may be unconscious and automatic we have now to add a second and most weighty proposition—namely, that acts consciously designed at first may, by repetition, become unconscious and automatic, the faculties of them being organized in the constitution of the nerve-centres, and they being then performed as reflex effects of an external stimulus. This law, by which the education of the spinal cord takes place, is, as we shall hereafter see, a most important law in the development of the higher nerve-centres.

Let us now go a step further. The automatic acts, whether primary or secondary, in the frog or in the man, which are excited by the suitable external stimulus, may also be excited by an act of will, by an impulse coming downward from the brain. When this happens, it should be clearly apprehended that the immediate agency of the movements is the same; it is in the motor centres of the spinal cord; the will does not and cannot act upon the nerve-fibres of each muscle individually, but simply gives the order which sets in motion the organized machinery of the movements in the proper motor centres. This is a consideration of the utmost importance, for it exhibits how great a part of our voluntary acts is really the automatic action of the spinal cord. The same movements are effected by the same agency in answer to different stimuli—in the one case to an external stimulus, in the other case to an impulse of will; and in both cases the mind is alike ignorant of the immediate agency by which they are done. But while the automatic acts take place independently of will, the will is absolutely dependent on the organized experience in the cord for the accomplishment of its acts; without this it would be impotent to do a voluntary act. When, therefore, we have taken out of a voluntary act the large part which is due to the automatic agency of the motor cen-

tres, it clearly appears that we have subtracted no small proportion from what we are in the habit of comprising vaguely under mind. We perceive, indeed, how indispensable an exact and faithful observation of the functions of the spinal cord is to a true physiological inquiry into mind, and what an important means of analysis a knowledge of them yields us. Carrying the knowledge so gained into our examination of the functions of the higher nerve-centres, we observe how much of them it will serve to interpret. The result is, that we find a great part of the habitual functions of the higher centres to be similarly automatic, and to admit of a similar physiological interpretation.

There can be no doubt that the ganglionic nuclei of the senses—the sensorial nuclei—are connected with motor nuclei; and that we have in such anatomical arrangement the agency of a number of reflex movements. Most of the instinctive acts of animals are of this kind, the faculties being innate in them. In man, however, who is actually the most helpless, though potentially the most powerful, of all living creatures when he comes into the world, the sensory and associated motor nuclei must be educated, just as the spinal centres must. To illustrate this sensori-motor or instinctive action, we may take the results of Flourens's well-known experiment of removing the cerebral hemispheres of a pigeon. What happens? The pigeon seemingly loses at once all intelligence and all power of spontaneous action. It appears as if it were asleep; yet, if thrown into the air, it will fly. If laid on its back, it struggles on to its legs again; the pupil of the eye contracts to light, and, if the light be very bright, the eyes are shut. It will dress its feathers if they are ruffled, and will sometimes follow with a movement of its head the movement of a candle before it; and, when a pistol is fired off, it will open its eyes, stretch its neck, raise its head, and then fall back into its former attitude. It is quite evident from this experiment that general sensibility and special sensations are possible after the removal of the hemispheres; but they

are not then transformed into ideas. The impressions of sense reach and affect the sensory centres, but they are not intellectually *perceived;* and the proper movements are excited, but these are reflex or automatic. There are no ideas, there is no true spontaneity; and the animal would die of hunger before a plateful of food, though it will swallow it when pushed far enough into its mouth to come within the range of the reflex acts of deglutition. Here again, then, we have a surprising variety of adapted actions of which the body is capable without the intervention of intelligence, emotion, and will—without, in fact, mind in its exact sense having any part in them. The pigeon is brought to the level of the invertebrata, which have no higher nerve-centres than sensory ganglia, no centres of intelligence and will, and which execute all their varied and active movements, all their wonderful displays of instinct, through sensory and associated motor nuclei. They seek what is good for them, avoid what is hurtful to them, provide for the propagation of their kind—perform, indeed, all the functions of a very active life without *knowing* that they are doing so, not otherwise than as our pupils contract to light, or as our eyes accommodate themselves to vision at different distances, without consciousness on our part. The highest specializations of this kind of nerve-function are displayed by the ant and the bee; their wonderful instinctive arts show to what a degree of special perfection sensori-motor action may be brought.*

* I do not say that the ant and the bee are entirely destitute of any power of adaptation to new experiences in their lives—that they are, in fact, purely organized machines, acting always with unvarying regularity; it would appear, indeed, from close observation, that these creatures do sometimes discover in their actions traces of a sensibility to strange experiences, and of corresponding adaptation of movements. We cannot, moreover, conceive how the remarkable instincts which they manifest can have been acquired originally, except by virtue of some such power. But the power in them now is evidently of a rudimentary kind, and must remain so while they have not those higher nerve-centres in which the sensations are combined into ideas, and perceptions of the relations of things are acquired. Granting, however, that the bee or ant has these traces of adaptive action

Unlike the bee and the ant, man must slowly learn the use of his senses and their respondent movements. This he does by virtue of the fundamental property of nerve-centres, whereby they react in a definite way to suitable impressions, organically register their experience, and so acquire by education their special faculties. Thus it is that many of the daily actions of our life, which directly follow impressions on the senses, take place in answer to sensations that are not perceived—become, so to speak, *instinctive;* some of them being not a whit less automatic than the instinctive acts of the bee, or the acts of the pigeon deprived of its hemispheres. When we move about in a room with the objects in which we are quite familiar, we direct our steps so as to avoid them, without being conscious what they are, or what we are doing; we *see* them, as we easily discover if we try to move about in the same way with our eyes shut, but we do not *perceive* them, the mind being fully occupied with some train of thought. In like manner, when we go through a series of familiar acts, as in dressing or undressing ourselves, the operations are really automatic; once begun, we continue them in a mechanical order, while the mind is thinking of other things; and if we afterward reflect upon what we have done, in order to call to mind whether we did or did not omit something, as for instance to wind up our watch, we cannot satisfy ourselves except by trial, even though we had actually done what we were in doubt about. It is evident, indeed, that in a state of profound reverie or abstraction a person may, as a somnambulist sometimes does, see without know-

It must be allowed that they are truly rudiments of functions, which in the supreme nerve-centres we designate as reason and volition. Such a confession might be a trouble to a metaphysical physiologist, who would thereupon find it necessary to place a metaphysical entity behind the so-called instincts of the bee, but can be no trouble to the inductive physiologist; he simply recognizes an illustration of a physiological diffusion of properties, and of the physical conditions of primitive volition, and traces in the evolution of mind and its organs, as in the evolution of other functions and their organs, a progressive specialization and increasing complexity.

ing that he sees, hear without knowing that he hears, and go through a series of acts scarcely, if at all, conscious of them at the time, and not remembering them afterward. For the most distinct display of sensori-motor action in man, it is necessary that his cerebral hemispheres, which are so largely developed, and intervene much in the functions of the subordinate centres, should be deeply engaged in their own functions, or that these should be suspended. This appears to be the case in those brief attacks of epileptic unconsciousness known as the *petit mal*, in which a person will sometimes go on with the work he was engaged in at the time of the attack, utterly unaware of the momentary interruption of his consciousness.* There are many instances of this sort on record, which I cannot stop to relate now; they prove how large a part sensori-motor functions, which are the highest nerve-functions of so many animals, play in our daily actions. We ought clearly to apprehend the fact that, as with the spinal cord, so here, the movements which take place in answer to the stimulus from without may be excited by the stimulus of the will descending from the hemispheres, and that, when they are so excited, the immediate agency of them is the same. The movements that are outwardly manifest are, as it were, contained inwardly in the appropriate motor nuclei; these have been educated to perform them. Hence it is that, when the left corpus striatum is broken up by disease, the right cannot do its special work; if it could, a man might write with his left hand when his right hand was disabled by paralysis.

Thus much, then, concerning our sensori-motor acts. When we have yielded up to the spinal cord all the part in our actions that properly belongs to it, and to the sensory ganglia and their connected motor nuclei all the part that belongs to them, we have subtracted no inconsiderable part from the phenomena which we are in the habit of designating

* For examples, I may refer to my work on "The Physiology and Pathology of Mind," 2d edition.

mental and including under mind. But we still leave untouched the highest functions of the nervous system—those to which the hemispherical ganglia minister. These are the functions of intelligence, of emotion, and of will; they are the strictly mental functions. The question at once arises whether we have to do in these supreme centres with fundamentally different properties and different laws of evolution from those which belong to the lower nerve-centres. We have to do with different functions certainly; but are the organic processes which take place in them essentially different from, or are they identical with, those of the lower nerve-centres? They appear to be essentially the same: there is a reception of impressions, and there is a reaction to impressions, and there is an organic registration of the effects both of the impressions and of the reactions to them. The external stimuli do not, it is true, ascend directly to the supreme centres as they do to the spinal centres and the sensory centres; they are transmitted indirectly through the sensory ganglia; it is through the senses that we get our ideas. This is in accordance with the anatomical observation—which, however, is disputed—that no sensory fibres go directly through to the hemispheres, and no motor fibres start directly from them; both sensory and motor fibres stopping at the corpora striata and thalami optici, and new fibres connecting these with the hemispheres. But this does not alter the fundamental similarity of the organic processes in the higher centres. The impressions which are made there are the physiological conditions of *ideas;* the feeling of the ideas is *emotion*—for I hold emotion to mean the special sensibility of the vesicular neurine to ideas—the registration of them is *memory;* and the reaction to them is *volition*. *Attention* is the maintenance of the tension of an idea or a group of ideas—the keeping it before the mind; and *reflection* is the successive transference of energy from one to another of a series of ideas. We know not, and perhaps never shall know, what mind is; but we are nevertheless bound to investigate,

in a scientific spirit, the laws of its functions, and to trace the resemblances which undoubtedly exist between them and the functions of lower nerve-centres.

Take, for example, the so-called faculty of memory, of which metaphysicians have made so much as affording us the knowledge of personal identity. From the way in which they usually treat of it, one would suppose that memory was peculiar to mind, and far beyond the reach of physical explanation. But a little reflection will prove that it is nothing of the kind. The acquired functions of the spinal cord, and of the sensory ganglia, obviously imply the existence of memory, which is indispensable to their formation and exercise. How else could these centres be educated? The impressions made upon them, and the answering movements, both leave their traces behind them, which are capable of being revived on the occasions of similar impressions. A ganglionic centre, whether of mind, sensation, or movement, which was without memory, would be an idiotic centre, incapable of being taught its functions. In every nerve-cell there is memory, and not only so, but there is memory in every organic element of the body. The virus of small-pox or of syphilis makes its mark on the constitution for the rest of life. We may forget it, but it will not forget us, though, like the memory of an old man, it may fade and become faint with advancing age. The manner in which the scar of a cut in a child's finger is perpetuated, and grows as the body grows, evinces, as Mr. Paget has pointed out, that the organic element of the part remembers the change which it has suffered. Memory is the organic registration of the effects of impressions, the organization of experience, and to recollect is to revive this experience—to call the organized residua into functional activity.

The fact that memory is accompanied by consciousness in the supreme centres does not alter the fundamental nature of the organic processes that are the condition of it. The more sure and perfect, indeed, memory becomes, the more uncon-

scious it becomes; and, when an idea or mental state has been completely organized, it is revived without consciousness, and takes its part automatically in our mental operations, just as an habitual movement does in our bodily activity. We perceive in operation here the same law of organization of conscious acquisitions as unconscious power, which we observed in the functions of the lower nerve-centres. A child, while learning to speak or read, has to remember the meaning of each word, must tediously exercise its memory; but which of us finds it necessary to remember the meanings of the common words which we are daily using, as we must do those of a foreign language with which we are not very familiar? We do remember them, of course, but it is by an unconscious memory. In like manner, a pupil, learning to play the piano-forte, is obliged to call to mind each note: but the skilful player goes through no such process of conscious remembrance; his ideas, like his movements, are automatic, and both so rapid as to surpass the rapidity of succession of conscious ideas and movements. To my mind, there are incontrovertible reasons to conclude that the organic conditions of memory are the same in the supreme centres of thought as they are in the lower centres of sensation and of reflex action. Accordingly, in a brain that is not disorganized by injury or disease, the organic registrations are never actually forgotten, but endure while life lasts; no wave of oblivion can efface their characters. Consciousness, it is true, may be impotent to recall them; but a fever, a blow on the head, a poison in the blood, a dream, the agony of drowning, the hour of death, rending the veil between our present consciousness and these inscriptions, will sometimes call vividly back, in a momentary flash, and call back too with all the feelings of the original experience, much that seemed to have vanished from the mind forever. In the deepest and most secret recesses of mind, there is nothing hidden from the individual self, or from others, which may not be thus some time accidentally revealed; so that it might well be

that, as De Quincey surmised, the opening of the book at the day of judgment shall be the unfolding of the everlasting scroll of memory.*

As it is with memory so is it with volition, which is a physiological function of the supreme centres, and which, like memory, becomes more unconscious and automatic the more completely it is organized by repeated practice. It is not man's function in life to think and feel only; his inner life he must express or utter in action of some kind—in word or deed. Receiving the impressions from Nature, of which he is a part, he reacts upon Nature intelligently, modifying it in a variety of ways; thus Nature passes through human nature to a higher evolution. As the spinal cord reacts to its impressions in excito-motor action, and as the sensory centres react to their impressions in sensori-motor action, so, after the complex interworking and combination of ideas in the hemispherical ganglia, there is, in like manner, a reaction or desire of determination of energy outward, in accordance with the fundamental property of organic structure to seek what is beneficial and shun what is hurtful to it. It is this property of tissue that gives the impulse which, when guided by intelligence, we call volition, and it is the abstraction from the particular volitions which metaphysicians personify as *the will*, and regard as their determining agent. Physiologically, we cannot choose but reject *the* will; volition we know, and will we know, but *the will*, apart from particular acts of volition or will, we cannot know. To interpose such a metaphysical entity between reflection and action thereupon would bring us logically to the necessity of interposing a similar entity between the stimulus to the spinal cord and its reaction. Thus, instead of unravelling the complex by help of the more simple, we should obscure the simple by

* An apt illustration, most true to Nature, of the recurrence of early impressions in the delirium of dying, is afforded by Falstaff, who, as he expires in a London tavern after a life of debauchery, babbles of green fields.

speculations concerning the complex. As physiologists, we have to deal with volition as a function of the supreme centres, following reflection, varying in quantity and quality as its cause varies, strengthened by education and exercise, enfeebled by disuse, decaying with decay of structure, and always needing for its outward expression the educated agency of the subordinate motor centres. We have to deal with will, not as a single undecomposable faculty unaffected by bodily conditions, but as a result of organic changes in the supreme centres, affected as certainly and seriously by disorder of them as our motor faculties are by disorder of their centres. Loss of power of will is one of the earliest and most characteristic symptoms of mental derangement; and whatever may have been thought in times past, we know well now that the loss is not the work of some unclean spirit that has laid its hands upon the will, but the direct effect of physical disease.

But I must pass on now to other matters, without stopping to unfold at length the resemblances between the properties of the supreme centres and those of the lower nerve-centres. We see that the supreme centres are educated, as the other centres are, and the better they are educated the better do they perform their functions of thinking and willing. The development of mind is a gradual process of organization in them. Ideas, as they are successively acquired through the gateways of the senses, are blended and combined and grouped in a complexity that defies analysis, the organic combinations being the physiological conditions of our highest mental operations—reflection, reasoning, and judgment. Two leading ideas we ought to grasp and hold fast: first, that the complex and more recondite phenomena of mind are formed out of the more simple and elementary by progressive specialization and integration; and, secondly, that the laws by means of which this formation takes place are not laws of association merely, but laws of organic combination and evolution. The growth of mental power means an actual addi

tion of structure to the intimate constitution of the centres of mind—a *mental organization* in them; and mental derangement means disorder of them, primary or secondary, functional or organic.

Although I have declared the hemispherical ganglia to be preëminently the mind-centres, and although it is in disorder of their functions—in disordered intelligence, in disordered emotion, and in disordered will—that insanity essentially consists, it is nevertheless impossible to limit the study of our mental operations to the study of them. They receive impressions from every part of the body, and, there is reason to believe, exert an influence on every element of it: there is not an organic motion, sensible or insensible, which does not, consciously or unconsciously, affect them, and which they in turn do not consciously or unconsciously affect. So intimate and essential is the sympathy between all the organic functions, of which mind is the crown and consummation, that we may justly say of it, that it sums up and comprehends the bodily life—that every thing which is displayed outwardly is contained secretly in the innermost. We cannot truly understand mind-functions without embracing in our inquiry all the bodily functions and, I might perhaps without exaggeration say, all the bodily features.

I have already shown this in respect of motor functions, by exhibiting how entirely dependent for its expression will is upon the organized mechanism of the motor centres—how, in effecting voluntary movements, it presupposes the appropriate education of the motor centres. Few persons, perhaps, consider what a wonderful art speech is, or even remember that it is an art which we acquire. But it actually costs us a great deal of pains to learn to speak; all the language which an infant has is a cry; and it is only because we begin to learn to talk when we are very young, and are constantly practising, that we forget how specially we have had to educate our motor centres of speech. Here, however, we come to another pregnant consideration: the acquired faculty of the

educated motor centre is not only a necessary agency in the performance of a voluntary act, but I maintain that it positively enters as a mental element into the composition of the definite volition; that, in fact, the specific motor faculty not only acts downward upon the motor nerves, thus executing the movement, but also acts upward upon the mind-centres, thereby giving to consciousness the conception of the suitable movement—the appropriate motor intuition. It is certain, that, in order to execute consciously a voluntary act, we must have in the mind a conception of the aim or purpose of the act. The will cannot act upon the separate muscles, it can only determine the result desired; and thereupon the combined contraction, in due force and rapidity, of the separate muscles takes place in a way that we have no consciousness of, and accomplishes the act. The infant directly it is born can suck, certainly not consciously or voluntarily; on the first occasion, at any rate, it can have no notion of the purpose of its movements; but the effect of the action is to excite in the mind the special motor intuition, and to lay the foundation of the special volition of it. We cannot do an act voluntarily unless we know what we are going to do, and we cannot *know exactly* what we are going to do until we have taught ourselves to do it. This exact knowledge of the aim of the act, which we get by experience, the motor intuition gives us.

The essential intervention of the motor intuition, which is, as it were, the abstract of the movement, in our mental life, is best illustrated by the movements of speech, but is by no means peculiar to them. Each word represents a certain association and succession of muscular acts, and is itself nothing more than a conventional sign or symbol to mark the particular muscular expression of a particular idea. The word has not independent vitality; it differs in different languages; and those who are deprived of the power of articulate speech must make use of other muscular acts to express their ideas, speaking, as it were, in a dumb discourse. There is no reason on earth, indeed, why a person might not learn to express

every thought which he can utter in speech by movements of his fingers, limbs, and body—by the silent language of gesture. The movements of articulation have not, then, a special *kind* of connection with the mind, though their connection is a specially intimate one; they are simply the most convenient for the expression of our mental states, because they are so numerous, various, delicate, and complex, and because, in conjunction with the muscles of the larynx and the respiratory muscles, they modify sound, and thus make audible language. Having, on this account, been always used as the special instruments of utterance, their connection with thought is most intimate; the Greeks, in fact, used the word λόγος to mean both reason and speech. But this does not make the relations of the movements of speech to mind different fundamentally from the relations of other voluntary movements to mind; and we should be quite as much warranted in assigning to the mind a special faculty of writing, of walking, or of gesticulating, as in speaking of a special faculty of speech in it.

What is true of the relations of articulate movements to mental states is true of the relations of other movements to mental states: they not only express the thought, but, when otherwise put in action, they can excite the appropriate thought. Speak the word, and the idea of which it is the expression is aroused, though it was not in the mind previously; or put other muscles than those of speech into an attitude which is the normal expression of a certain mental state, and the latter is excited. Most if not all men, when thinking, repeat internally, whisper to themselves, as it were, what they are thinking about; and persons of dull and feeble intelligence cannot comprehend what they read, or what is sometimes said to them, without calling the actual movement to their aid, and repeating the words in a whisper or aloud. As speech has become the almost exclusive mode of expressing our thoughts, there not being many gestures of the body which are the habitual expressions of simple ideas, we cannot present striking examples of the powers of other movements

to call up the appropriate ideas; yet the delicate muscular adaptations which effect the accommodation of the eye to vision at different distances seem really to give to the mind its ideas of distance and magnitude. No one actually sees distance and magnitnde; he sees only certain signs from which he has learned to judge intuitively of them—the muscular adaptations, though he is unconscious of them, imparting the suitable intuitions.

The case is stronger, however, in regard to our emotions. Visible muscular expression is to passion what language or audible muscular expression is to thought. Bacon rightly, therefore, pointed out the advantage of a study of the forms of expression. "For," he says, "the lineaments of the body do disclose the disposition and inclination of the mind in general; but the motions of the countenance and parts do not only so, but do further disclose the present humor and state of the mind or will." The muscles of the countenance are the chief exponents of human feeling, much of the variety of which is due to the action of the orbicular muscles with the system of elevating and depressing muscles. Animals cannot laugh, because, besides being incapable of ludicrous ideas, they do not possess in sufficient development the orbicular muscle of the lips and the straight muscles which act upon them. It is because of the superadded muscles and of their combined actions—not combined contraction merely, but consentaneous action, the relaxation of some accompanying the contraction of others—that the human countenance is capable of expressing a variety of more complex emotions than animals can. Those who would degrade the body, in order, as they imagine, to exalt the mind, should consider more deeply than they do the importance of our muscular expressions of feeling. The manifold shades and kinds of expression which the lips present—their gibes, gambols, and flashes of merriment; the quick language of a quivering nostril; the varied waves and ripples of beautiful emotion which play on the human countenance, with the spasms of

passion that disfigure it—all which we take such pains to embody in art—are simply effects of muscular action, and might be produced by electricity or any other stimulus, if we could only apply it in suitable force to the proper muscles. When the eye is turned upward in rapt devotion, in the ecstasy of supplication, it is for the same reason as it is rolled upward in fainting, in sleep, in the agony of death: it is an involuntary act of the oblique muscles, when the straight muscles cease to act upon it. We perceive, then, in the study of muscular action, the reason why man looks up to heaven in prayer, and why he has placed there the power "whence cometh his help." A simple property of the body, as Sir C. Bell observes—the fact that the eye in supplication takes what is its natural position when not acted upon by the will—has influenced our conceptions of heaven, our religious observances, and the habitual expression of our highest feelings.

Whether each passion which is special in kind has its special bodily expression, and what is the expression of each, it would take me too long to examine now. Suffice it to say that the special muscular action is not merely the expouent of the passion, but truly an essential part of it. Fix the countenance in the pattern of a particular emotion—in a look of anger, of wonder, or of scorn—and the emotion whose appearance is thus imitated will not fail to be aroused. And if we try, while the features are fixed in the expression of one passion, to call up in the mind a quite different one, we shall find it impossible to do so. This agrees with the experiments of Mr. Braid on persons whom he had put into a state of hypnotism; for, when the features or the limbs were made by him to assume the expression of a particular emotion, thereupon the emotion was actually felt by the patient, who began to act as if he was under its influence. We perceive then that the muscles are not alone the machinery by which the mind acts upon the world, but that their actions are essential elements in our mental operations. The superiority of the human over the animal mind seems to be

essentially connected with the greater variety of muscular action of which man is capable: were he deprived of the infinitely-varied movements of hands, tongue, larynx, lips, and face, in which he is so far ahead of the animals, it is probable that he would be no better than an idiot, notwithstanding he might have a normal development of brain.*

If these reflections are well grounded, it is obvious that disorder of the motor centres may have, as I believe it has, no little effect upon the phenomena of mental derangement. In some cases of insanity there are genuine muscular hallucinations, just as there are in dreams sometimes, when the muscles are in a constrained attitude; and, where the morbid effects are not so marked, there is good reason to suppose that a searching inquiry along this almost untrodden path will disclose the mode of generation of many delusions that seem now inexplicable.

But we cannot limit a complete study of mind even by a full knowledge of the functions of the nervous and muscular systems. The organic system has most certainly an essential part in the constitution and the functions of mind. In the great mental revolution caused by the development of the sexual system at puberty we have the most striking example of the intimate and essential sympathy between the brain as a mental organ and other organs of the body. The change of character at this period is not by any means limited to the appearance of the sexual feelings and their sympathetic ideas, but, when traced to its ultimate reach, will be found to extend to the highest feelings of mankind, social, moral, and even religious. In its lowest sphere, as a mere animal instinct, it is clear that the sexual appetite forces the most selfish person out of the little circle of self-feeling into a wider feeling of family sympathy and a rudimentary moral feeling. The consequence is that, when an individual is sexu-

* There may be no little truth, therefore, though not the entire truth, in the saying of Anaxagoras, that man is the wisest of animals by reason of his having hands.

ally mutilated at an early age, he is emasculated morally as well as physically. Eunuchs are said to be the most depraved creatures morally: they are cowardly, envious liars, utterly deceitful, and destitute of real social feeling. And there is certainly a characteristic variety of insanity caused by self-abuse, which makes the patient very like a eunuch in character.

It has been affirmed by seme philosophers that there is no essential difference between the mind of a woman and that of a man; and that if a girl were subjected to the same education as a boy, she would resemble him in tastes, feelings, pursuits, and powers. To my mind it would not be one whit more absurd to affirm that the antlers of the stag, the human beard, and the cock's comb, are effects of education; or that, by putting a girl to the same education as a boy, the female generative organs might be transformed into male organs. The physical and mental differences between the sexes intimate themselves very early in life, and declare themselves most distinctly at puberty: they are connected with the influence of the organs of generation. The forms and habits of mutilated men approach those of women; and women, whose ovaries and uterus remain from some cause in a state of complete inaction, approach the forms and habits of men. It is said, too, that in hermaphrodites the mental character, like the physical, participates equally in that of both sexes. While woman preserves her sex, she will necessarily be feebler than man, and, having her special bodily and mental characters, will have to a certain extent her own sphere of activity; where she has become thoroughly masculine in nature, or hermaphrodite in mind—when, in fact, she has pretty well divested herself of her sex—then she may take his ground, and do his work; but she will have lost her feminine attractions, and probably also her chief feminine functions.

Allowing that the generative organs have their specific effect upon the mind, the question occurs whether each of

the internal organs has not also a special effect, giving rise to particular feelings with their sympathetic ideas. They are notably united in the closest sympathy, so that, although insensible to touch, they have a sensibility of their own, by virtue of which they agree in a consent of functions, and respond more or less to one another's sufferings; and there can be no question that the brain, as the leading member of this physiological union, is sensible of, and affected by, the conditions of its fellow-members. We have not the same opportunity of observing the specific effects of other organs that we have in the case of the generative organs; for while those come into functional action directly after birth, these come into action abruptly at a certain period, and thus exhibit their specific effects in a decided manner. It may well be, however, that the general uniformity among men in their passions and emotions is due to the specific sympathies of organs, just as the uniformity of their ideas of external Nature is due to the uniform operation of the organs of sense.

It is probable that an exact observation of the mental effects of morbid states of the different organs would help the inquiry into the feelings and desires of the mind which owe their origin to particular organs. What are the psychological features of disease of the heart, disease of the lungs, disease of the liver? They are unquestionably different in each case. The inquiry, which has never yet been seriously attempted, is, without doubt, a difficult one, but I believe that the phenomena of dreams might, if carefully observed, afford some help. The ground-tone of feeling in a dream, the background on which the phantoms move, is often determined by the state of an internal organ, the irritation of which awakens into some degree of activity that part of the brain with which the organ is in specific sympathy; accordingly sympathetic ideas spring out of the feeling and unite in a more or less coherent dream-drama. How plainly this happens in the case of the generative organs it is unnecessary to point out: exciting their specific dreams, they teach a lesson concerning

physiological sympathies which, applied to the observation of the effects of other organs, may be largely useful in the interpretation, not of dreams only, but of the phenomena of insanity. Dreams furnish a particularly fruitful field for the study of the specific effects of organs on mind, because these effects are more distinctly felt and more distinctly declared when the impressions from the external senses are shut out by sleep. As the stars are not visible, although they still shine, in the daytime, so the effects of an internal organ may not be perceptible during the waking state while consciousness is actively engaged. But just as, when the sun goes down, the stars shine visibly, which before were invisible, veiled by his greater light, so when active consciousness is suspended, organic sympathies, which before were insensible, declare themselves in the mind. Perhaps it is in the excitation of its sympathetic feeling and ideas by a disordered organ during sleep that we may discover the explanation of a fact which seems to be undoubted, and to be more than accidental—namely, that a person has sometimes dreamed prophetically that he would have a particular internal disease, before he consciously felt a symptom of it, and has been afterward surprised to find his dream come true.

It is natural to suppose that the passion which a particular organ produces in the mind will be that which, when otherwise excited, discharges itself specially upon that organ. Notably this is the case with the sexual organs and the passion to which they minister. When we consider the effects which a joyful anticipation, or the elation of a present excitement, has upon the lungs—the accelerated breathing and the general bodily exhilaration which it occasions—we cannot help thinking of the strange hopefulness and the sanguine expectations of the consumptive patient, who, on the edge of the grave, projects, without a shadow of distrust, what he will do long after he will have been "green in death and festering in his shroud." Observe how fear strikes the heart, and what anxious fear and apprehension accompany some

affections of the heart. Anger, disappointment, and envy, notably touch the liver; which, in its turn, when deranged, engenders a gloomy tone of mind through which all things have a malignant look, and from which, when philosophy avails not to free us, the restoration of its functions will yield instant relief. The internal organs are plainly not the agents of their special functions only, but, by reason of the intimate consent or sympathy of functions, they are essential constituents of our mental life.

The time yet at my disposal will not allow me to do more than mention the effects of mental states on the intimate processes of nutrition and secretion. Emotion may undoubtedly favor, hinder, or pervert nutrition, and increase, lessen, or alter a secretion; in doing which there is reason to think that it acts, not only by dilating or contracting the vessels through the vaso-motor system, as we witness in the blush of shame and the pallor of fear, but also directly on the organic elements of the part through the nerves, which, as the latest researches seem to show, end in them sometimes by continuity of substance. If they do so end, it is difficult to conceive how a strong emotion vibrating to the ultimate fibrils of a nerve can fail to affect for a moment or longer the functions of the organic elements. Be this so or not, however, the familiar observations—first, that a lively hope or joy exerts an enlivening effect upon the bodily life, quiet and equable when moderate, but, when stronger, evinced in the brilliancy of the eye, in the quickened pulse and respiration, in an inclination to laugh and sing; and, secondly, that grief or other depressing passion has an opposite effect, relaxing the arteries, enfeebling the heart, making the eye dull, impeding digestion, and producing an inclination to sigh and weep—these familiar observations of opposite effects indicate the large part which mental states may play, not in the causation of all sorts of disease alone, but in aiding recovery from them. A sudden and great mental shock may, like a great physical shock, and perhaps in the same way, par-

alyze for a time all the bodily and mental functions, or cause instant death. It may, again, produce epilepsy, apoplexy, or insanity; while a prolonged state of depression and anxiety is sometimes an important agent in the causation of chronic disease, such as diabetes and heart-disease. Can it be doubted, too, that the strong belief that a bodily disorder will be cured by some appliance, itself innocent of good or harm, may so affect beneficially the nutrition of the part as actually to effect a cure? To me it seems not unreasonable to suppose that the mind may stamp its tone, if not its very features, on the individual elements of the body, inspiring them with hope and energy, or infecting them with despair and feebleness. A separated portion of the body, so little that our naked eye can make nothing of it, the spermatozoon of the male and the ovum of the female, does at any rate contain, in a latent state, the essential characters of the mind and body of the individual from whom it has proceeded; and, as we are utterly ignorant how this mysterious effect is accomplished, we are certainly not in a position to deny that what is true of the spermatozoon and ovum may be true of other organic elements. And, if this be so, then those who profess to discover the character of the individual in the character of the nose, the hand the features, or other part of the body, may have a foundation of truth for speculations which are yet only vague, fanciful, and valueless.

Perhaps we do not, as physicians, consider sufficiently the influence of mental states in the production of disease, and their importance as symptoms, or take all the advantage which we might take of them in our efforts to cure it. Quackery seems to have here got hold of a truth which legitimate medicine fails to appreciate and use adequately. Assuredly the most successful physician is he who, inspiring the greatest confidence in his remedies, strengthens and exalts the imagination of his patient: if he orders a few drops of peppermint-water with the confident air of curing the disease, will

he not really do more sometimes for the patient than one who treats him in the most approved scientific way, but without inspiring a conviction of recovery? Ceremonies, charms, gesticulations, amulets, and the like, have in all ages and among all nations been greatly esteemed and largely used in the treatment of disease; and it may be speciously presumed that they have derived their power, not from any contract with the supernatural, but, as Bacon observes, by strengthening and exalting the imagination of him who used them. Entirely ignorant as we are, and probably ever shall be, of the nature of mind, groping feebly for the laws of its operation, we certainly cannot venture to set bounds to its power over those intimate and insensible molecular movements which are the basis of all our visible bodily functions, any more than we can justly venture to set bounds to its action in the vast and ever-progressing evolution of Nature, of which all our thoughts and works are but a part. This much we do know: that as, on the one hand, in the macrocosm of Nature, it is certain that the true idea once evolved is imperishable—that it passes from individual to individual, from nation to nation, from generation to generation, becoming the eternal and exalting possession of man—so, on the other hand, in the microcosm of the body, which some ignorantly despise, there are many more things in the reciprocal action of mind and organic element than are yet dreamed of in our philosophy.

LECTURE II.

GENTLEMEN: In my last lecture I gave a general survey of the physiology of our mental functions, showing how indissolubly they are bound up with the bodily functions, and how barren must of necessity be a study of mind apart from body. I pointed out that the higher mental operations were functions of the supreme nerve-centres; but that, though of a higher and more complex nature than the functions of the lower nerve-centres, they obeyed the same physiological laws of evolution, and could be best approached through a knowledge of them. I now propose to show that the phenomena of the derangement of mind bear out fully this view of its nature; that we have not to deal with disease of a metaphysical entity, which the method of inductive inquiry cannot reach, nor the resources of the medical art touch, but with disease of the nervous system, disclosing itself by physical and mental symptoms. I say advisedly physical and mental, because in most, if not all, cases of insanity, at one period or other of their course, there are, in addition to the prominent mental features, symptoms of disordered nutrition and secretion, of disordered sensibility, or of disordered motility. Neither in health nor in disease is the mind imprisoned in one corner of the body; and, when a person is lunatic, he is, as Dr. Bucknill has remarked, lunatic to his fingers' ends.

Mental disorders are neither more nor less than nervous diseases in which mental symptoms predominate, and their entire separation from other nervous diseases has been a sad hin-

derance to progress. When a blow on the head has paralyzed sensibility and movement, in consequence of the disease in the brain which it has initiated, the patient is sent to the hospital; but when a blow on the head has caused mental derangement, in consequence of the disease of brain which it has initiated, the patient is sent to an asylum. In like manner, one man who has unluckily swallowed the eggs of a tænia, and has got a cysticercus in the brain, may go to the hospital; another who has been similarly unlucky goes to an asylum. Syphilitic disease of the brain or its arteries lands one person in an asylum with mental symptoms predominant, another in a hospital with sensory and motor disorder predominant. The same cause produces different symptoms, according to the part of the brain which it particularly affects. No doubt it is right that mental derangements should have, as they often require, the special appliances of an asylum, but it is certainly not right that the separation which is necessary for treatment should reach to their pathology and to the method of its study. So long as this is the case, we shall labor in vain to get exact scientific ideas concerning their causation, their pathology, and their treatment.

Clearing, then, the question as completely as possible from the haze which metaphysics has cast around it, let us ask—How comes idiocy, or insanity? What is the scientific meaning of them? We may take it to be beyond question that they are not accidents; that they come to pass, as every other event in Nature does, by natural law. They are mysterious visitations only because we understand not the laws of their production, appear casualties only because we are ignorant of their causality. When a blow on the head or an inflammation of the membranes of the brain has produced derangement of mind, we need not look farther for a cause: the actual harm done to structure is sufficient to account for disorder of function in the best-constituted and best-developed brain. But it is only in a small proportion of cases of insanity that we can discover such a direct physical occasion of disease.

In a great many cases—in more than half, certainly, and perhaps in five out of six—there is something in the nervous organization of the person, some native peculiarity, which, however we name it, predisposes him to an outbreak of insanity. When two persons undergo a similar moral shock, or a similar prolonged anxiety, and one of them goes mad in consequence, while the other goes to sleep and goes to work and recovers his equanimity, it is plain that all the coöperating conditions have not been the same, that the entire cause has been different. What, then, has been the difference? In the former case there has been present a most important element, which was happily wanting in the latter—there has been a certain hereditary neurosis, an unknown and variable quantity in the equation.

Perhaps of all the erroneous notions concerning mind which metaphysics has engendered or abetted, there is none more false than that which tacitly assumes or explicitly declares that men are born with equal original mental capacity, opportunities and education determining the differences of subsequent development. The opinion is as cruel as it is false. What man can by taking thought add one cubit either to his mental or to his bodily stature? Multitudes of human beings come into the world weighted with a destiny against which they have neither the will nor the power to contend; they are the step-children of Nature, and groan under the worst of all tyrannies—the tyranny of a bad organization. Men differ, indeed, in the fundamental characters of their minds, as they do in the features of their countenances, or in the habits of their bodies; and between those who are born with the potentiality of a full and complete mental development, under favorable circumstances, and those who are born with an innate incapacity of mental development, under any circumstances, there exists every gradation. What teaching could ever raise the congenital idiot to the common level of human intelligence? What teaching could ever keep the inspired mind of the man of genius at that level?

The congenital idiot is deprived of his human birthright; for he is born with such a defect of brain that he cannot display any, or can only display very feeble and imperfect mental functions. From no fault of his own is he thus afflicted, seeing that he must be held innocent of all offence but the offence of his share of original sin; but it is nowise so clear that it is not from some fault of his parents. It is all too true that, in many cases, there has observably been a neglect or disregard of the laws which govern the progress of human development through the ages. Idiocy is, indeed, a manufactured article; and, although we are not always able to tell how it is manufactured, still its important causes are known and are within control. Many cases are distinctly traceable to parental intemperance and excess. Out of 300 idiots in Massachusetts, Dr. Howe found as many as 145 to be the offspring of intemperate parents; and there are numerous scattered observations which prove that chronic alcoholism in the parent may directly occasion idiocy in the child. I think, too, that there is no reasonable question of the ill effects of marriages of consanguinity: that their tendency is to produce degeneracy of the race, and idiocy as the extremest form of such degeneracy. I do not say that *all* the children of such marriages may not sometimes be healthy, and *some* of them quite healthy at other times; but the general and ultimate result of breeding in and in is to produce barrenness and sterility, children of a low degree of viability and of imperfect mental and physical development, deaf-mutism, and actual imbecility or idiocy. Again, insanity in the parent may issue in idiocy in the offspring, which is, so to speak, the natural term of mental degeneracy when it goes on unchecked through generations. It may be affirmed with no little confidence that, if the experiment of intermarrying insane persons for two or three generations were tried, the result would be sterile idiocy and extinction of the family. Certain unfavorable conditions of life tend unquestionably to produce degeneracy of the individual; the morbid predispo-

sition so generated is then transmitted to the next generation, and, if the unfavorable conditions continue, is aggravated in it; and thus is formed a morbid variety of the human kind, which is incapable of being a link in the line of progress of humanity. Nature puts it under the ban of sterility, and thus prevents the permanent degradation of the race. Morel has traced through four generations the family history of a youth who was admitted into the asylum at Rouen in a state of stupidity and semi-idiocy; the summary of which may fitly illustrate the natural course of degeneracy when it goes on through generations.

First generation: Immorality, depravity, alcoholic excess and moral degradation, in the great-grandfather, who was killed in a tavern-brawl.

Second generation: Hereditary drunkenness, maniacal attacks, ending in general paralysis, in the grandfather.

Third generation: Sobriety, but hypochondriacal tendencies, delusions of persecutions, and homicidal tendencies in the father.

Fourth generation: Defective intelligence. First attack of mania at sixteen; stupidity, and transition to complete idiocy. Furthermore, probable extinction of the family; for the generative functions were as little developed as those of a child of twelve years of age. He had two sisters who were both defective physically and morally, and were classed as imbeciles. To complete the proof of heredity in this case, Morel adds that the mother had a child while the father was confined in the asylum, and that this adulterous child showed no signs of degeneracy.

When epilepsy in young children leads to idiocy, as it often does, we must generally look for the deep root of the mischief in the family neurosis.

No one can well dispute that, in the case of such an extreme morbid variety as a congenital idiot is, we have to do with a defective nervous organization. We are still, however, without more than a very few exact descriptions

of the brains of idiots. Mr. Marshall has recently examined and described the brains of two idiots of European descent. He found the convolutions to be fewer in number, individually less complex, broader and smoother, than in the apes: "In this respect," he says, "the idiots' brains are even more simple than that of the gibbon, and approach that of the baboon." The condition was the result neither of atrophy nor of mere arrest of growth, but consisted essentially in an imperfect evolution of the cerebral hemispheres or their parts, dependent on an arrest of development. The proportion of the weight of brain to that of body was extraordinarily diminished. We learn, then, that when man is born with a brain no higher—indeed, lower—than that of an ape, he may have the convolutions fewer in number, and individually less complex, than they are in the brain of a chimpanzee and an orang; the human brain may revert to, or fall below, that type of development from which, if the theory of Darwin be true, it has gradually ascended by evolution through the ages.

With the defect of organ there is a corresponding defect of function. But there is sometimes more than a simple defect. A curious and interesting fact, which has by no means yet received the consideration which it deserves, is that, with the appearance of this animal type of brain in idiocy, there do sometimes appear or reappear remarkable animal traits and instincts. There is a class of idiots which may justly be designated *theroid*, so like brutes are the members of it. The old stories of so-called wild men, such as Peter the wild boy, and the young savage of Aveyron, who ran wild in the woods and lived on acorns and whatever else they could pick up there, were certainly exaggerated at the time. These degraded beings were evidently idiots, who exhibited a somewhat striking aptitude and capacity for a wild animal life. Dr. Carpenter, however, quotes the case of an idiot girl, who was seduced by some miscreant, and who, when she was delivered, gnawed through the umbilical

cord as some of the lower animals do. And Dr. Crichton Brown, of the West Riding Asylum, records a somewhat similar case in a young woman, not an idiot naturally, but who had gone completely demented after insanity. She had been in the habit of escaping from home, and of living in solitude in the woods, feeding upon wild fruits or what she could occasionally beg at a cottage, and sleeping in the brushwood. She had frequently lived in this manner for a fortnight at a time. During one of these absences she was delivered of twins; she had sought out a sheltered hollow, and there, reverting to a primitive instinct, gnawed through the umbilical cord. The twins were alive when found two days after birth, but the mother was in a very exhausted state, having had no food or covering since her delivery. "We have at Salpêtrière," says Esquirol, "an imbecile woman, who used to earn a few sous by doing rough household work. It has happened on several occasions that as soon as she got her sous she took them to a laborer, and gave herself up to his brutality; but when she was pregnant she went no more to him."

In the conformation and habits of other idiots the most careless observer could not help seeing the ape. A striking instance of this kind is described by Dr. Mitchell, Deputy Commissioner in Lunacy for Scotland. "I have never," he says, "seen a better illustration of the ape-faced idiot than in this case. It is not, however, the face alone that is ape-like. He grins, chatters, and screams like a monkey, never attempting a sound in any way resembling a word. He puts himself in the most ape-like attitude in his hunts after lice, and often brings his mouth to help his hands. He grasps what he brings to his mouth with an apish hold. His thumbs are but additional fingers. He has a leaping walk. He has heavy eyebrows, and short hair on his cheek or face. He is muscular, active, and not dwarfish. He sits on the floor in ape fashion, with his genitals always exposed. He has filthy habits of all kinds. He may be called an idiot of the lowest

order; yet there is a mischievous brute-like intelligence in his eye. His head is not very small, its greatest circumference being twenty inches and a half, but in shape it strongly exhibits the ape-form of abnormality."

Pinel has recorded the case of an idiot who was something like a sheep, both in respect of her tastes, her mode of life, and the form of her head. She had an aversion to meat, and ate fruit and vegetables greedily, and drank nothing but water. Her demonstrations of sensibility, joy, or trouble, were confined to the repetition of the ill-articulated words, *bé*, *ma*, *bah*. She alternately bent and raised her head, and rubbed herself against the belly of the girl who attended her. If she wanted to resist or express her discontent, she tried to butt with the crown of her head; she was very passionate. Her back, her loins, and shoulders, were covered with flexible and blackish hairs one or two inches long. She never could be made to sit on a chair or bench, even when at meals; as soon as she was placed in a sitting posture, she glided on the floor. She slept on the floor in the posture of animals.

There is now under care, in the West Riding Asylum, a deformed idiot girl who, in general appearance and habits, has, according to Dr. Brown, striking features of resemblance to a goose; so much so, that the nurses who received her described her as just like "a plucked goose." Her father died in the asylum, and her mother's sister was also a patient in it at one time. She is four feet two inches in height, has a small head, and thin and scanty hair, so that the crown of the head is partially bald. The eyes are large, round, prominent, and restless, and are frequently covered by the eyelids, as if by a slow, forcible effort at winking. The lower jaw is large, projecting more than one inch beyond the contracted upper jaw, and possesses an extraordinary range of antero-posterior, as well as lateral, movement; the whole configuration of the lower part of the face having a somewhat bill-like appearance. The neck is unusually long and flexible, and is

capable of being bent backward so as actually to touch the back between the scapulæ. The cutis anserina is general over the body, but is most marked on the back and dorsal aspects of the limbs, where it looks exactly as if it had been just deprived of feathers. The inferior angles of the scapulæ stand prominently out, and moving freely with the movements of the arms have precisely the appearance of rudimentary wings. The girl utters no articulate sounds, but expresses pleasure by cackling like a goose, and displeasure by hissing or screeching like a goose, or perhaps like a macaw. When angry, she flaps her arms against her sides and beats her feet upon the floor. She knows her own name, and understands one or two short sentences, such as "Come here" and "Put out your hand." She recognizes the persons who attend upon her, and feed her, and is much agitated if touched by a stranger. She cannot feed herself, but swallows voraciously all that is put into her mouth, showing no preference for one article of diet over another. She is dirty in her habits, and no amount of attention has improved her in this respect. She is very fond of her bath, cackling when she is put into it, and screeching when she is taken out of it.*

It is a natural question, Whence come these animal traits

* The following account of an idiot in the Western Counties Idiot Asylum has been communicated to me by Mr. Kenton, surgeon to the Asylum: She is between 15 and 16 years old, has a very small head, but is well formed otherwise, and well nourished. She has little or no intellect, not being able to speak, and barely understanding a few signs. By careful treatment she has been taught to feed herself, but there her education has reached its limit. She has been left to herself, and watched with a view to observe her natural habits. When alone in the garden, she chooses a quiet spot among the shrubs, and, sitting down, will bend forward with her small head between her thighs, and occupy herself in picking imaginary insects from the adjacent parts of her body, pretending to pick them and to throw them away. She will then wander about, and finding a suitable bough, will swing by her hands, and then double her legs over the branch and swing with her head downward. She will steal any thing she fancies, and hide it away; will suddenly spring upon any child near and bite and scratch it, and then in a moment look as demure as if she had done nothing. At certain times she will go under the shrubs, scratch a hole with her hands in

and instincts in man? Whence was derived the instinct which taught the idiot woman to gnaw through the umbilical cord? Was it really the reappearance of a primitive instinct of animal nature—a faint echo from a far-distant past, testifying to a kinship which man has almost outgrown, or has grown too proud to acknowledge? No doubt such animal traits are marks of extreme human degeneracy, but it is no explanation to call them so; degenerations come by law, and are as natural as natural law can make them. Instead of passing them by as abnormal, or, worse still, stigmatizing them as unnatural, it behooves us to seek for the scientific interpretation which they must certainly have. When we reflect that every human brain does, in the course of its development, pass through the same stages as the brains of other vertebrate animals, and that its transitional states resemble the permanent forms of their brains; and when we reflect further, that the stages of its development in the womb may be considered the abstract and brief chronicle of a series of developments that have gone on through countless ages in Nature, it does not seem so wonderful, as at the first blush it might do, that it should, when in a condition of arrested development, sometimes display animal instincts. Summing up, as it were, in itself the leading forms of the vertebrate type, there is truly a brute brain within the man's; and when the latter stops short of its characteristic development as *human*—when it remains arrested at or below the level of an orang's brain—it may be presumed that it will manifest its most primitive functions, and no higher functions.

the ground, sit down upon it as a cat does, then turn round and carefully cover the spot by scraping the earth over it with her hands. She tears her clothes up into strips, and hides the pieces. Mr. Kenton mentions another idiot under his care, who puts every thing to his nose before putting it into his mouth. This he does, not hastily, but deliberately, examining each piece of food carefully by his sense of smell. He greatly dislikes butter, and will not eat pie-crust or any cooked food which contains butter, and he detects its presence with certainty by the sense of smell. He will not kiss any one till he has sniffed at the person first.

I am not aware of any other considerations than those just adduced which offer even the glimpse of an explanation of the origin of these animal traits in man. We need not, however, confine our attention to idiots only. Whence come the savage snarl, the destructive disposition, the obscene language, the wild howl, the offensive habits, displayed by some of the insane? Why should a human being deprived of his reason ever become so brutal in character as some do, unless he has the brute nature within him? In most large asylums there is one, or more than one, example of a demented person who truly ruminates: bolting his food rapidly, he retires afterward to a corner, where at his leisure he quietly brings it up again into the mouth and masticates it as the cow does. I should take up a long time if I were to enumerate the various brute-like characteristics that are at times witnessed among the insane; enough to say that some very strong facts and arguments in support of Mr. Darwin's views might be drawn from the field of morbid psychology. We may, without much difficulty, trace savagery in civilization, as we can trace animalism in savagery; and, in the degeneration of insanity, in the *unkinding*, so to say, of the human kind, there are exhibited marks denoting the elementary instincts of its composition.

It behooves us, as scientific inquirers, to realize distinctly the physical meaning of the progress of human intelligence from generation to generation. What structural differences in the brain are implied by it? That an increasing purpose runs through the ages and that "the thoughts of men are widened with the process of the suns," no one will call in question; and that this progress has been accompanied by a progressive development of the cerebral hemispheres, the convolutions of which have increased in size, number, and complexity, will hardly now be disputed. Whether the fragments of ancient human crania which have been discovered in Europe do or do not testify to the existence of a barbarous race that disappeared before historical time, they certainly

mark a race not higher than the lowest surviving human variety. Dr. Pritchard's comparison of the skulls of the same nation at different periods of its history led him to the conclusion that the present inhabitants of Britain, "either as the result of many ages of great intellectual cultivation or from some other cause, have much more capacious brain-cases than their forefathers." Yet stronger evidence of a growth of brain with the growth of intelligence is furnished by an examination of the brains of existing savages. Gratiolet has figured and described the brain of the Hottentot Venus, who was nowise an idiot. He found a striking simplicity and a regular arrangement of the convolution of the frontal lobes, which presented an almost perfect symmetry in the two hemispheres, involuntarily recalling the regularity and symmetry of the cerebral convolutions in the lower animals. The brain was palpably inferior to that of a normally-developed white woman, and could only be compared with the brain of a white idiotic from arrest of cerebral development. Mr. Marshall has also recently examined the brain of a Bush-woman, and has discovered like evidence of structural inferiority: the primary convolutions, although all present, were smaller and much less complicated than in the European; the external connecting convolutions were still more remarkably defective; the secondary sulci and convolutions were everywhere decidedly less developed; there was a deficiency of transverse commissural fibres; and in size, and every one of the signs of comparative inferiority, "it leaned, as it were, to the higher quadrumanous forms." The developmental differences between this brain and the brain of a European were in fact of the same kind as, though less in degree than, those between the brain of an ape and that of a man. Among Europeans the average weight of the brain is greater in educated than in uneducated persons; its size—other circumstances being equal—bearing a general relation to the mental power of the individual. Dr. Thurnam concludes, from a series of carefully-compiled tables, that while

the average weight of the brain in ordinary Europeans is 49 oz., it was 54.7 oz. in ten distinguished men; and Prof. Wagner found a remarkably complex arrangement of the convolutions in the brains of five very eminent men which he examined.* Thus, then, while we take it to be well established that the convolutions of the human brain have undergone a considerable development through the ages, we may no less justly conclude that its larger, more numerous, and complex convolutions reproduce the higher and more varied mental activity to the progressive evolution of which their progressive increase has answered—that they manifest the kind of function which has determined the structure. The vesicular neurine has increased in quantity and in quality, and the function of the increased and more highly-endowed structure is to display that intelligence which it un-

* The following table is compiled from Dr. Thurnam's paper "On the Weight of the Human Brain" (*Journal of Mental Science*, April, 1866):

BRAIN-WEIGHTS OF DISTINGUISHED MEN.

	Ages.	Oz.
1. Cuvier, *Naturalist*	63	64.5
2. Abercrombie, *Physician*	64	63
3. Spurzheim, *Physician*	56	55.06
4. Dirichlet, *Mathematician*	54	55.6
5. De Morny, *Statesman and Courtier*	50	53.6
6. Daniel Webster, *Statesman*	70	53.5
7. Campbell, *Lord-Chancellor*	80	53.5
8. Chalmers, *celebrated Preacher*	67	53
9. Fuchs, *Pathologist*	52	52.9
10. Gauss, *Mathematician*	78	52.6
Average of ten distinguished men	50–70	54.7
Brain-weights of average European men	20–60	49
	50–70	47.1
Average brain-weight of male negroes		44.3
" " 14 congenital idiots (males)		42
" " 8 " " (females)		41.2
Estimated brain-weight of Microcephalic idiocy (males)		37.5
" " " " (females)		32.5

It may be proper to add that the average weight of the adult male brain is 10 per cent. greater than that of the female—100 : 90. The brains of the Hottentot, Bushman, and Australian are, so far as observation goes, of less weight than those of negroes.

consciously embodies. The native Australian, who is one of the lowest existing savages, has no words in his language to express such exalted ideas as justice, love, virtue, mercy; he has no such ideas in his mind, and cannot comprehend them. The vesicular neurine which should embody them in its constitution and manifest them in its function has not been developed in his convolutions; he is as incapable therefore of the higher mental displays of abstract reasoning and moral feeling as an idiot is, and for a like reason. Indeed, were we to imagine a person born in this country, at this time, with a brain of no higher development than the brain of an Australian savage or a Bushman, it is perfectly certain that he would be more or less of an imbecile. And the only way, I suppose, in which beings of so low an order of development could be raised to a civilized level of feeling and thought would be by cultivation continued through several generations; they would have to undergo a gradual process of humanization before they could attain to the capacity of civilization.

Some, who one moment own freely the broad truth that all mental manifestations take place through the brain, go on, nevertheless, to straightway deny that the conscience or moral sensibility can be a function of organization. But, if all mental operations are not in this world equally functions of organization, I know not what warrant we have for declaring any to be so. The solution of the much-vexed question concerning the origin of the moral sense seems to lie in the considerations just adduced. Are not, indeed, our moral intuitions results of the operation of the fundamental law of nervous organization by which that which is consciously acquired becomes an unconscious endowment, and is then transmitted as more or less of an instinct to the next generation? They are examples of knowledge which has been hardly gained through the suffering and experience of the race, being now inherited as a natural or instinctive sensibility of the well-constituted brain of the individual. In the

matter of our moral feelings we are most truly the heirs of the ages. Take the moral sense, and examine the actions which it sanctions and those which it forbids, and thus analyze, or, as it were, decompose, its nature, and it will be found that the actions which it sanctions are those which may be proved by sober reason to be conducive to the well-being and the progress of the race, and that its prohibitions fall upon the actions which, if freely indulged in, would lead to the degeneration, if not extinction, of mankind. And if we could imagine the human race to live back again to its earliest infancy—to go backward through all the scenes and experiences through which it has gone forward to its present height—and to give back from its mind and character at each time and circumstance, as it passed it, exactly that which it gained when it was there before—should we not find the fragments and exuviæ of the moral sense lying here and there along the retrograde path, and a condition at the beginning which, whether simian or human, was bare of all true moral feeling?*

We are daily witnesses of, and our daily actions testify to, the operation of that plastic law of nervous organization by which separate and successive acquisitions are combined and so intimately blended as to constitute apparently a single and undecomposable faculty: we observe it in the formation of our volitions; and we observe it, in a more simple and less disputable form, in the way in which combinations of movements that have been slowly formed by practice are executed finally as easily as if they were a single and simple movement. If the moral sense—which is derived, then, insomuch as it has been acquired in the process of human development through the ages—were not more or less innate in the well-born individual of this age, if he were obliged to go, as the generations of his forefathers have gone, through

* Foster, in his "Essay on Decision of Character," makes this conception of the individual character, almost in the words used; but the application of it to the race, and the conclusion drawn, are of course not his.

the elementary process of acquiring it, he would be very much in the position of a person who, on each occasion of writing his name, had to go through the elementary steps of learning to do so. The progressive evolution of the human brain is a proof that we do inherit as a natural endowment the labored acquisitions of our ancestors; the added structure represents, as it were, the embodied experience and memories of the race; and there is no greater difficulty in believing that the moral sense may have been so formed, than in believing, what has long been known and is admitted on all hands, that the young fox or young dog inherits as an instinct the special cunning which the foxes and the dogs that have gone before it have had to win by hard experience.

These remarks are not an unnecessary digression. Nor will they have been made in vain if they serve to fix in our minds the conviction that the law of progressive evolution and specialization of nerve-centres, which may be traced generally from the first appearance of nerve-tissue in the lowest animals to the complex structure of the nervous system of man, and specially from the rudimentary appearance of cerebral convolutions in the lower vertebrata to the numerous and complex convolutions of the human brain, does not abruptly cease its action at the vesicular neurine of the hemispheres, but continues in force within the intimate recesses of the mental organization. Moreover, they are specially to the purpose, seeing that they enable us to understand in some sort how it is that a perversion or destruction of the moral sense is often one of the earliest symptoms of mental derangement: as the latest and most exquisite product of mental organization, the highest bloom of culture, it is the first to testify to disorder of the mind-centres. Not that we can detect any structural change in such case; it is far too delicate for that. The wonder would, indeed, be if we could discover such more than microscopical changes with the instruments of research which we yet possess. We might almost as well look to discover the anatomy of a gnat with a telescope.

I purposely selected for consideration the defective brain of the idiot, because it exhibits an undeniable fault of structure, which is often plainly traceable to evil ancestral influences. When we duly consider this, and reflect that we might, if we chose, arrange a series of human brains which should present a regular gradation from the brain of an ape to that of a well-developed European, are we not fully justified in supposing that like unfavorable ancestral influences may occasion defects in the constitution or composition of the mind-centres which we are yet quite unable to detect? We know nothing of the occult molecular movements which are the physical conditions of our mental operations; we know little or nothing of the chemical changes which accompany them—cannot, in fact, detect the difference between the nerve-element of a brain exhausted by exercise and incapable of further function, and that of a brain reinvigorated by sleep and ready for a day of energetic function; and we know nothing of the intricate connection of nerve-cells in the hemispheres. It is plain, then, that there may be, unknown to us save as guessed from their effects, the most important modifications in the molecular activities of nerve-element, changes in its chemical composition, and actual defects in the physical constitution of the nerve-centres. Wherefore, when no appreciable defect is found in the brain of one who has had a strong predisposition to insanity, and has ultimately died insane, it behooves us to forbear a hasty conclusion that it is a perfectly well-constituted brain. Close to us, yet inaccessible to our senses, there lies a domain of Nature—that of the infinitely little—the operations in which are as much beyond our present ken as are those that take place in the remotest regions of space, to which the eye, with all its aids, cannot yet reach, and of which the mind cannot conceive.

It certainly cannot be disputed that, when nothing abnormal whatever may be discoverable in the brains of persons who have a strong hereditary tendency to insanity, they often exhibit characteristic peculiarities in their manner of

thought, feeling, and conduct, carrying in their physiognomy, bodily habit, and mental disposition, the sure marks of their evil heritage. These marks are, I believe, the outward and visible signs of an inward and invisible peculiarity of cerebral organization. Here, indeed, we broach a most important inquiry, which has only lately attracted attention—the inquiry, namely, into the physical and mental signs of the degeneracy of the human kind. I do not mean to assert that all persons whose parents or blood relatives have suffered from nervous or mental disease exhibit mental and bodily peculiarities; some may be well formed bodily and of superior natural intelligence, the hereditary disposition in them not having assumed the character of deterioration of race; but it admits of no dispute that there is what may be called an *insane temperament* or *neurosis*, and that it is marked by peculiarities of mental and bodily conformation. Morel, who was the first to indicate, and has done much to prosecute, this line of inquiry, looks upon an individual so constituted as containing in himself the germs of a morbid variety: summing up the pathological elements which have been manifested by his ancestors, he represents the first term of a series which, if nothing happen to check the transmission of degenerate elements from generation to generation, ends in the extreme degeneracy of idiocy, and in extinction of the family.

What are the bodily and mental marks of the insane temperament? That there are such is most certain; for although the varieties of this temperament cannot yet be described with any precision, no one who accustoms himself to observe closely will fail to be able to say positively, in many instances, whether an insane person, and even a sane person in some instances, comes of an insane family or not. An irregular and unsymmetrical conformation of the head, a want of regularity and harmony of the features, and, as Morel holds, malformations of the external ear, are sometimes observed. Convulsions are apt to occur in early life, and there are tics, grimaces, or other spasmodic movements of muscles

of face, eyelids, or lips, afterward. Stammering and defects of pronunciation are also sometimes signs of the neurosis. In other cases there are peculiarities of the eyes, which, though they may be full and prominent, have a vacillating movement, and a vacantly-abstracted, or half-fearful, half-suspicious, and distrustful look. There may, indeed, be something in the eye wonderfully suggestive of the look of an animal. The walk and manner are uncertain, and, though not easily described in words, may be distinctly peculiar. With these bodily traits are associated peculiarities of thought, feeling, and conduct. Without being insane, a person who has the insane neurosis strongly marked is thought to be strange, queer, and not like other persons. He is apt to see things under novel aspects, or to think about them under novel relations, which would not have occurred to an ordinary mortal. Punning on words is, I am inclined to think, sometimes an indication of the temperament, and so also that higher kind of wit which startles us with the use of an idea in a double sense; of both which aptitudes no better example can be given than that of Charles Lamb. His case, too, may show that the insane temperament is compatible with, and indeed it not seldom coexists with, considerable genius. Even those who have it in a more marked form often exhibit remarkable special talents and aptitudes, such as an extraordinary talent for music, or for calculation, or a prodigious memory for details, when they may be little better than imbecile in other things. There is, indeed, a marked instinctive character in all they think and do; they seem not to need or to be able to reflect upon their own mental states. At one time unduly elated, at another time depressed without apparent cause, they are prone to do things differently from the rest of the world; and now and then they do whimsical and seemingly quite purposeless acts, especially under conditions of excitement, when the impulses springing out of the unconscious morbid nature surprise and overpower them. Indeed, the mental balance may be easily upset altogether by

any great moral shock, or by the strain of continued anxiety. A great physical change in the system, too, such as is caused by the development of puberty, by the puerperal state, and the climacteric change, is not without danger to their mental stability. The effects of alcohol on such persons are in some respects special: it does not make them so much drunk as mad for the time being; and I think it will be found in most, if not all, cases of insanity caused by alcohol that there has been a predisposition to it.

I have sketched generally the features of the insane temperament, but there are really several varieties of it which need to be observed and described. In practice we meet with individuals representing every gradation from the mildest form of the insane temperament down to actual idiocy. These cases ought to be arranged in groups according to their affinities, for until this be done we shall not make much real progress toward exact scientific notions respecting the causation and pathology of insanity. One group might consist of those egotistic beings, having the insane neurosis, who manifest a peculiar morbid suspicion of every thing and everybody; they detect an interested or malicious motive in the most innocent actions of others, always looking out for an evil interpretation; and even events they regard as in a sort of conspiracy against them. Incapable of altruistic reflection and true sympathies, they live a life of solitude and self-brooding, intrenched within their morbid self-feeling, until the discord between them and the world is so great that there is nothing for it but to count them mad. Another group might be made of those persons of unsound mental temperament who are born with an entire absence of the moral sense, destitute of the possibility even of moral feeling; they are as truly insensible to the moral relations of life, as deficient in this regard, as a person color-blind is to certain colors, or as one who is without ear for music is to the finest harmonies of sound. Although there is usually conjoined with this absence of moral sensibility more or less weakness

of mind, it does happen in some instances that there is a remarkably acute intellect of the cunning type.

The observations of intelligent prison-surgeons are tending more and more to prove that a considerable proportion of criminals are weak-minded or epileptic, or come of families in which insanity, epilepsy, or some other neurosis, exists. Mr. Thompson, surgeon to the General Prison of Scotland, has gone so far recently as to express his conviction that the principal business of prison-surgeons must always be with mental defects or disease; that the diseases and causes of death among prisoners are chiefly of the nervous system; and, in fine, that the treatment of crime is a branch of psychology. He holds that there is among criminals a distinct and incurable *criminal class*, marked by peculiar low physical and mental characteristics; that crime is hereditary in the families of criminals belonging to this class; and that this hereditary crime is a disorder of mind, having close relations of nature and descent to epilepsy, dipsomania, insanity, and other forms of degeneracy. Such criminals are really *morbid varieties*, and often exhibit marks of physical degeneration—spinal deformities, stammering, imperfect organs of speech, club-foot, cleft-palate, hare-lip, deafness, paralysis, epilepsy, and scrofula. Moreau relates a striking case, which is of interest as indicating the alliance between morbid or degenerate varieties, and which I may quote here.

Mrs. D——, aged thirty-two. Her grandfather kept an inn at the time of the great French Revolution, and during the Reign of Terror he had profited by the critical situation in which many nobles of the department found themselves to get them secretly into his house, where he was believed to have robbed and murdered them. His daughter, who was in his secrets, having quarrelled with him, denounced him to the authorities, but he escaped conviction from want of proofs. She subsequently committed suicide. One of her brothers had nearly murdered her with a knife on one occasion, and another brother hanged himself. Her sister was epileptic,

imbecile, and paroxysmally violent. Her daughter, the patient, after swimming in the head, noises in the ears, flashes before the eyes, became deranged, fancying that people were plotting against her, purchasing arms and barricading herself in her room, and was finally put in an asylum. Thus there were, in different members of this family, crime, melancholia, epilepsy, suicide, and mania. Need we wonder at it? The moral element is an essential part of a complete and sound character; he who is destitute of it, being unquestionably to that extent a defective being, is therefore on the road to, or marks, race degeneracy; and it is not a matter of much wonder that his children should, when better influences do not intervene to check the morbid tendency, exhibit a further degree of degeneracy, and be actual morbid varieties. I think that no one who has studied closely the causation of insanity will question this mode of production.

I could not, if I would, in the present state of knowledge, describe accurately all the characteristics of the insane neurosis, and group according to their affinities the cases testifying to its influence. The chief concern now with its morbid peculiarities is to point out, first, that they mark some inherited fault of brain-organization; and, secondly, that the cause of such fault is not insanity alone in the parent, but may be other nervous disease, such as hysteria, epilepsy, alcoholism, paralysis, and neuralgia of all kinds. Except in the case of suicidal insanity, it is not usual for the parent to transmit to the child the particular form of mental derangement from which he has suffered: insanity in the parent may be epilepsy in the child, and epilepsy in the parent insanity in the child; and, in families where a strong tendency to insanity exists, one member may be insane, another epileptic, a third may suffer from severe neuralgia, and a fourth may commit suicide. The morbid conditions which affect the motor nerve-centres in one generation seem to concentrate themselves sometimes upon the sensory or the ideational centres in another. In truth, nervous disease is a veritable Proteus, dis-

appearing in one form to reappear in another, and, it may be, capriciously skipping one generation to fasten upon the next.

The different forms of insanity that occur in young children—as all forms of it except general paralysis may do—are almost always traceable to nervous disease in the preceding generation, a neuropathic condition being really the essential element in their causation. The cases of acute mania in children of a few weeks or a few years old, which have been described, might more properly be classed as examples of idiocy with excitement. There can be no true mania until there is some mind. But we do meet sometimes in older children with a genuine acute mania, occurring usually in connection with chorea or epilepsy, and presenting the symptoms, if I may so express it, of a mental chorea or an epilepsy of the mind, but without the spasmodic and convulsive movements of these diseases. More or less dulness of intelligence and apathy of movement, giving the seeming of a degree of imbecility, is common enough in chorea, and in some cases there is violent delirium; but, besides these cases, there are others in which, without choreic disorder of movements, there is a choreic mania: it is an active delirium of ideas which is the counterpart of the usual delirium of movements, and its automatic character and its marked incoherence are striking enough to an ordinary observer. Hallucinations of the special senses, and loss or perversion of general sensibility, usually accompany the delirium, the disorder affecting the centres of special and general sensation, as well as the mind-centres.

Between this choreic mania and epileptic mania there are intermediate conditions partaking more or less of the character of one or the other—hybrid forms of a cataleptic nature. The child will lie for hours or days in a seeming ecstasy or trance, with its limbs rigid or fixed in a strange posture. There may be apparent insensibility to impressions, while at other times vague answers are given, or there is a sudden bursting out into wild shrieks or incoherent raving. If this

be of a religious kind, the child is apt to be thought by ignorant persons to be inspired. The attacks are of variable duration, and are repeated at varying intervals. On the one hand, they pass into attacks of chorea; and, on the other hand, into true epileptic seizures, or alternate with them.

In children, as in adults, a brief attack of violent mania, a genuine *mania transitoria*, may precede, or follow, or take the place of an epileptic fit; in the latter case being a masked epilepsy. Children of three or four years of age are sometimes seized with attacks of violent shrieking, desperate stubbornness, or furious rage, when they bite, tear, kick, and do all the destruction they can; these seizures, which are a sort of vicarious epilepsy, come on periodically, and may either pass in the course of a few months into regular epilepsy, or may alternate with it. Older children have perpetrated crimes of a savage and determined nature—incendiarism and even murder—under the influence of similar attacks of transitory fury, followed or not by epileptic convulsions. It is of the utmost importance to realize the deep effect which the epileptic neurosis may have on the moral character, and to keep in mind the possibility of its existence when a savage, apparently motiveless, and unaccountable crime has been committed. A single epileptic seizure has been known to change entirely the moral character, rendering a child rude, vicious, and perverse, who was hitherto gentle, amiable, and tractable. No one who has seen it can fail to have been struck with the great and abrupt change in moral character which takes place in the asylum epileptic immediately before the recurrence of his fits; in the intervals between them he is often an amiable, obliging, and industrious being, but when they impend he becomes sullen, morose, and most dangerous to meddle with. Not an attendant but can then foretell that he is going to have his fits, as confidently almost as he can foretell that the sun will rise next day. Morel has made the interesting observation, which is certainly well founded, that the epileptic neurosis may exist for a considerable period in

an undeveloped or masked form, showing itself, not by convulsions, but by periodic attacks of mania, or by manifestations of extreme moral perversion, which are apt to be thought wilful viciousness. But they are not: no moral influence will touch them; they depend upon a morbid physical condition, which can only have a physical cure; and they get their explanation, and indeed justification, afterward, when actual epilepsy occurs.

The epileptic neurosis is certainly most closely allied to the insane neurosis; and when it exists in its masked form, affecting the mind for some time before convulsions occur, it is hardly possible to distinguish it from one form of the insane neurosis. The difficulty of doing so is made greater, inasmuch as epilepsy in the parent may engender the insane neurosis in the child, and insanity in the parent the epileptic neurosis in the child. A character which the insane neurosis has in common with the epileptic neurosis is, that it is apt to burst out in a convulsive explosion of violence; that when it develops into actual insanity it displays itself in deeds rather than in words—in an insanity of action rather than of thought. It is truly a *neurosis spasmodica*. Take, for example, a case which is one of a class, that of the late Alton murderer, who, taking a walk one fine afternoon, met some little girls at play, enticed one of them into a neighboring hop-garden, there murdered her and cut her body into fragments, which he scattered about, returned quietly home, openly washing his hands in the river on the way, made an entry in his diary, "Killed a little girl; it was fine and hot;" and, when forthwith taken into custody, confessed what he had done, and could give no reason for doing it. At the trial it was proved that his father had had an attack of acute mania, and that another near relative was in confinement, suffering from homicidal mania. He himself had been noted as peculiar; he had been subject to fits of depression, been prone to weep without apparent reason, and had exhibited singular caprices of conduct; and it had once been necessary

to watch him from fear that he might commit suicide. He was not insane in the legal or the ordinary sense of the term, but he certainly had the insane neurosis, and it may be presnmed confidently that he would, had he lived, have become insane.

Those who have practical experience of insanity know well that there is a most distressing form of the disease; in which a desperate impulse to commit suicide or homicide overpowers and takes prisoner the reason. The terrible impulse is deplored sometimes by him who suffers from it as deeply as by any one who witnesses it; it causes him unspeakable distress; he is fully conscious of its nature, and struggles in vain against it; his reason is no further affected than in having lost power to control, or having become the slave of, the morbid and convulsive impulse. It may be that this form of derangement does sometimes occur where there is no hereditary predisposition to insanity, but there can be no doubt that in the great majority of cases of the kind there is such a neuropathic state. The impulse is truly a convulsive idea, springing from a morbid condition of nerve-element, and it is strictly comparable with an epileptic convulsion. How grossly unjust, then, the judicial criterion of responsibility which dooms an insane person of this class to death if he knew what he was doing when he committed a murder! It were as reasonable to hang a man for not stopping by an act of will a convulsion of which he was conscious. An interesting circumstance in connection with this morbid impulse is that its convulsive activity is sometimes preceded by a feeling very like the *aura epileptica*—a strange morbid sensation, beginning in some part of the body, and rising gradually to the brain. The patient may accordingly give warning of the impending attack in some instances, and in one case was calmed by having his thumbs loosely tied together with a ribbon when the forewarning occurred. Dr. Skae records an instructive example in one of his annual reports. The feeling began at the toes, rose gradually to the chest, producing a

sense of faintness and constriction, and then to the head, producing a momentary loss of consciousness. This aura was accompanied by an involuntary jerking—first of the legs, and then of the arms. It was when these attacks came on that the patient felt impelled to commit some act of violence against others or himself. On one occasion he attempted to commit suicide by throwing himself into the water; more often the impulse was to attack others. He deplored his condition, of which he spoke with great intelligence, giving all the details of his past history and feelings. In other cases a feeling of vertigo, a trembling, and a vague dread of something fearful being about to happen, resembling the vertigo and momentary vague despair of one variety of the epileptic aura, precede the attack. Indeed, whenever a murder has been committed suddenly, without premeditation, without malice, without motive, openly, and in a way quite different from the way in which murders are commonly done, we ought to look carefully for evidence of previous epilepsy, and, should there have been no epileptic fits, for evidence of an *aura epileptica* and other symptoms allied to epilepsy.

It is worth while observing that in other forms of insanity, when we look closely into the symptoms, there are not unfrequently complaints of strange, painful, and distressing sensations in some part of the body, which appear to have a relation to the mental derangement not unlike that which the epileptic aura has to the epileptic fit. Common enough is a distressing sensation about the epigastrium: it is not a definite pain, is not comparable strictly to a burning, or weight, or to any known sensation, but is an indescribable feeling of distress to which the mental troubles are referred. It sometimes rises to a pitch of anguish, when it abolishes the power to think, destroys the feeling of identity, and causes such unspeakable suffering and despair that suicide is attempted or accomplished. In other cases the distressing and indescribable sensation is in the crown of the head or down the spine, and sometimes it arises from the pelvic organs. In

all cases the patients connect their mental trouble with it, regarding it as the cause of the painful confusion of thought, the utter inability of exertion, the distressing ideas, and the paroxysm of despair. Perhaps they exaggerate its importance; but there can be little doubt that writers on mental disorders, too exclusively occupied with the prominent mental features, have not hitherto given sufficient attention to these anomalous sensations. We have been apt to class them as hypochondriacal, and to pass them over as of no special significance; but I cannot help thinking that, properly studied, they may sometimes teach us more of the real nature of the particular form of insanity—of its probable course, termination, and its most suitable treatment—than many much more obtrusive symptoms.

In bringing this lecture to an end, I may fitly point out how entirely thus far the observation of the phenomena of defective and disordered mind proves their essential dependence on defective and disordered brain, and how closely they are related to some other disordered nervous functions. The insane neurosis which the child inherits in consequence of its parent's insanity is as surely a defect of physical nature as is the epileptic neurosis to which it is so closely allied. It is an indisputable though extreme fact that certain human beings are born with such a native deficiency of mind that all the training and education in the world will not raise them to the height of brutes; and I believe it to be not less true that, in consequence of evil ancestral influences, individuals are born with such a flaw or warp of Nature that all the care in the world will not prevent them from being vicious or criminal, or becoming insane. Education, it is true, may do much, and the circumstances of life may do much; but we cannot forget that the foundations on which the acquisitions of education must rest are not acquired, but inherited. No one can escape the tyranny of his organization; no one can elude the destiny that is innate in him, and which unconsciously and irresistibly shapes his ends, even when he be-

lieves that he is determining them with consummate foresight and skill. A well-grounded and comprehensive theory of mind must recognize and embrace these facts; they meet us every moment of our lives, and cannot be ignored if we are in earnest in our attempts to construct a mental science; and it is because metaphysical mental philosophy has taken no notice whatever of them, because it is bound by the principle of its existence as a philosophy to ignore them, that, notwithstanding the labor bestowed on it, it has borne no fruits—that, as Bacon said of it, "not only what was asserted once is asserted still, but what were questions once are questions still, and, instead of being resolved by discussion, are only fixed and fed."

LECTURE III.

GENTLEMEN: In my last lecture I showed how large a part in the production of insanity is played by the hereditary neurosis, and pointed out the necessity of scrutinizing more closely than has yet been done the features of the different forms of mental derangement that own its baneful influence. Past all question it is the most important element in the causation of insanity. It cannot be in the normal order of events that a healthy organism should be unable to bear ordinary mental trials, much less a natural physiological function such as the evolution of puberty, the puerperal state, or the climacteric change. When, therefore, the strain of grief or one of these physiological conditions becomes the occasion of an outbreak of insanity, we must look for the root of the ill in some natural infirmity or instability of nerve-element. Not until we apply ourselves earnestly to an exact observation and discrimination of all the mental and bodily conditions which coöperate in the causation, and are manifested in the symptoms, of the manifold varieties of insanity, shall we render more precise and satisfactory our knowledge of its causes, its classification, and its treatment. How unscientific it appears when we reflect, to enumerate, as is commonly done, sex and age among its predisposing causes! No one goes mad because he or she happens to be a man or a woman, but because to each sex, and at certain ages, there occur special physiological changes, which are apt to run into pathological effects in persons predisposed to nervous dis-

order. How often it happens that a moral cause of insanity is sought and falsely found in a state of mind such as grief or jealousy, which is really an early symptom of the disease! Again, how vague and unsatisfactory the accepted psychological classification of insanity, under which forms of disease distinct enough to claim separate descriptions are included in the same class! It is obvious that we learn very little of value from an account of the treatment of mania generally when there are included under the class diseases so different as puerperal mania, the mania of general paralysis, syphilitic, epileptic, and hysterical mania, each presenting features and requiring treatment in some degree special. The hope and the way of advance in our knowledge of mental disorders lie in the exact observation of the varieties of the insane diathesis, and of the effects of bodily functions and disorders upon these; in noting carefully the bodily as well as mental symptoms that characterize the several forms of derangement of mind; and in tracing the relations of mental to other disorders of the nervous system. We must aim to distinguish well if we would teach well—to separate the cases that exhibit special features and relations, and to arrange them in groups or classes according to their affinities, just as we do habitually with general paralysis, and as I did in my last lecture with epileptic mania.

Following this plan, we might in like manner make of *hysterical* insanity a special variety. An attack of acute maniacal excitement, with great restlessness, rapid and disconnected but not entirely incoherent conversation, sometimes tending to the erotic or obscene, evidently without abolition of consciousness; laughing, singing, or rhyming, and perverseness of conduct, which is still more or less coherent and seemingly wilful—may occur in connection with, or instead of, the usual hysterical convulsions. Or the ordinary hysterical symptoms may pass by degrees into chronic insanity. Loss of power of will is a characteristic symptom of hysteria in all its Protean forms, and with the perverted sensations

and disordered movements there is always some degree of moral perversion. This increases until it swallows up the other symptoms: the patient loses more and more of her energy and self-control, becoming capriciously fanciful about her health, imagining or feigning strange diseases, and keeping up the delusion or the imposture with a pertinacity that might seem incredible, getting more and more impatient of the advice and interference of others, and indifferent to the interests and duties of her position. Outbursts of temper become almost outbreaks of mania, particularly at the menstrual periods. An erotic tinge may be observable in her manner of behavior; and occasionally there are quasi-ecstatic or cataleptic states. It is an easily-curable form of derangement if the patient be removed in time from the anxious but hurtful sympathies and attentions of her family, and placed under good moral control; but, if it be allowed to go on unchecked, it will end in dementia, and it is especially apt to do so when there is a marked hereditary predisposition.

In some instances we observe a curious connection between insanity and neuralgia, not unlike that which, existing between epilepsy and a special form of neuralgia, induced Trousseau to describe the latter as epileptiform. I have under observation now a lady who suffered for some time from an intense neuralgia of the left half of the face; after the removal of a tooth suspected to be at the root of the mischief the pain ceased, but an attack of melancholia immediately followed. Griesinger mentions a similar case of a gentleman under his care, in whom a double occipital neuralgia was followed by a melancholic state of mind. In his "Commentaries on Insanity," Dr. Burrows tells of a very eloquent divine who was always maniacal when free from pains in the spine, and sane when the pains returned to that site. And the late Sir B. Brodie mentions two cases of a similar kind: in one of them a neuralgia of the vertebral column alternated with true insanity. These cases appear to be instances of the transference of morbid action from one nerve-centre to

another, such as Dr. Darwin formerly noticed and commented on. "Mrs. C——," he says, "was seized every day, about the same hour, with violent pain in the right side of her bowels, about the situation of the lower edge of the liver, without fever, which increased for an hour or two, till it became quite intolerable. After violent screaming she fell into convulsions, which terminated sometimes in fainting, with or without stertor, as in common epilepsy; at other times a temporary insanity supervened, which continued about half an hour, and the fit ceased." It seems not unreasonable to suppose that the morbid action in the sensory centres, which the violent neuralgia implied, was at one time transferred to the motor centres, giving rise to convulsive movements, and at another time to the mind-centres, giving rise to convulsive ideas. There is a form of neuralgia which is the analogue of a convulsion, and there is a mania which is the counterpart, in the highest nerve-centres, of neuralgia and convulsions in their respective centres. Perhaps if we had the power in some cases of acute insanity to induce artificially a violent neuralgia, or general convulsions—to transfer the morbid action from the mind-centres—we might, for the time being at any rate, cure the insanity.

I pass on now to exhibit the effects of organic sympathies in the causation of mental disorders, or rather the specific effects of particular organs upon the features of different forms of insanity. In my first lecture I pointed out that there is the closest physiological consent of functions between the different organs; that the brain, as the organ of mind, joins in this consent; and that our ideas and feelings are obtained by the concurrence of impressions from the internal organs of the body and the external organs of the senses. The consequence is, that derangement of an internal organ, acting upon the brain, may engender, by pathological sympathy, morbid feelings and their related ideas. The mental effects may be general or specific: a general emotional depression through which all ideas loom gloomy, of which

every one's experience testifies; and a special morbid feeling with its particular sympathetic ideas, of which the phenomena of dreaming and insanity yield illustrations.

The slight shades of this kind of morbid influence we cannot venture to trace; but it is easy to recognize the most marked effects. Take, for example, the irritation of ovaries or uterus, which is sometimes the direct occasion of *nymphomania*—a disease by which the most chaste and modest woman is transformed into a raging fury of lust. Some observers have, without sufficient reason I think, made of *nymphomania* a special variety, grouping under the term cases in which it was a prominent symptom. But it certainly occurs in forms of mania that are quite distinct—in puerperal mania, for example, in epileptic mania, and in the mania sometimes met with in old women; and the cases in which it does occur have not such characteristic features as warrant the formation of a definite group. We have, indeed, to note and bear in mind how often sexual ideas and feelings arise and display themselves in all sorts of insanity; how they connect themselves with ideas which in a normal mental state have no known relation to them; so that it seems as inexplicable that a virtuous person should ever have learned, as it is distressing that she should manifest, so much obscenity of thought and feeling. Perhaps it is that such ideas are excited sympathetically in a morbidly active brain by unrelated ideas, just as, in other nervous disorders, sympathetic morbid sensations and movements occur in parts distant from the seat of the primary irritation. Considering, too, what an important agent in the evolution of mind the sexual feeling is, how much of thought, feeling, and energy it remotely inspires, there is less cause for wonder at the naked intervention of its simple impulses in the phenomena of mania, when coördination of function is abolished in the supreme centres, and the mind resolved, as it were, into its primitive animal elements. This should teach us to take care not to attribute too hastily the sexual feelings to a morbid irritation of the

sexual organs. It is plain that they may have a purely central origin, just as the excitation of them in health may proceed from the mind. Here, in fact, as in other cases, we must bear in mind the reciprocal influence of mind on organ, and of organ on mind.

The great mental revolution which occurs at puberty may go beyond its physiological limits, in some instances, and become pathological. The vague feelings, blind longings, and obscure impulses, which then arise in the mind, attest the awakening of an impulse which knows not at first its aim or the means of its gratification; a kind of vague and yearning melancholy is engendered, which leads to an abandonment to poetry of a gloomy Byronic kind, or to indulgence in indefinite religious feelings and aspirations. There is a want of some object to fill the void in the feelings, to satisfy the undefined yearning—a need of something to adore; consequently, where there is no visible object of worship the invisible is adored. The time of this mental revolution is, at best, a trying period for youth; and, where there is an inherited infirmity of nervous organization, the natural disturbance of the mental balance may easily pass into actual destruction of it.

The form of derangement connected with this period of life I believe to be either a fanciful and quasi-hysterical melancholia, which is not very serious when it is properly treated; or an acute mania, which is apt to be recurrent, and is much more serious. The former occurs especially in girls, if it be not peculiar to them; there are periods of depression and paroxysms of apparently causeless weeping, alternating with times of undue excitability, more especially at the menstrual periods; a disinclination is evinced to work, to rational amusement, to exertion of any kind; the behavior is capricious, and soon becomes perverse and wilful; the natural affections seem to be blunted or abolished, the patient taking pleasure in distressing those whose feelings she would most consider when in health; and, although there are no fixed

delusions, there are unfounded suspicions or fears and changing morbid fancies. The anxious sympathies of those most dear are apt to foster the morbid self-feeling which craves them, and thus to aggravate the disease: what such patients need to learn is, not the indulgence but a forgetfulness of their feelings, not the observation but the renunciation of self, not introspection but useful action. In some of these cases, where the disease has become chronic, delusions of sexual origin occur, and the patient whose virginity is intact imagines that she is pregnant or has had a baby.

The morbid self-feeling that has its root in the sexual system is not unapt to take on a religious guise. We observe examples of this in certain members of those latter-day religious sects which profess to commingle religion and love, and which especially abound in America. No physiologist can well doubt that the holy kiss of love in such cases owes all its warmth to the sexual feeling which consciously or unconsciously inspires it, or that the mystical union of the sexes lies very close to a union that is nowise mystical, when it does not lead to madness. A similar intimate connection between fanatical religious exaltation and sexual excitement is exemplified by the lives of such religious enthusiasts as St. Theresa and St. Catherine de Sienne, whose nightly trances and visions, in which they believed themselves received as veritable spouses into the bosom of Christ and transported into an unspeakable ecstasy by the touch of His sacred lips, attested, though they knew it not, the influence of excited sexual organs on the mind. More extreme examples of a like pathological action are afforded by those insane women who believe themselves to be visited by lovers or ravished by persecutors during the night. Sexual hallucinations, betraying an ovarian or uterine excitement, might almost be described as the characteristic feature of the insanity of old maids; the false visions of unreal indulgence being engendered probably in the same way as visions of banquets occur in the dreams of a starving person, or as visions of cooling streams to one

who is perishing of thirst. It seems to be the fact that, although women bear sexual excesses better than men, they suffer more than men do from the entire deprivation of sexual intercourse.

The development of puberty may lead indirectly to insanity by becoming the occasion of a vicious habit of self-abuse in men; and it is not always easy to say in such cases how much of the evil is due to pubescence and how much to self-abuse. But the form of mental derangement directly traceable to self-abuse has certainly characteristic features. There are no acute symptoms, the onset of the disease being most gradual. The patient becomes offensively egotistic and impracticable; he is full of self-feeling and self-conceit; insensible to the claims of others upon him, and of his duties to them; interested only in hypochondriacally watching his morbid sensations, and attending to his morbid feelings. His mental energy is sapped; and though he has extravagant pretensions, and often speaks of great projects engendered by his conceit, he never works systematically for any aim, but exhibits an incredible vacillation of conduct, and spends his days in indolent and suspicious self-brooding. His relatives he thinks hostile to him, because they do not take the interest in his sufferings which he craves, nor yield sufficiently to his pretensions, but perhaps urge him to some kind of work; he is utterably incapable of conceiving that he has duties to them. As matters get worse, the general suspicion of the hostility of people takes more definite form, and delusions spring up that persons speak offensively of him, or watch him in the street, or comment on what passes in his mind, or play tricks upon him by electricity or mesmerism, or in some other mysterious way. His delusions are the objective explanation, by wrong imagination, of the perverted feelings. Messages may be received from Heaven by peculiar telegraphic signals; and there are occasionally quasi-cataleptic trances. It is strange what exalted feelings and high moral and religious aims these patients will often declare they have, who, incapa-

ble of reforming themselves, are ready to reform the world. A later and worse stage is one of moody or vacant self-absorption, and of extreme loss of mental power. They are silent, or, if they converse, they discover delusions of a suspicious or obscene character, the perverted sexual passion still giving the color to their thoughts. They die miserable wrecks at the last. This is a form of insanity which certainly has its special exciting cause and its characteristic features; nevertheless, I think that self-abuse seldom, if ever, produces it without the coöperation of the insane neurosis.

The monthly activity of the ovaries which marks the advent of puberty in women has a notable effect upon the mind and body; wherefore it may become an important cause of mental and physical derangement. Most women at that time are susceptible, irritable, and capricious, any cause of vexation affecting them more seriously than usual; and some who have the insane neurosis exhibit a disturbance of mind which amounts almost to disease. A sudden suppression of the menses has produced a direct explosion of insanity; or, occurring some time before an outbreak, it may be an important link in its causation. It is a matter also of common experience in asylums, that exacerbations of insanity often take place at the menstrual periods; but whether there is a particular variety of mental derangement connected with disordered menstruation, and, if so, what are its special features, we are not yet in a position to say positively. There is certainly a recurrent mania, which seems sometimes to have, in regard to its origin and the times of its attacks, a relation to the menstrual function, suppression or irregularity of which often accompanies it; and it is an obvious presumption that the mania may be a sympathetic morbid effect of the ovarian and uterine excitement, and may represent an exaggeration of the mental irritability which is natural to women at that period. The patient becomes elated, hilarious, talkative, passing soon from that condition into a state of acute and noisy mania, which may last for two or three

weeks or longer, and then sinking into a brief stage of more or less depression or confusion of mind, from which she awakens to calmness and clearness of mind. In vain we flatter ourselves with the hope of a complete recovery; after an interval of perfect lucidity, of varying duration in different cases, the attack recurs, goes through the same stages, and ends in the same way, only to be followed by other attacks, until at last, the mind being permanently weakened, there are no longer intervals of entire lucidity. Could we stop the attacks, the patient might still regain by degrees mental power; but we cannot. All the resources of our art fail to touch them, and I know no other form of insanity which, having so much the air of being curable, thus far defies all efforts to stay its course. We should be apt to conclude that it was connected with the menstrual function, were it not that periodicity is more or less the law of all nervous diseases, that its attacks often recur at uncertain intervals, and, more decisive still, that it is not confined to women, but occurs perhaps as often in men. Whether connected or not, however, in any way with the generative functions, it certainly presents features of relationship to epilepsy, and occurs where the insane neurosis exists; and, if I were to describe it in a few words, I should designate it an epilepsy of the mind. Its recurrence more or less regularly; the uniformity of the prodromata and of the symptoms of the attack, each being almost an exact image of the other; its comparatively brief duration; the mental torpor or confusion which follows it, and the ignorance or denial sometimes, on the part of the patient, of his having had the attack; the temporary recovery; and the undoubted fact that it often occurs where there is evidence of an insane neurosis produced by epilepsy, or insanity, or both, in the family; these are facts which support the opinion of its kinship to epilepsy. I have under my care an unmarried lady who for many years has been subject to these recurrent attacks of mania, and whose intelligence has now been destroyed by them; ulti-

mately true epileptic fits supervened, but they only occur, at long intervals, usually not oftener than twice a year, while the maniacal attacks recur regularly every three or four weeks. It is of some interest, in regard to the question of its nature, that the age of its most frequent outbreak is, as it is with epilepsy, the years that cover the development of puberty. Irregularity or suppression of menstruation may or may not be present, so that we are not warranted in attributing the disease to amenorrhœa or dysmenorrhœa; we are the less warranted in doing so, as any form of insanity, however caused, may occasion a suppression of the menses.

The natural cessation of menstruation at the change of life is accompanied by a revolution in the economy which is often trying to the mental stability of those who have a predisposition to insanity. The age of pleasing is past, but not always the desire, which, indeed, sometimes grows then more exacting; there are all sorts of anomalous sensations of bodily distress, attesting the disturbance of circulation and of nerve functions; and it is now that an insane jealousy and a propensity to stimulants are apt to appear, especially where there have been no children. When positive insanity breaks out, it usually has the form of profound melancholia, with vague delusions of an extreme character, as that the world is in flames, that it is turned upside down, that every thing is changed, or that some very dreadful but undefined calamity has happened or is about to happen. The countenance has the expression of a vague terror and apprehension. In some cases short and transient paroxysms of excitement break the melancholy gloom. These usually occur at the menstrual periods, and may continue to do so for some time after the function has ceased. It is not an unfavorable form of insanity as regards probability of recovery under suitable treatment.

Continuing the consideration of the influence of the generative organs in the production of insanity, I come now to puerperal insanity. Under this name are sometimes con-

founded three distinct varieties of disease—that which occurs during pregnancy, that which follows parturition and is properly puerperal, and that which comes on months afterward during lactation.* The insanity of pregnancy is, as a rule, of a marked melancholic type, with suicidal tendency; a degree of mental weakness or apparent dementia being sometimes conjoined with it. Other cases, however, exhibit much moral perversion, perhaps an uncontrollable craving for stimulants, which we may regard as an exaggerated display of the fanciful cravings from which women suffer in the earlier months of pregnancy. We can hardly fail, indeed, to recognize a connection between the features of this form of insanity and the strange longings, the capriciousness, and the morbid fears, of the pregnant woman. The patient may be treated successfully by removal from home; but, if the disease be allowed to go on, there is no good ground to expect that parturition will have a beneficial effect upon it; on the contrary, the probability is, that it will run into a severe puerperal insanity, and from that into dementia.

Puerperal insanity proper comes on within one month of parturition; and, like the insanity of pregnancy, occurs most often in primiparæ. The statistics of the Edinburgh Asylum show that in all the cases occurring before the sixteenth day after labor, as most cases do, the symptoms were those of acute mania; but in all the cases which occurred after the sixteenth day they were those of melancholia. In both forms, but especially in the latter, there is sometimes a mixture of childishness and apparent dementia. The mania is more likely than the melancholia to get well. It is of an acute and extremely incoherent character, a delirious rather than a systematized mania, marked by noisy restlessness, sleeplessness, tearing of clothes, hallucinations, and in some cases by great salacity, which is probably the direct mental effect of the irritation of the generative organs. Suicide may be attempted

* "The Insanity of Pregnancy, Puerperal Insanity, and Insanity of Lactation." By J. Batty Tuke, M. D.

in an excited, purposeless way. The bodily symptoms, contradicting the violence of the mental excitement, indicate feebleness; the features are pinched; the skin is pale, cold, and clammy; and the pulse is quick, small, and irritable. We may safely say that recovery takes place in three out of four cases of puerperal mania, usually in a few weeks; the patient, after the acute symptoms have subsided, sinking into a temporary state of confusion and feebleness of mind, and then waking up as from a dream. I may add the expression of a conviction that no good, but rather harm, is done by attempting to stifle this or any other form of acute insanity by the administration of large doses of opium.

The insanity of lactation does not come under the scheme of this lecture; for it is an asthenic insanity, produced by bodily exhaustion and the depression of mental worries. The time of its occurrence seems to show that the longer the child is suckled the greater is the liability to it; and in the majority of cases it has the form of melancholia, often with determined suicidal tendency.

So frequently is hereditary predisposition more or less distinctly traceable in these three forms of insanity occurring in connection with child-bearing, that we are warranted in declaring it quite exceptional for any one of them to be met with where it is entirely absent.

I have now enumerated all the forms of insanity which, being specially connected with the generative organs, present characteristic features. It is certain, however, that disease of them may act as a powerful coöperating cause in the production of insanity, without giving rise, so far as we know, to a special group of symptoms. Thus, for example, melancholia, distinguishable by no feature from melancholia otherwise caused, may be the effect of disease of the uterus. Schröder van der Kölk mentions the case of a woman profoundly melancholic who suffered from prolapsus uteri, and in whom the melancholia disappeared when the uterus was returned to its proper place. Flemming relates two similar

cases in which melancholia was cured by the use of a pessary, the depression returning in one of them whenever the pessary was removed; and I have met with one case in which profound melancholia of two years' standing disappeared after the removal of a prolapsus uteri. Other diseases and displacements of the uterus may act in a similar way.

Let me now say a few words concerning the abdominal organs. No one will call in question that the states of their functions do exert a positive influence on our states of mind; but it is unfortunately too true that we cannot yet refer any special mental symptoms to the influence of the abdominal organs. I have met with one case of severe melancholia, of long standing, which was distinctly cured by the expulsion of a tape-worm; and it appears to be tolerably certain that hypochondriacal insanity is in some instances connected with, if not caused by, a perverted sensation proceeding from an internal organ, most often abdominal. In health we are not conscious of the impressions which these organs make upon the brain, albeit they assuredly send their unperceived contributions to the stream of energies of which consciousness is the sum and the outcome; but, when a disordered organ sends a morbid impression to the brain, it no longer does its work there in silence and self-suppression, but asserts itself in an unwonted affection of consciousness. The hypochondriac cannot withdraw his attention from the morbid sensation to which it is irresistibly attracted, and which it aggravates; his interest in all things else is gradually quenched, and his ability to think and act freely in the relations of life sapped. The step from this state to positive insanity is not a great one: the strange and distressing sensation, being so anomalous, so unlike any thing of which the patient has had experience, affecting him so powerfully and so unaccountably, gets at last an interpretation that seems suited to its extraordinary character; and he then imagines that some animal or man or devil has got inside him and is tormenting him. He has now a hallucination of the organic sense which

dominates his thoughts, and he is truly insane. Not long since I saw a patient who believed that he had a man in his belly; when his bowels were constipated, the delusion became active, he made desperate efforts by vomiting to get rid of his tormentor, and was then surly, morose, and dangerous; but, when his bowels had been relieved, the delusion subsided into the background, and he was good-tempered and industrious. If a patient, instead of attributing his sufferings to an absurdly impossible cause, ascribes them to a serious internal disease which he certainly has not got, there will be a difficulty in deciding whether he is insane or not, should he do injury to himself or others, as hypochondriacal melancholics sometimes do. It is a probable surmise that in those cases of insanity in which there are such delusions as that food will not enter the stomach, that there is no digestion, that the intestines are sealed up, there is a cause in a morbid irritation ascending from the viscera to the brain. I am furthermore disposed to think that a form of fearful melancholia in which the patient evinces an extreme morbid sensitiveness to his every thought, feeling, and act, in which he is, as it were, hypochondriacally distressed about whatever he thinks, feels, and does, imagining it, however trivial and innocent, to be a great sin, which has cost him his happiness in time and eternity, has its foundation in certain morbid states of abdominal sensation. In cases of this sort, the delusion is not the cause of the feeling of despair, but is, as it were, a condensation from it, and an attempted interpretation of it. The same thing is observed in dreams: the images and events of a distressing dream are not the causes of the feelings, but are caused by them; they undergo strange and sudden metamorphoses without causing much or any surprise, and they disappear together with the terror the moment we awake, which would not be the case if they really caused the terror. We perceive, indeed, in this generation of the image out of the feeling, the demonstration of the true nature of ghosts and apparitions; the nervous system being in an excited

state of expectant fear, and the images being the effects and exponents of the feeling: they give the vague terror form. Accordingly, as Coleridge has remarked, those who see a ghost under such circumstances do not suffer much in consequence, though in telling the story they will perhaps say that their hair stood on end, and that they were in an agony of terror; whereas those who have been really frightened by a figure dressed up as a ghost have often suffered seriously from the shock, having fainted, or had a fit, or gone mad. In like manner, if an insane person actually saw the dreadful things which he imagines that he sees sometimes, and really thought the terrible thoughts which he imagines he thinks, he would suffer in health more than he does, if he did not actually die of them.

I come now to the thoracic organs. The heart and the lungs are closely connected in their functions, so that they mutually affect one another. Some diseases of the lungs greatly oppress and trouble the heart; yet there is reason to believe that they have their special effects upon the mind. How, indeed, can we think otherwise when we contrast the sanguine confidence of the consumptive patient with the anxious fear and apprehension exhibited in some diseases of the heart? It used to be said that disease of the heart was more frequent among the insane than among the sane; but the latest observations do not afford any support to the opinion, nor do they furnish valid grounds to connect a particular variety of insanity with heart-disease in those cases in which it does exist. All that we are thus far warranted in affirming is, that if there be a characteristic mental effect of such disease, it is a great fear, mounting up at times to despairing anguish; and perhaps I may venture to add that, if there be a variety of mental disorder specifically connected with heart-disease, it is that form of melancholia in which the patient is overwhelmed with a vague and vast apprehension, where there is not so much a definite delusion as a dreadful fear of every thing actual and possible, and which is sometimes described as *panphobia.*

There has long been an opinion, which seems to be well founded, that tubercle of the lungs is more common among the insane than among the sane. For although the proportion of deaths in asylums attributed to phthisis is one-fourth, which is the same proportion as that for the sane population above fourteen years of age, Dr. Clouston has shown, by careful scrutiny of the records of 282 *post-mortem* examinations made in the Edinburgh Asylum, that phthisis was the assigned cause of death in only a little more than half of the cases in which there was tubercle in the body. The symptoms of phthisis are so much masked in the insane, there being usually no cough and no expectoration, that its diagnosis is difficult, and it is not always detected during life. The relation between it and insanity has been noticed by several writers: Schröder van der Kolk was distinctly of opinion that an hereditary predisposition to phthisis might predispose to, or develop into, insanity, and, on the other hand, that insanity predisposed to phthisis; and Dr. Clouston found that hereditary prediposition to insanity existed in seven per cent. more of the insane who were tubercular than of the insane generally. When family degeneration is far gone, the two diseases appear to occur frequently, and the last member is likely to die insane or phthisical, or both; whether, therefore, they mutually predispose to one another or not, they are often concomitant effects in the course of degeneration. However, in weighing the specific value of these observations, we must not forget that, independently of any special relation, the enfeebled nutrition of tuberculosis will tend to stimulate into activity the latent predisposition to insanity; and that, in like manner, insanity, especially in its melancholic forms, will favor the actual development of a predisposition to phthisis.

In the cases in which the development of phthisis and insanity has been nearly contemporaneous, which are about one-fourth of the cases in which they coexist, the mental symptoms are of so peculiar and uniform a character as to

have led to the inclusion of the cases in a natural group under the designation of *phthisical mania.* They have no positively distinctive symptom, it is true; they cannot be separated from other cases by a well-defined line of demarcation. Yet they do exhibit, Dr. Clouston believes, certain common and uniform characters which justify their description as a separate variety. They often begin in an insidious way by irritability, waywardness, and capriciousness of conduct, and apparent weakening of intellect; yet the patient converses rationally when he chooses to talk, and shows that he still has his intellect, albeit there is a great disinclination to exert it. To sign a certificate of his insanity would be no easy matter. Or they begin with an acutely maniacal or melancholic stage, which is, however, of very short duration, soon passing into a half-maniacal, half-demented state. If there be a single characteristic feature, it is a monomania of suspicion. As the disease advances, the symptoms of dementia predominate; but there are occasional brief attacks of irritable excitement and fitful flashes of intelligence. And in these cases, more often than in other cases, there occurs a momentary revival of intelligence before death. We shall the more readily admit the special features of phthisical mania when we call to mind that there is in most phthisical patients a peculiar mental state; and that brief attacks of temporary mania or delirium sometimes occur in the course of phthisis. The phthisical patient is irritable, fanciful, unstable of purpose, brilliant, and imaginative, but wanting in calmness and repose, quick of insight, but without depth and comprehension; every thing is fitful—fitful energy, fitful projects, fitful flashes of imagination. The hectic is in his thoughts and in his actions. The whims and imaginings of his mind become almost wanderings at times, his fancies almost delusions.

I have now said enough concerning the sympathetic mental effects of disordered organs, not certainly to set forth adequately their nature, but to show the essential importance

of a careful study of them. To complete the exposition of the action of pathological sympathies on mind, it would be necessary to trace out the close relations that there are between the organic feelings and the different kinds of special sensibility—between systemic and sense consciousness. The digestive organs have a close sympathy with the sense of taste, as we observe in the bad taste accompanying indigestion, in the nausea and vomiting which a nauseous taste may cause, and in the avoidance of poisonous matter by animals. The respiratory organs and the sense of smell are, in like manner, sympathetically associated; and there can be no doubt that the sense of smell has special relations with the sexual feeling. The state of the digestive organs notably affects the general sensibility of the skin. Disturbances of these physiological sympathies may become the occasions of insane delusions. Digestive derangement, perverting the taste, will engender a delusion that the food is poisoned. Disease of the respiratory organs appears sometimes to produce disagreeable smells, which are then perhaps attributed to objective causes, such as the presence of a corpse in the room, or to gases maliciously disseminated in it by fancied persecutors. In mania, smell and taste are often grossly perverted, for the patient will devour, with seeming relish and avidity, dirt and garbage of the most offensive kind. Increase, diminution, or perversion of the sensibility of the skin, one or other of which is not uncommon among the insane, may undoubtedly be the cause of extravagant delusions. We hardly, indeed, realize how completely the mind is dependent upon the habit of its sensations. The man who has lost a limb can hardly be persuaded that he has lost it, so sensible is he of the accustomed feelings in it; years after he has lost it he dreams of vivid sensations and of active movements in it—has, in fact, both sensory and motor hallucinations. It is easy, then, to understand how greatly abnormal sensations may perplex and deceive the unsound mind. A woman under Esquirol's care had complete anæsthesia of the skin: she

believed that the devil had carried off her body. A soldier who was wounded at the battle of Austerlitz lost the sensibility of his skin, and from that time thought himself dead. When asked how he was, he replied, "Lambert no longer lives; a cannon-ball carried him away at Austerlitz. What you see is not Lambert, but a badly-imitated machine," which he always spoke of as *it*. A patient under my care, who suffered from general paralysis, and had lost sensibility and voluntary power of one side, could never be persuaded that another patient, a very harmless fellow, had not got hold of him, and was keeping him down; and when convulsions occurred in the paralyzed side, as they did from time to time, he swore terribly at his fancied tormentor. Were a sane person to wake up some morning with the cutaneous sensibility gone, or with a large area of it sending up to the brain perverted and quite unaccountable impressions, it might be a hard matter perhaps for him to help going mad.

The mental effects of perverted sensation afford a promising field for future research; when better understood it cannot be doubted that they will explain many phenomena in the pathology of mind that now quite baffle explanation. It behooves us to clearly realize the broad fact, which has most wide-reaching consequences in mental physiology and pathology, that all parts of the body, the highest and the lowest, have a sympathy with one another more intelligent than conscious intelligence can yet, or perhaps ever will, conceive; that there is not an organic motion, visible or invisible, sensible or insensible, ministrant to the noblest or to the most humble purposes, which does not work its appointed effect in the complex recesses of mind; that the mind, as the crowning achievement of organization, and the consummation and outcome of all its energies, really comprehends the bodily life.

I had originally set down within the purpose of these Lectures the consideration, which I must now forego, of the influence of the quantity and quality of the blood in the production of insanity. Poverty and vitiation of blood may

certainly play a weighty part in producing mental, as they do in producing other nervous disorders. Lower the supply of blood to the brain below a certain level, and the power of thinking is abolished; the brain will then no more do mental work than a water-wheel will move the machinery of the mill when the water is lowered so as not to touch it. When a strong emotion produces a temporary loss of consciousness, it is to be presumed that a contraction of arteries takes place within the brain similar to that which causes the pallor of the face; and when the laboring heart pumps hard to overcome the obstruction, and the walls of the vessels are weak, they may burst, and the patient die of effusion of blood. During sleep the supply of blood to the brain is lessened naturally, and we perceive the effects of the lowering of the supply, as it takes place, in the sort of incoherence or mild delirium of ideas just before falling off to sleep. To a like condition of things we ought most probably to attribute the attacks of transitory mania or delirium that occur now and then in consequence of great physical exhaustion, as from great and sudden loss of blood, or just as convalescence from fever or other acute disease is setting in, or in the prostration of phthisis, and which a glass of wine opportunely given will sometimes cure. The distress of the melancholic patient is greatest when he wakes in the morning, which is a time when a watch ought to be kept specially over the suicidal patient; the reason lying probably in the effects of the diminished cerebral circulation during sleep.

If the state of the blood be vitiated by reason of some poison bred in the body, or introduced into it from without, the mental functions may be seriously deranged. We are able, indeed, by means of the drugs at our command, to perform all sorts of experiments on the mind: we can suspend its action for a time by chloral or chloroform, can exalt its functions by small doses of opium or moderate doses of alcohol, can pervert them, producing an artificial delirium, by the administration of large enough doses of belladonna and Indian

hemp. We can positively do more experimentally with the functions of the mind-centres than we can do with those of any other organ of the body. When these are exalted in consequence of a foreign substance introduced into the blood, it cannot be doubted that some *physical* effect is produced on the nerve-element, which is the condition of the increased activity, not otherwise probably than as happens when a fever makes, as it certainly will sometimes do, a demented person, whose mind seemed gone past all hope of even momentary recovery, quite sensible for the time being. Perhaps this should teach us that, just as there are vibrations of light which we cannot see, and vibrations of sound which we cannot hear, so there are molecular movements in the brain which are incapable of producing thought ordinarily, not sufficing to affect consciousness, but which may do so when the sensibility of the molecules is exalted by physical or chemical modification of them.

Alcohol yields us, in its direct effects, the abstract and brief chronicle of the course of mania. At first there is an agreeable excitement, a lively flow of ideas, a revival of old ideas and feelings which seemed to have passed from the mind, a general increase of mental activity—a condition very like that which often precedes an attack of acute mania, when the patient is witty, lively, satirical, makes jokes or rhymes, and certainly exhibits a brilliancy of fancy which he is capable of at no other time. Then there follows, in the next stage of its increasing action, as there does in mania, the automatic excitation of ideas which start up and follow one another without order, so that thought and speech are more or less incoherent, while passion is easily excited. After this stage has lasted for a time, in some longer, in others shorter, it passes into one of depression and maudlin melancholy, just as mania sometimes passes into melancholia, or convulsion into paralysis. And the last stage of all is one of stupor and dementia. If the abuse of alcohol be continued for years, it may cause different forms of mental derangement, in each of

which the muscular are curiously like the mental symptoms: delirium tremens in one, an acute noisy and destructive mania in another, chronic alcoholism in a third, and a condition of mental weakness with loss of memory and loss of energy in a fourth.

Writers on gout agree that a suppressed gout may entail mental derangement in some persons; and, on the other hand, that insanity has sometimes disappeared with the appearance of the usual gouty paroxysm. Sydenham noticed and described a species of mania supervening on an epidemic of intermittent fever, which, he remarks, contrary to all other kinds of madness, would not yield to plentiful venesection and purging. Griesinger, again, has directed attention to cases in which, instead of the usual symptoms of ague, the patient has had an intermittent insanity in regular tertian or quartan attacks, and has been cured by quinine. We must bear in mind, however, that intermittence may be a feature of insanity as of other nervous diseases, without ague having any thing whatever to do with it, and without quinine doing any good whatever. Quinine will not cure the intermittence of nervous diseases, though it may cure ague in which the symptoms are intermittent. Griesinger has also pointed out that mental disorder has sometimes occurred in the course of acute rheumatism, the swelling of the joints meanwhile subsiding. These facts, with others which I cannot dwell upon now, prove how important an agency in the production of insanity a perverted state of the blood may be. But it is a mode of causation of which we know so little that I may justly declare we know next to nothing. The observation and classification of mental disorders have been so exclusively psychological that we have not sincerely realized the fact that they illustrate the same pathological principles as other diseases, are produced in the same way, and must be investigated in the same spirit of positive research. Until this be done I see no hope of improvement in our knowledge of them, and no use in multiplying books about them.

It is quite true that when we have referred all the cases of insanity which we can to bodily causes, and grouped them according to their characteristic bodily and mental features, there will remain cases which we cannot refer to any recognizable bodily cause or connect with any definite bodily disease, and which we must be content to describe as *idiopathic*. The explanation of these cases we shall probably discover ultimately in the influence of the hereditary neurosis and in the peculiarities of individual temperament. It is evident that there are fundamental differences of temperament, and it is furthermore plain that different natures will be differently favored in the struggle of existence; one person will have an advantage over another, and by the operation of the law of Natural Selection there will be a success of the fittest to succeed. It is with the development of mind in the conduct of life as it is with every form of life in its relation to its environment. Life is surrounded by forces that are always tending to destroy it, and with which it may be represented as in a continued warfare: so long as it contends successfully with them, winning from them and constraining them to further its development, it flourishes; but when it can no longer strive, when they succeed in winning from it and increasing at its expense, it begins to decay and die. So it is with mind in the circumstances of its existence: the individual who cannot use circumstances, or accommodate himself successfully to them, and in the one way or the other make them further his development, is controlled and used by them; being weak, he must be miserable, must be a victim; and one way in which his suffering and failure will be manifest will be in insanity. Thus it is that mental trials which serve in the end to strengthen a strong nature break down a weak one which cannot fitly react, and that the efficiency of a moral cause of insanity betrays a conspiracy from within with the unfavorable outward circumstances.

It behooves us to bear distinctly in mind, when we take the moral causes of insanity into consideration, that the men-

tal suffering or psychical pain of a sad emotion testifies to actual wear and tear of nerve-element, to disintegration of some kind; it is the exponent of a *physical* change. What the change is we know not; but we may take it to be beyond question that, when a shock imparted to the mind through the senses causes a violent emotion, it produces a real commotion in the molecules of the brain. It is not that an intangible something flashes inward and mysteriously affects an intangible metaphysical entity; but that an impression made on the sense is conveyed along nervous paths of communication, and produces a definite physical effect in physically-constituted mind-centres; and that the mental effect, which is the exponent of the physical change, may be then transferred by molecular motion to the muscles, thus getting muscular expression, or to the processes of nutrition and secretion, getting expression in modifications of them. When there is a native infirmity or instability of nerve-element, in consequence of bad ancestral influences, the individual will be more liable to, and will suffer more from, such violent mental commotions; the disintegrating change in the nerve-element will be more likely to pass into a disorganization which rest and nutrition cannot repair, not otherwise than as happens with the elements of any other organ under like conditions of excessive stimulation. As physicians, we cannot afford to lose sight of the physical aspects of mental states, if we would truly comprehend the nature of mental disease, and learn to treat it with success. The metaphysician may, for the purposes of speculation, separate mind from body, and evoke the laws of its operation out of the depths of self-consciousness; but the physician—who has to deal practically with the thoughts, feelings, and conduct of men; who has to do with mind, not as an abstract entity concerning which he may be content to speculate, but as a force in Nature, the operations of which he must patiently observe and anxiously labor to influence—must recognize how entirely the integrity of the mental functions de-

pends on the integrity of the bodily organization—must acknowledge the essential unity of body and mind.

To set forth this unity has been a chief aim in these Lectures, because I entertain a most sincere conviction that a just conception of it must lie at the foundation of a real advance in our knowledge both of the physiology and pathology of mind. I have no wish whatever to exalt unduly the body; I have, if possible, still less desire to degrade the mind; but I do protest, with all the energy I dare use, against the unjust and most unscientific practice of declaring the body vile and despicable, of looking down upon the highest and most wonderful contrivance of creative skill as something of which man dare venture to feel ashamed. I cannot now summarize the facts and arguments which I have brought forward; I must trust to the indulgence of your memory of them when I declare that to my mind it appears a clear scientific duty to repudiate the quotation from an old writer, which the late Sir William Hamilton used to hang on the wall of his lecture-room:

> "On earth there is nothing great but man,
> In man there is nothing great but mind."

The aphorism, which, like most aphorisms, contains an equal measure of truth and untruth, is suitable enough to the pure metaphysician, but it is most unsuitable to the scientific inquirer, who is bound to reject it, not because of that which is not true in it only, but much more because of the baneful spirit with which it is inspired. On earth there are assuredly other things great besides man, though none greater; and in man there are other things great besides mind, though none greater. And whosoever, inspired by the spirit of the aphorism, thinks to know any thing truly of man without studying most earnestly the things on earth that lead up to man, or to know any thing truly of mind without studying most earnestly the things in the body that lead up to and issue in mind, will enter on a barren labor, which, if not a sorrow to

himself, will assuredly be sorrow and vexation of spirit to others. To reckon the highest operations of mind to be functions of a mental organization is to exalt, not to degrade, our conception of creative power and skill. For, if it be lawful and right to burst into admiration of the wonderful contrivance in Nature by which noble and beautiful products are formed out of base materials, it is surely much stronger evidence of contrivance to have developed the higher mental functions by evolution from the lower, and to have used forms of matter as the organic instruments of all. I know not why the Power which created matter and its properties should be thought not to have endowed it with the functions of reason, feeling, and will, seeing that, whether we discover it to be so endowed or not, the mystery is equally incomprehensible to us, equally simple and easy to the Power which created matter and its properties. To a right-thinking and right-feeling mind, the beauty, the grandeur, the mystery of Nature are augmented, not lessened, by each new glimpse into the secret recesses of her operations. The sun going forth from its chamber in the east to run its course is not less glorious in majesty because we have discovered the law of gravitation, and are able by spectral analysis to detect the metals which enter into its composition—because it is no longer Helios driving his golden chariot though the pathless spaces of the heavens. The mountains are not less imposing in their grandeur because the Oreads have deserted them, nor the groves less attractive, nor the streams more desolate, because science has banished the Dryads and the Naiads. No, science has not destroyed poetry, nor expelled the divine from Nature, but has furnished the materials, and given the presages, of a higher poetry and a mightier philosophy than the world has yet seen. The grave of each superstition which it slays is the womb of a better birth. And if it come to pass in its onward march—as it may well be it will come to pass—that other superstitions shall be dethroned as

the sun-god has been dethroned, we may rest assured that this also will be a step in human progress, and in the beneficent evolution of the Power which ruleth alike the courses of the stars and the ways of men.

CONSCIENCE AND ORGANIZATION.*

In beginning the work of this Section, over which I have the honor to preside, I shall confine myself to a few introductory remarks of a general character, leaving to those who will come after me the more exact scientific work of which we have fair promise in the papers that are to be read. The occasion seems fitting to take a short survey of the position of medical psychology in relation to certain important questions of the day, and to consider the bearing which its progress must eventually have upon them. Permit me, then, to ask you, first, to look back a little way at what medical psychology was, in order the better to realize what it is, and, if possible, to forecast something of the character of its future work. A glance at the past will show how great a step forward has been made, and may yield some reason for congratulation; a glance at the present, showing, as it cannot fail to do, how small a proportion the gains bear to what remains to be acquired, will prove that as yet we have rather discovered the right path than made much way on it; that we are, in truth, only on the threshold of the history of medical psychology as a science.

One of the saddest chapters in human history is that which describes the cruel manner in which the insane were treated in times past. Notwithstanding that it is happily a thing of the past, it will not be without profit to inquire from

* An Address on Medical Psychology, delivered at the Opening of the Psychological Section of the British Medical Association, 1872.

what causes the barbarous usage sprang: for it was not common to all nations and all times; on the contrary, it had its birth in the ignorance and superstition of the dark ages of Christian Europe. Whatever may have been thought of madness among the peoples who preceded the ancient Greeks —and there is evidence that the Egyptians adopted a singularly enlightened and humane treatment—it is certain that the Greeks had comparatively sound theories of the nature of insanity as a disease to be cured by medical and moral means, and adopted principles of treatment in conformity with those theories. Their dramatic poets, it is true, present terrible pictures of madmen pursued by the anger of the gods; but these were poetical representations, which must not be taken as a measure of the best knowledge of the time. Then, as now, and indeed as ever in the history of mankind, the true thinkers were emancipated from the fables and superstitions of the vulgar: the just measure of Greek intellect must be sought in the psychology of Plato, in the science of Aristotle, and in the medical doctrines of Hippocrates. This eminent physician and philosopher expressly repudiates the notion that one disease is of more divine origin than another. After saying that the Scythians ascribe the cause of certain disorders to God, he goes on to give his own opinion that these, and all other disorders, are neither more nor less of divine origin, and no one of them more divine or more human than another; that each has its own physical nature, and that none is produced without or apart from its nature. In what he says of the psychical symptoms of various diseases of the body he evinces such enlarged views of the scope of medical observation and practice as are not often evinced at the present day; and the few observations in his works respecting the symptoms of delirium "evidence that clear and correct view of disease which has made this first observer a model to all succeeding times." He directs attention to such facts of observation as the physical insensibility of the insane, the appearance of mental diseases in the spring, the occur-

rence of disorder of the intellect after a continuance of fear and grief, the union of melancholy and epilepsy, the critical importance of hæmorrhoidal discharges in mania, the difficulty of curing madness which commences after the age of forty, and the like. And as there was no superstition in these doctrines, so there was no barbarism in his treatment, which was medical, and consisted principally in evacuation by the use of hellebore. But moral treatment was not unknown among the Greeks; for Asclepiades, who seems to have been the real founder of a psychical mode of cure, made use of love, wine, music, employment, and special means, to attract the attention and exercise the memory. He recommended that bodily restraint should be avoided as much as possible, and that none but the most dangerous should be confined by bonds. Without going further into particulars, enough has been said to show that the Greeks had acquired accurate notions of madness as a disease, which was to be cured by appropriate and moral treatment.

How came it to pass that these enlightened views ever fell into oblivion? This question is really only a part of the larger question, How came it to pass that the high æsthetic culture and brilliant intellectual development of the Grecian era, which might have seemed possessions of mankind forever, were lost in the darkness and barbarism of the middle ages? To trace the causes of this so sad decline would be far beyond my present purpose; suffice the fact that philosophy, which had mounted so high, was for a time sunk so low beneath the waves of superstition and ignorance, that it might well have never been in existence. And, when atlast a revival of learning took place, things were little better; empty scholastic subtilties and metaphysical mysticism engaged the whole attention of men, who rivalled one another in verbal disputations, without agreement in the meaning of the terms they used, and in blind worship of the authority of Aristotle, without real regard to the trne method of his philosophy, or to the facts with which it dealt. As if knowledge

were nothing more than a process of ingenious excogitation, they made no attempt to observe the phenomena of Nature, and to search out the laws governing them, but laboriously "invoked their own spirits to utter oracles to them;" wherefore philosophy was little more than a web of unmeaning terms, and of empty metaphysical subtilties.

With this sort of intellectual activity was joined, as the result of the detestable spirit which inspired monastic teaching and monastic practice, a harsh religious asceticism, through which the body was looked down upon with contempt, as vile and despicable, the temple of Satan, the home of the fleshly lusts which war against the soul, and as needing to be vigilantly kept in subjection, to be crucified daily with its affections and lusts. It was the earthly prison-house of the spirit whose pure immortal longings were to get free from it. Such was the monstrous doctrine of the relation of mind and body. What place could a rational theory of insanity have in such an atmosphere of thought and feeling? The conception of it as a disease was impossible: it was ascribed to a supernatural operation, divine or diabolical, as the case might be—was a real possession of the individual by some extrinsic superior power. If the ravings of the person took a religious turn, and his life was a fanatical practice of some extraordinary penance—if, like St. Macarius, he slept for months together in a marsh, exposing his naked body to the stings of venomous flies; or, like St. Simeon Stylites, he spent the greater part of his life on a pillar sixty feet high; or, like St. Anthony, the patriarch of monachism, he had never, in extreme old age, been guilty of washing his feet—he was thought to have reached the ideal of human excellence, and was canonized as a saint. More often his state was deemed to be a possession by the devil or other evil spirit, or the degrading effect of a soul enslaved by sin. From some cause or other, he was a just victim of Divine displeasure, and had been cast down in consequence from his high human estate.

It was the natural result of such views of insanity that men should treat him whom they believed to have a devil in him, as they would have treated the devil could they have had the good fortune to lay hold of him. The tortures which the insane suffered from the devils that had entered into him were less than those inflicted by the devils who took charge of him. When he was not put to death as a heretic or a criminal, he was confined in a dungeon, where he lay chained on straw; his food was thrown in, and the straw raked out, through the bars; sightseers went to see him, as they went to see the wild beasts, for amusement; he was cowed by the whip, or other instrument of punishment, and was more neglected and worse treated than if he had been a wild beast. Many insane persons, too, were without doubt executed as witches, or as persons who had, through witchcraft, entered into compact with Satan. It is a striking illustration, if we think of it, of the condition of thought at that time, and of the great change which has taken place since, that such expressions as the black arts, witchcraft, diabolical possession, and the like, have fallen entirely out of use, and would be thought to convey no meaning if they were used now. They were fictitious causes invented to account for facts, many of which undoubtedly lay within the domain of madness.

Now, it is a fact, abundantly exemplified in human history, that a practice frequently lasts for a long time after the theory which inspired it has lost its hold on the belief of mankind. No wonder, then, that the cruel treatment of the insane survived the belief in diabolical possession, though it is justly a wonder that it should have lasted into this century. The explanation of the seeming anomaly is to be sought, I believe, in the purely metaphysical views of mind which prevailed long after inductive science had invaded and made conquests of other departments of Nature. Theology and metaphysics, having common interests, were naturally drawn into close alliance, in order to keep entire possession of the domain of mind, and to withstand the progress of in-

ductive inquiry. With the notions they cherished of the nature of mind, and of its relations to body, it was thought impossible, and would have been denounced as sacrilegious, to enter upon the study of it by the way of physical research. To have supposed that the innermost sanctuary of Nature could be so entered through the humble portals of bodily functions, would have been regarded as an unwarrantable and unholy exaltation of the body, which was full of all uncleanness, corruptible, of the earth earthy, and a gross degradation of the mind, which was incorruptible, of the heaven heavenly, and joint partaker of divine immortality. Whosoever had dared to propound such a doctrine would assuredly have been put to death as a blasphemer and a heretic. And yet he ought to have been hailed as a benefactor. It is impossible to say of any false belief which mankind have had, that it has been the most pernicious in its effects; but we may truly say of the theological notion of the relations of mind and body, that it has been surpassed by few false doctrines in the evil which it has worked.

The spirit of metaphysical speculation was scarcely less hostile to physical researches into mental function. For when inquirers had struggled successfully out of mere verbal disputation, and had applied themselves to the observation of mental phenomena, the method used was entirely one-sided; it was a system of mental introspection exclusively, each one looking into his own mind and propounding as philosophy what he thought he observed there; the external observation of mind in all its various manifestations, and of the bodily conditions of all mental action, was ignored. When all knowledge of mental action was gained in this way by observation of self-consciousness, men naturally formed opinions from their own experience which they applied to the mental states of insane persons; feeling that they themselves had a consciousness of right and wrong, and a power of will to do the right and forbear the wrong, they never doubted that madmen had a like clearness of consciousness and a like

power of will—that they could, if they would, control their disorderly thoughts and acts. The dungeon, the chain, the whip, and other instruments of punishment, were accordingly in constant use as means of coercion, the result being that exhibitions of madness were witnessed which are no longer to be seen, "because they were not the simple product of malady, but of malady aggravated by mismanagement." What with the theological notion of madness as a work of Satan in the individual, and what with the erroneous views of it subsequently begotten of the metaphysical spirit, it came to pass that the barbarous system of treatment was only abolished within the memory of men yet living. In sad truth may we say that, so far as a knowledge of the nature of insanity and of the proper mode of treating it is concerned, mankind owe no thanks, but, on the contrary, much error and infinite human suffering, to theology and metaphysics.

It was when men recognized insanity as a disease which, like other diseases, might be alleviated or cured by medical and moral means—when they regained the stand-point which the ancient Grecians had held—that they began the struggle to free themselves in this matter from the bondage of false theology and mischievous metaphysics. So far as the phenomena of deranged mind reach, the battle has been won and the victory is complete; no one whose opinion is of any value pretends now that they are any thing more than the deranged functions of the supreme nervous centres of the body. But the victory is not yet complete along the whole line of mental function; there is the strongest desire evinced, and the most strenuous efforts are made, in many quarters, to exempt from physical researches the highest functions of mind, and particularly the so-called moral sense and the will. The moral sense is, indeed, the stronghold of those who have made strategical movements of retreat from other defensive positions which they have taken up; and it is from this stronghold that what are deemed the most telling arguments against the Darwinian doctrine of physiological evolution

have come. Are we, then, as physiologists, to allow an exemption from physical research to any function of mind, however exalted; or shall we maintain through good and through evil report that all its functions, from the lowest to the highest, are equally functions of organization? A vital question for us as medical psychologists, which we must, sooner or later, face boldly, and answer distinctly.

In Abercrombie's well-known and valued work, "Inquiries concerning the Intellectual Powers," there is a striking passage relating to the moral sense which seems to me truly melancholy. After pointing out clearly the existence of a moral insanity in which every correct feeling is obliterated in regard to moral relations, while the judgment is sound in all other relations, and so demonstrating that the influence of the moral principle on the power of conscience may be weakened or lost, while reason remains unimpaired, he says: "That this power should so completely lose its sway, while reason remains unimpaired, is a point in the moral constitution of man which it does not belong to the physician to investigate. The fact is unquestionable; the solution is to be sought in the records of eternal truth." Is not this passage beyond measure sad? Must science really accept this attitude of helplessness? Must the physician who has to deal practically with these instances of moral insanity forbear forever to investigate its nature and causation? So far from assenting to such an exclusion, I hold that there is no *sanctum sanctorum* in science, and that it distinctly belongs to the physician to seek for the solution of the problem in the discovery of those laws of Nature which are to him the incontestable records of eternal truth.

Let us clearly apprehend the problem which we have to consider. Some popular capital has been made, and made in quarters where we might justly have looked for greater sincerity or sounder apprehension, out of the fact that physiology, however far it may advance, can never bridge over the gap between nerve-elements and mind, can never leap

from the movements of nerve-molecules to consciousness. No one has ever said that it could; the problem before us as scientific observers is not to demonstrate the real nature of the force which we designate mental, nor to show how and why certain molecular movements in nerve become, if they do become, sensation or idea, but it is to trace here, as in other departments of Nature, uniformities of sequence; to point out that certain sequences are, within our experience, the invariable consequences of certain antecedent conditions. The *how* or the *why* is a mystery which we do not pretend or attempt to explain; we do not even aspire to know it. We can only know these uniformities of sequence as we do the uniformity of sequence which we call gravitation. What is the actual power which makes one body attract another directly as the mass and inversely as the square of the distance, we have not the least knowledge; why and how certain molecular movements become heat, or electricity, or chemical action, we are just as ignorant; and in admitting that we cannot comprehend how certain states of matter occasion certain states of mind, we may rightly demand that no more should be asked of the physiologist, in explanation of the *why* of events, than is asked of the physicist. The mystery is neither more nor less in the one case than in the other. To say that it is inconceivable that matter, in however complex a state of organization, should generate consciousness, should feel and think, is simply an appeal to the self-sufficiency of human intellect at the present day, and a sort of argument which, if logically carried through, would bar any new conception of what, from ignorance, is yet inconceivable to us; it would make the present limit of conception the limit of conception forever; and it is certainly unwarrantable in the face of the fact that the history of the progress of knowledge is, in great part, a history of the inconceivable becoming conceivable. Moreover, it is an assertion which is positively contradicted by the testimony of persons who have been presumably in their right minds, and who have not spoken

in mere haste and ignorance. Let me instance that of one person, whose qualifications few will contest—I mean John Milton. Both in prose and poetry he makes known his opinion that matter is capable of intellectual functions, declaring in "Paradise Lost," that the first matter rises through various degrees of substance and of life, until "body up to spirit works," just as from the root springs lighter the green stalk, from thence the leaves, and, "last, the bright consummate flower spirits odorous breathes." That he intended this passage not merely as poetry, but as sound philosophy, is proved by what he says in his "Treatise on Christian Doctrine," where he declares that "man is a living being, intrinsically and properly one and individual, not compound or separable, not, according to the common opinion, made up and framed of two distinct and different natures, as of soul and body—but the whole man is soul, and the soul man; that is to say, a body, or substance, individual, animated, sensitive, and rational." The notion of matter being capable of thinking was clearly, then, not inconceivable to Milton; and there can be no doubt that there always have been persons who have found it more conceivable than the notion of spirit entirely distinct from body, having no relation to it, and yet acting upon it in every thought, feeling, and act of life.*

* Some of those who have done me the honor to criticise this address, have seemed to think that in saying that Milton held matter to be capable of intellectual function, I have not fairly represented his opinion. Let me add, therefore, the following quotations from his "Treatise on Christian Doctrine:" "For the original matter of which we speak is not to be looked upon as an evil or a trivial thing, but as intrinsically good, and the chief productive stock of every subsequent good. . . . But that the spirit of man should be *separate* from the body, so as to have a perfect and intelligent existence independently of it, is nowhere said in Scripture, and the doctrine is evidently at variance both with Nature and reason, as will be shown more fully hereafter. For the word soul is also applied to every kind of living being: Gen. i. 30, 'to every beast of the earth,' etc., 'wherein there is life;' vii. 22, 'all in whose nostrils was the breath of life, of all that was in the dry land, died;' yet it was never inferred from these expressions that the soul exists separate from the body in any of the brute creation. . . . It would seem, therefore, that the human soul is not created daily by the immediate act of God, but propagated from father to son in a natural order. . . . There seems, therefore, no reason why the soul of man should be made an exception to

With these general remarks, by way of necessary caution, let me come to the particular problem which we have to face—namely, whether there is the same essential connection between moral sense and brain which there is between thought and brain, or between any of our special senses and its special ganglionic centre in the brain? Is conscience a function of organization? I will ask you to look without prejudice at the facts of observation, and to consider if they admit of any other scientific interpretation. For the medical psychologist, whose duty brings him into constant intercourse with facts, cannot rest satisfied with vague speculations; he is bound to investigate the phenomena as they present themselves to observation, and to form conclusions from them, without regard to accepted theories of faith or knowledge; and if he arrives at sound conclusions from such observation of facts not before observed, these will not contradict old faiths unless in that wherein old faiths are wrong, and it is right they should be contradicted. His generalizations, like the generalizations of astronomy, chemistry, or any other branch of science, must rest on their own merits; they cannot justly be tested by any preconceived standard of truth, however much hallowed by antiquity or sanctioned by authority.

When we come to deal with examples of moral degeneracy, whether among the insane or among criminals, we perceive at once that it is not sufficient to ascribe immorality to the devil; that we must, if we would not leave the matter a mystery, go on to discover the cause of it in the individual. The effect defective comes by cause, we are constrained to believe; what is the cause and what are the laws of moral degeneracy? As society is constituted, certain

the general law of creation. For, as has been shown before, God breathed the breath of life into other living beings, and blended it so intimately with matter, that the propagation and production of the human form were analogous to those of other forms, and were the proper effects of that power which had been communicated to matter by the Deity."

See also "Paradise Lost," book v., v. 100 and v. 407.

forms of evil-doing. are certainly not profitable in the long-run; how comes it, then, that an individual, capable of looking before and after, remembering the retribution of past sin, and foreseeing the Nemesis that waits on future wrong-doing, is so forgetful of true self-interest as to yield to evil impulses? And whence do these impulses come? One thing is certain, that moral philosophy cannot penetrate the hidden springs of feeling and impulse; they lie deeper than it can reach, for they lie in the physical constitution of the individual, and, going still farther back, perhaps in his organic antecedents. Because the fathers have eaten sour grapes, therefore it often is that the children's teeth are set on edge. Because the fathers had stoned the prophets, therefore it was that the children rejected Him who was sent unto them. Assuredly of some criminals, as of some insane persons, it may be truly said that they are born, not made; they go criminal, as the insane go mad, because they cannot help it; a stronger power than they can counteract has given the bias of their being. Those who doubt this when it is put in this positive form, will hardly continue to do so when they consider that between the drivelling idiot, equally destitute of intellect and moral feeling, whom no labor of training can raise to a human level, and the highest example of intellect and moral feeling, there are beings marking every step of the long gradation; that we may mount from entire absence of moral sense through every grade of deficiency up to its highest state of development. I do not dispute that much may sometimes be done by education and training to counteract in this respect the ills of a bad inheritance, but it is still true that the foundations upon which the acquisitions of education must rest are inherited, and that in many instances they are too weak to bear a good moral superstructure. Moral philosophy may make its hard and fast lines, and lay down abstract propositions concerning the power of the will in the conduct of life; but, when we have to do with concrete cases, it is plain that no such definite lines can be

applied, and that the abstract propositions are only true of a certain proportion of mankind. Moreover, it appears also that those of whom they are true have much less merit in the matter, and those of whom they are not true much less blame, than moral philosophers are apt to imagine and inculcate. The fact of inheritance which constitutes the misfortune of the latter constitutes also the virtue of the former. There is often *nulla imputatio* in one case, *nulla virtus* in the other.

The causes, course, and varieties of degeneracy are not, then, merely subjects for the moral philosopher or the preacher; but they are proper subjects for positive scientific inquiry. And if they be so investigated, it is not unlikely that the results may throw some light on the vexed question of the nature and origin of the moral sense. Now, if there be a class of persons who are without the moral sense, who are true moral imbeciles, it is the class of habitual criminals. All observers who have made them their study agree that they constitute a morbid or degenerate variety of mankind, marked by peculiar low physical and mental characteristics. They are scrofulous, often deformed, with badly-formed, angular heads, are stupid, sluggish, deficient in vital energy, and sometimes afflicted with epilepsy. They are of weak and defective intellect, though excessively cunning; and not a few of them are weak-minded and imbecile. The women are ugly in features, and without grace of expression or movement. The children who become juvenile criminals, do not evince the educational aptitude of the higher industrial classes; they are deficient in the power of attention and application, have bad memories, and make slow progress in learning; many of them are weak in mind and body, and some of them actually imbecile. At the end of the best part of a life spent among prisoners, a prison-surgeon declares himself to be mainly impressed with their extreme deficiency or perversion of moral feeling, the strength of the evil propensities of their nature, and their utter impracticability; neither kindness nor severity availing to prevent them from

devising and doing wrong day by day, although their conduct brought on them further privations. Their evil propensities are veritable instincts of their defective nature, acting, like instincts, in spite of reason, and producing, when not gratified, a restlessness which becomes at times uncontrollable. Hence occur the so-called "breakings-out" of prisoners, when, without apparent cause, they fall into paroxysms of excitement, tear their clothing and bedding, assault the officers, and altogether behave for a time like furious madmen.

We may take it, then, on the authority of those who have had the best opportunities of observation, that there is a class of criminals formed of beings of defective physical and mental organization; one result of the defect, which really determines their destiny in life, being an extreme deficiency or complete absence of moral sense: that an absence of moral sense may be a congenital vice or fault of organization. The experience of medical practice certainly confirms this view. From time to time we are consulted about perplexing cases of what might be called moral insanity, or, more properly, moral imbecility, in children of the better classes. Though born in good circumstances of life, and having every advantage of education, they cannot, by any care or training, be made to learn and behave like other children; they display no affection whatever for parents, brothers, or sisters, and no real appreciation of the difference between right and wrong —no love for the one, no remorse for the other; they are inherently vicious, and steal and lie with a skill that it is hard to believe could ever have been acquired—are, in fact, instinctive thieves and liars; every thing that their vicious nature prompts them to desire is for them right, and they exhibit a remarkable cunning in gratifying their evil propensities; they are the hopeless pupils of any master who has any thing to do with them, and are sure to be expelled from any school to which they may be sent. In the end, all those who have to do with them are constrained to ascribe to defect what at first seemed simple badness. Now, what we commonly find

in these cases, when we are able to push satisfactory inquiry into their hereditary antecedents, is that they come of families in which insanity or some allied neurosis prevails. This is the interesting fact to which I wish to draw attention.

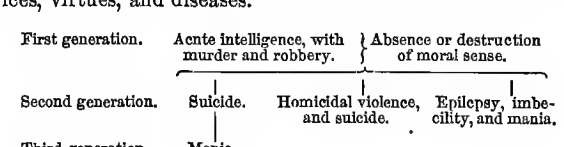
In addition to the entire absence or perversion of moral sense, without feeling of remorse, which experience of habitual criminals brings prominently out, other important facts which we learn from an investigation of their family histories are, that a considerable proportion of them are weak-minded or epileptic, or become insane, or that they spring from families in which insanity, epilepsy, or some other neurosis exists, and that the diseases from which they suffer, and of which they die, are chiefly tubercular diseases, and diseases of the nervous system. Crime is not, then, always a simple affair of yielding to an evil impulse or a vicious passion, which might be checked were ordinary control exercised; it is clearly sometimes the result of an actual neurosis which has close relations of nature and descent to other neuroses; especially the epileptic and the insane neuroses; and this neurosis is the physical result of physiological laws of production and evolution. No wonder that the criminal *psychosis*, which is the mental side of the *neurosis*, is for the most part an intractable malady; punishment being of no avail to produce a permanent reformation. A true reformation would be a *re*-forming of the individual nature; and how can that which has been forming through generations be *re*-formed within the term of a single life? Can the Ethiopian change his skin, or the leopard his spots?

The hereditary kinship which is sometimes traceable between crime and insanity, I cannot now set forth in detail; but, to make clear what I mean, I may give one or two illustrations out of many of a like kind, which might be brought forward. Of five children from an insane mother and a drunken father, one was suicidal, two suffered imprisonment for crimes, one daughter was insane, the other was imbecile. Suicide, crime, insanity, and imbecility, were thus different

manifestations of a morbid type in the second generation. The case of Christiana Edmunds, who was convicted of murder, and afterward reprieved and sent to Broadmoor, will be fresh in your recollection. Her father died raving mad in an asylum; her brother died epileptic and idiotic at Earlswood; her sister suffered from mental excitement, and once attempted to throw herself out of a window; her mother's father died paralyzed and childish; a cousin on the same side was imbecile; she herself had been subject to somnambulism in childhood, had suffered from hysteria later in life, and had finally had an attack of hemiplegia; and at the time of her trial, her face, drawn to one side, showed the effects of the hemiplegic attack from which she had suffered. I had more than an hour's conversation with her in Newgate, and, at the end of it, two convictions were firmly planted in my mind: the first, that she had no real moral appreciation of the nature of her crime, and no shadow of a feeling of remorse with regard to it; the second, that she would have poisoned a whole city-full of people, if it had lain in her way to do so, without hesitation, compunction, or remorse. Nevertheless, her intellect was acute, certainly above the average, and showed no signs of disorder. I could only regard her case as a strong confirmation of an opinion which I had elsewhere expressed, and which I believe to be a just conclusion from facts; namely, that one occasional result of descent from an insane family is a nature entirely destitute of moral sense—congenitally defective in that respect—whereby the individual is as insensible to the moral relations of life as a person color-blind is to certain colors. I give no opinion here as to the legal policy of treating such a person as of sound and responsible nature; it is a subject beset with difficulties, and many considerations, on which I cannot enter now, would have to be taken into account; but I may justly ask you, as scientific men, whether you would pronounce a person, with such hereditary antecedents and such personal ills, accountable in the same sense or same degree as one of us? For my part, when

one thinks of the terrible affliction which an unsound mental organization is, and what reason for devout thankfulness a man of sound descent and nature has, I would rather pray with the Arabian philosopher, "O God! be kind to the wicked; to the good thou hast already been sufficiently kind in making them good."

One example more shall suffice to exhibit the alliance between degenerate types; it shows the effect of crime in one generation of a family upon the mental organization of the following generations—shows, indeed, how the sins of the fathers are visited upon the children unto the third and fourth generations. It is that of the innkeeper, which I have quoted on other occasions: While the Reign of Terror was going on during the first French Revolution, he profited by the critical situation in which many nobles of his commune found themselves, to decoy them into his house, where he was believed to have robbed and murdered them. His daughter, having quarrelled with him, denounced him to the authorities, who put him on his trial, but he escaped conviction from lack of proof. She committed suicide subsequently. One of her brothers had nearly murdered her on one occasion with a knife, and another brother hanged himself. Her sister was epileptic, imbecile, and paroxysmally violent. Her daughter, in whom the degenerate line approached extinction, became completely deranged, and was sent to an asylum. Here, then, is the sort of pedigree which we really want, if we are to judge of the worth of a family—the hereditary line of its vices, virtues, and diseases.



It may be said that this was an extreme and exceptional case. Without doubt it was an extreme case; but it is on

that account the better fitted to produce an impression; and it must be remembered that the laws by which its results were worked out are laws which are continually at work in accomplishing less striking results, and that so-called exceptional cases in science are, when rightly studied, exceptionally useful in helping us to discover the laws for which we are searching. My argument is, that the moral element is an essential part of a complete and sound character, in the present state of human evolution; it was the last acquisition of development in the progress of *humanization*, and it is commonly the first to suffer when degeneracy begins, and therefore its decay is the first sign of the commencement of such degeneracy. He who is destitute of moral sense is a defective being to that extent; he marks the beginning of race-degeneracy; and, if better influences do not intervene to check or neutralize the morbid tendency, his children will exhibit a further degree of degeneracy, and be actual morbid varieties. What shall be the particular outcome of the morbid strain—whether vice, or crime, or madness—will of course depend much on the circumstances of life; the inborn fact counts for much, but not for every thing, in the result. Certainly, however, it is a conviction in my mind, produced by observation of instances, that one way in which insanity seems to be generated *de novo* in a family, is through the deterioration of nature induced by destruction of moral sense. As insanity in one generation may produce an absence of moral sense in the next, so, conversely, absence or destruction of the moral sense in one generation may be followed by insanity in the next.

No one who has had much to do with the treatment of the insane can have failed to notice the mental peculiarities sometimes exhibited by their near relations. One striking way in which they display them at times is in an extreme morbid suspicion of every thing and everybody; in the most innocent actions of others they detect an unworthy motive, and seize on the evil interpretation. They torment them-

selves and others with the ingenuity of their suspicions. Secret ways and dealings they affect naturally and pursue systematically. However insane their relative may be, they can hardly be brought to see it; and, if they do see it, they seem actually to persuade themselves that the doctors who have treated him, or those who have had the care of him, are responsible for his state. These moral peculiarities are constitutional: they are marks of one variety of the insane temperament, and, as such, are of interest to us in our present inquiry. For the facts which I have thus far mentioned seem to me to prove the essential connection of the moral sense with organization, and to admit of interpretation only on that supposition. It, or the potentiality of it, is inherited by most persons, though some appear to be born without it; it is developed by culture; decays from disuse; and is perverted or destroyed by disease. The last acquired faculty in the progress of human evolution, it is the first to suffer when disease invades the mental organization. One of the first symptoms of insanity—one which declares itself before there is any intellectual derangement, before the person's friends suspect even that he is becoming insane—is a deadening or complete perversion of the moral sense. In extreme cases it is observed that the modest man becomes presumptuous and exacting, the chaste man lewd and obscene, the honest man a thief, and the truthful man an unblushing liar. Short of this, however, there is an observable impairment of the finer moral feelings—a something different, which the nearest friends do not fail to feel, although they cannot always describe it. Now, these signs of moral perversion are really the first symptoms of a mental derangement which may, in its further course, go through all degrees of intellectual disorder, and end in destruction of mind, with visible destruction of the nerve-cells which minister to mind. Is the end, then, dependent on organization, or rather disorganization, and is the beginning not? This course of degeneracy is but a summary in the individual of what we have already seen to take place

through generations, and in both cases we are constrained to believe that the moral changes are as closely dependent upon physical causes as are the intellectual changes which accompany or follow them. If it be not so, we may bid farewell to all investigation of mental function by a scientific method.

Other arguments in favor of this view of conscience as a function of organization — the highest and most delicate function of the highest and most complex development thereof—might be drawn from the effect of a severe attack of insanity on the moral feelings. The patient entirely recovers his reason; his intellectual faculties are as acute as ever, but his moral character is changed; he is no longer the moral man that he was; the shock has destroyed the finest part of his mental organization. Henceforth his life may be as different from his former life as was the life of Saul of Tarsus from the life of Paul the Apostle to the Gentiles. An attack of epilepsy has produced the same effect, effacing the moral sense as it effaces the memory sometimes; and we are all familiar with the marked temporary change of moral character in the epileptic which often precedes and heralds the approach of his fits. A fever, or an injury to the head, has in like manner entirely changed the moral character, and so also has habitual opium-eating or habitual drunkenness. The evil effect of these vices might of course be ascribed to the indulgence of passion and the degradation of the moral sense apart from physical causes; but the same cannot be said of the effects of a fever or of an injury to the head. Moreover, we know that alcohol and opium do affect the brain by their actual presence there, and through the brain the mind, just as strychnia affects the spinal cord and its functions; and we know also that it is in the natural order of events that continuance of perverted function should lead to organic disease. In the case of opium or alcohol, then, as in the case of a blow on the head, we believe the effect to be physical.

We are further strengthened in this conviction when we

take note of the decided effects of solitary vice upon the moral character, or of such a sexual mutilation as eunuchs have undergone. Long before that vice destroys the mind, it destroys moral energy and feeling, this effect being the precursor of the intellectual impairment which goes on to utter dementia in the worst cases. Of the moral character of eunuchs, all that we can briefly say is, that in most cases they have no moral character; their minds are mutilated like their bodies; with the deprivation of sexual feeling, they are deprived of all the mental growth and energy which it directly or remotely inspires. How much this is, it would be hard to say; but were man deprived of the instinct of propagation, and of all that mentally springs from it, I doubt not that most of the poetry and perhaps all the moral feeling would be cut out of his life.

Before such an audience, it is not necessary for me to insist further on such facts as I have mentioned; as physicians we cannot fail to recognize them; but it is necessary for us, if we would be, like our great master Hippocrates, philosophers as well as physicians, to give them their proper place in a system of medical psychology, and to weigh their bearing on accepted philosophical theories. I had meant to point out how they go to prove the doctrine of evolution to be true of the highest mental faculties of man, including his moral sense; but I must refrain. Already I have trespassed too long on your patience. The medical psychologist must, I think, maintain that the best of the argument concerning the origin of the moral sense is with those who uphold its acquired nature. That the sentiments of common interest in the primitive family and tribe, and the habitual reprobation of certain acts by individuals as injurious to the family or tribe, should finally generate a sentiment of right and wrong in regard to such acts, and that such sentiment should in the course of generations be transmitted by hereditary action as a more or less marked instinctive feeling, is in entire accordance with what we know of the results of education and of

hereditary action. Time was, we know, when men wandered about the country in families or tribes. In order that they might rise from this nomadic state to a national existence, the acquisition and development of a moral sense must clearly have been essential conditions—not, however, as preformed agents, but as concomitant effects of evolution. This development is still going slowly on; but the proof how little moral sense itself instigates progress is seen in the absence of it between nations. Men have risen to a national existence, but they have not yet risen to an international existence. With moral principles that have not changed within historical times, nations still laud patriotism, which is actually a mark of moral incompleteness, as the highest virtue; and statesmen think it a fine thing to sneer at cosmopolitanism. But it cannot be doubted that the time will come, though it may be yet afar off, when nations shall know and feel their interests to be one, when moral feeling shall be developed between them, and when they shall not learn war any more; it will come as a step in evolution and as a condition of universal brotherhood, not otherwise than as, coming between tribes, it bound them into nations, and made patriotism the high virtue which it is believed to be.

In the work of helping to trace the path of human evolution through the ages, a great function lies before a scientific psychology; and in investigating in one department thereof the characters of the various neuroses, and the causes, course, and varieties of human degeneracy, which seem to be necessary retrograde accompaniments of progress, we medical psychologists have a vast field before us. To rise to a just conception of the scope and dignity of our work will be the best inspiration for entering on it, as is becoming, neither in an abject spirit of superstition nor in an arrogant spirit of conceit. For this we must not forget; that, however clearly we trace the order of events, the mystery of their *why* remains where it was; however clearly we may follow "one first matter" through

> " various forms, and various degrees
> Of substance, and in things that live, of life,
> . . . . . .
> Till body up to spirit work, in bounds
> Proportioned to each kind,"

the power which determines why one tissue should supervene on another, why life should tend upward, which inspires and guides the everlasting becoming of things, must ever remain past finding out. Man himself, with all his sorrows and sufferings, with all his hopes and aspirations, and his labors wherewith he has labored under the sun, it is but a little incident in the inconceivably vast operations of that primal central power which sent the planets on their courses, and holds the lasting orbs of heaven in their just poise and movement.

PART II.

ESSAYS.

HAMLET.*

Much as has been written concerning "Hamlet" by the many who have sympathized with the different phases of his character, yet it would appear that no one who sets himself anew to the earnest study of the drama, is content with what others have done, but believes that he can add something important from his own reflections. Were confession honestly made, it would most likely turn out that each sympathetic reader did at bottom consider himself to be the real Hamlet; no marvel, therefore, that he deems himself best capable of doing justice to the character. Though he fail to give an adequate idea of the Hamlet which Shakespeare created, each critic does unquestionably succeed in revealing his own intellectual range, and the sort of one-sided Hamlet which he would have created. Many of these criticisms or expositions would, however, have been rendered unnecessary if their authors had but borne it in mind that Hamlet is a poetical creation, and never was a living reality. Certainly, had that been done, it is not likely that any one would have deliberately set himself to prove that he was an actual madman. Heartily sympathizing with him in his perilous perplexities, some are yet needlessly pained by the horrible sentiments to which he gives utterance, and offended by the apparent brutality of his conduct; eager for the moral credit of the hero, they strive to exculpate him, even at the cost of finding "no other excuse but the sad excuse of a disordered mind." Such

* Westminster Review, No 53:—1. Shakespeare. Von G. G. Gervinus. Dritte Auflage. 2. A Study of Hamlet. By John Conolly, M. D., D. C. L.

view proceeds from a misconception of the nature and aim of the drama.

In tragedy, it is always necessary that the character of the hero be neither purely good nor purely bad; else there would not be sufficient complication of exciting events. Were the hero purely good, while the circumstances in which he was placed were adverse, then, though we might have the suffering life of a martyr or a saint well adapted to excite our commiseration, we certainly should not have the dramatic action of a tragedy that would actively move our feelings and powerfully stir our sympathy; in the first act would be included all the rest of the tragedy. The character must not indeed be that of an angel, but that of a man compounded, like other men, of virtues and faults, who struggles with a brave defiance against the most adverse circumstances, and, notwithstanding praiseworthy and strenuous efforts, at last sinks perhaps beneath the bad fate of some defect in his own character. He is an Atlas supporting the world, but in the end is buried under it. Out of the relations of his nature to its surroundings, an unavoidable destiny is forged, and he is hurried on in spite of all his struggles through a malign conjunction of events to an unforeseen catastrophe. As in Grecian fable, the efforts which the victim made to avoid the doom foretold him by the oracle, were exactly such as conducted him unwitting to the foreordained catastrophe, so in the drama, the fate which the hero's character makes for him often renders vain all the energy with which he moves hinderances out of his way, and battles with opposing events. "Tragical destiny," says Jean Paul, "is the long-reverberating mountain echo of a human discord."

A second reflection which might well have wrought to prevent any attempt at an exact portrait of Hamlet as a living individual, is a reflection on the form or nature of a true dramatic character. It is an allegorical or symbolical individuality, not merely a particular portrait; the secret of its appeal to universal sympathy being that the general is manifest

in the concrete, humanity mirrored in the individual. Were the poet to present to us the exact copy of an individual character, however marked might be its peculiarities, it would still have very little interest for us and would very soon be forgotten: in his blindness and incompetency, he would sacrifice the permanent and universal to the fleeting and accidental. And this is assuredly a great mistake; for every individual is representative—more or less plainly, an incarnation of the universal; in each one is latent all that is human. Hence it is that the great poet, penetrating into the depths of the individual nature, and grasping the universal or essential, is able to create so many characters; and hence also it is that we are able, from the appeal which they make to our common humanity, at once to recognize them, though we have never met with the originals in real life. It is the characteristic of the genius that he can seize the vague, formless feelings, and the indistinct casual thoughts, that lie deep and latent in our unconscious life, and bring them forth into clearness and distinction; by flashing a light upon that which lay in obscurity he thus makes a new revelation of Nature, and in his creation we learn to know ourselves. Because every animal too has its footing in our nature, it is possible for the genius of a Landseer to render the common relation visible through the creations of his art, and to appeal powerfully to our sympathies. A true dramatic character that shall live must be representative or symbolical, never a mere portrait: the story of Prometheus, is it not a universal verity? Had Shakespeare been content to copy individual nature, no one would have been at the trouble now to remember Hamlet or Falstaff; and that so many writers have given us characters which are no more than particular portraits, is a sufficient reason why scarce one organic character was added to our possessions from the time of Shakespeare unto that of Goethe.

It is truly, then, a painful shock to poetical sensibility, when any attempt is made to reduce the universality manifest to our reason through the well-marked individuality of Ham-

let's character to a mere portrait with which the senses only are concerned. Hamlet is not the photographic copy of any real character, but the idealized realization of human nature under certain conditions: it is an ideal of human nature strongly individualized, the character being, therefore, consistent with human nature as a generic expression, and consistent with itself as a personality. Consequently it is the highest art, not a mere imitation or reproduction such as inferior art is: it is Nature developed through man, and that man Shakespeare. Those, therefore, who reflect will see in Hamlet, as they do in contemplating Nature, that which they bring with them, the faculty of seeing. One man, pluming himself, it may be, on being practical, sees no more than the plain facts, and discovers with exultant littleness the anachronism of Ophelia's calling for a coach; another thrills in harmonious symphony with the poetry in the drama, and follows with feelings of tender sympathy the fate of the hapless Ophelia; while a third recognizes the philosophy of the play, and traces with admiring awe the relentless course of destiny in the evolution of events. As long as human nature remains what it is, all classes in all ages will find a reflection of some part of themselves in Hamlet. Is it not, then, a much mistaken labor in any one to strive to point out how minutely Shakespeare has here copied Nature? The right aim of a critic who is conscious of the exalted scope of art, must be to show how he has developed Nature, to unfold the idea which inspires and pervades the wondrous drama. Surely there is abundant evidence that Shakespeare, with deliberate purpose, disdains minutely to reproduce Nature, just as he distains chronologies, unities, and such transitory things; so that, to the mere observer, nothing can be more unnatural than some of his scenes. But he does not appeal to the senses and to one age; he appeals to the reason and to all time. While he lived he was himself the highest development of Nature; and his sincere works, his art, must therefore be true to Nature, true to the eternal indwelling ideas—

the universal verities, though not including the fleeting, temporary, and accidental. Genius has but little concern with the moment; the "eternities are its seed-field."

In the first act of "Hamlet," the key-note of the tragedy is struck. There is not, it is true, any prediction of the course which events are to take; but the tone of mind produced by the scene is a solemn feeling of mysterious awe, which vibrates in the soul like the wail of mournful music, and contains the formless presentiment of coming woes; it is a heavy but undefined oppression, like that dead stillness or indistinct moaning of physical Nature which sometimes on a summer's day precedes the outburst of a violent storm. This feeling is in excellent harmony with the external circumstances of the scene—the bitter cold night when there is not a mouse stirring, the sentinel on the lonely platform sick at heart, and the bell just beating one: the external physical world and the internal world of feeling are brought face to face as strophe and antistrophe. And as this depressing scene presages the appearance of the ghost, as this melancholy of physical Nature foreshadows the event of her troubled spirit, so the gloomy presentiment which rests in the mind at the close of the act portends the coming horrors: the dark shadow of predestination is cast over both. When we consciously strive to interpret the oppressive feeling, it becomes evident that we have a vague instinct that Fate is imposing on an individual a task which must hurry him to destruction—that here once more is to be acted the old and unequal contest of human will with necessity, the tragedy at which the gods do laugh. What shall human prudence avail when a supernatural messenger from realms not dreamed of in human philosophy issues the fiat of destiny? Well may Hamlet exclaim when the ghost appears, and his friends endeavor to prevent him from obeying its beckonings:

> "*My fate cries out,*
> And makes each petty artery in this body
> As hardy as the Nemean lion's nerve.
> *Still am I called.*"

After the ghost has made its horrible revelations, and the tension of Hamlet's great emotion has relaxed, how infinitely insignificant, how intolerably little, would appear the petty matters of ordinary life! No wonder that he flashes out in "wild and whirling words" of scorn and sarcasm—words which are the fit expressions of a deep agitation, which represent in their wildness that strange, hoarse tone of voice, and that recklessness of thought, that follow the shock of a powerful emotion. Hamlet was inclined by nature, too, to be satirical, as a person of his power of insight, his acuteness of understanding, must almost of necessity be; and the genuine character is revealed when all external considerations are swept away by the fierce internal storm. What, again, could appear to his seriously moved mind more unfitting the terrible gravity of the occasion than the vulgar curiosity of Horatio and Marcellus? To one who is profoundly and solely affected by some huge and painful sorrow, it is positively afflicting when indifferent spectators come forward with eager curiosity, complacent commentary, or superficial sympathy. However friendly the intention, their stand-point is so far removed from that of the sufferer, that there can be no real community of thought or feeling: to the lost souls in hell it were scarce any alleviation of their unutterable woe to know that the angelic hosts of heaven grieve for their sufferings. Feeling the character of their eager curiosity, Hamlet prudently does not trust his friends on the instant with the knowledge of what might excite their chattering wonder. No; the ghost had not spoken to them; it had selected him: from him the tormented spirit demanded revenge and rest; on him, the son of a murdered father, was imposed the task of avenging his royal father; in circumstances of unparalleled difficulty he must trust only to his own right hand. This, then, becomes clear, that he must secure secrecy and time for reflection; and so, leaving the wild and whirling words in which his overladen nature had taken instinctive refuge from the tension of great passion, he seriously begs his friends to over-

master as they may their desire to learn what the ghost has said, and swears them never to make known what they have seen:

> "And what so poor a man as Hamlet is
> May do, to express his love and friending to you,
> God willing, shall not lack. Let us go in together;
> And still your fingers on your lips, I pray.
> The time is out of joint;—O cursed spite,
> That ever I was born to set it right!"

It is these last words that are so exceeding melancholy; they contain, as Goethe said, the key to Hamlet's whole behavior. Are they not tremulous also with the forebodings of failure? They prove, at any rate, that Hamlet was conscious that his life must henceforth be a sacrifice to the great deed which had been imposed upon him as a duty. Fate had ordained him to it; and yet the fate which his character was, rendered him unequal to it. "O cursed spite!"

The life of man is the definite result of fixed relations between the individual and circumstances; and the events of its evolution take place in accordance with laws which, though little known—almost, indeed, unknown—are yet as certain as those which govern the motions of planets in their orbits. In the pathless immensity of the heavens these cannot miss their way; and how little must be his insight who can think that man passes unguided through space and time! But because the multiplicity of elements and the complexity of conditions are so great, it is quite impossible to determine the relations of human events, and to predict their occurrence. This, however, is clear—that the greatest is he who determines as much as possible circumstances, and is as little as possible determined by them. Gratifying and instructive is the spectacle of an heroic man with a definite aim before him, pressing forward with steadfast perseverance toward it; putting aside one hinderance after another; wisely adapting himself to what cannot be prevented; and ultimately attaining to the goal which he had set himself. Such a one does not make tragedy of his life; for, if circumstances are too

strong for him, he accommodates himself to circumstances, and in the end conquers by obeying: he has a definite aim before him, and works definitely for it. Having possessed his soul in patience, he can endure whatever may betide: "It is the same to him who wears a shoe as if the whole world were covered with leather." When a man, however, goes on aimlessly or carelessly ravelling the threads of his life, he has no right to be surprised if the character of the web is determined for him. Such a one is liable to become the victim of circumstances, and, sorely pressed by them, he groans under the cruel harshness of Fate, and pours out unavailing wails to an indifferent Heaven.

Tragedy is man driven to destruction by circumstances. The nobler the sufferer's aim, the more constant his fortitude, the more violent his struggles, the intenser his agonies—the greater is the tragedy. Nothing can surpass in grandeur of conception that type of all tragedy—Prometheus bound with adamantine chains to the bleak rock against which the pitiless waves of the earth-encircling ocean in unvarying monotony dashed, and—a victim of unspeakable suffering and of cruel injustice at the hands of the might-possessing, right-spurning tyrant of Olympus—lamenting in bitter anguish of his soul that such should be the reward of philanthropic labor:

τοίαντα ἀπηύρω τοῦ φιλανθρώπου τρόπου.

How mournful yet how grandly impressive the representation of his wailing appeal to the waves of the ocean in their multitudinous laughter! Whosoever would complain might do well to think of Nature's indifference, to call to mind the wild wail of Prometheus and the answering *ποντίων κυμάτων ἀνήριθμον γέλασμα.* It is grievous enough to fail in life, but it is vainly humiliating, having failed, to weep; ever, to be weak is to be miserable; and, although we may sorely lament the tragedy of a miserable life, yet, as beings endowed with reason, we must acknowledge that no one has unrighteously come to whatever pass he may be in—that he is justly as he is inevitably there, as the definite result of certain co-

operating causes. Unhappy Lear, raving in boisterous passion to the furious blasts, shrieking in senile anguish to the flashing lightning, his white head pelted by the merciless storm, is certainly a pitiable object, but really a right, natural, and therefore satisfactory object; for if any one who has lived as long as Lear had lived, has gained no better insight into his relations than he had, and knows no better than to do as he did, does not that man righteously deserve Lear's fate? As righteously surely as the man who drops a spark into the barrel of gunpowder on which he is sitting deserves to ascend with rocket-like rapidity into the air and to descend in far-scattered fragments of mortality, "a formless ruin of oblivion." Great natural sensibility is quite compatible, in persons of good intellectual endowment, with what might seem to be the coldest hard-heartedness; perceiving, as they do, the causes and relations of the most unwelcome event, they see it to be inevitable, and cannot therefore be afflicted by it as those are who feel only its present painful character and are unable to realize its necessary relations. Pity is often the indolent gratification of self-feeling which shirks the duty of rational investigation. The question, to one who can look beyond his feelings, is not altogether one of compassion or hard-heartedness; it is rather a question whether there are laws in the universe by conformity to which a successful end in life is reached, and by rebellion against which ruin comes. Whoever will not profit by circumstances may confidently expect circumstances to profit by him. The pity of it is that, preach as philosophy may, man has often but little power of control over causes and conditions, for his character makes so much of his fate. "The dice of the gods are always loaded."

The sorrowful words of despondence and the bitter exclamation of regret, with which the first act ends, seem to indicate that Hamlet was conscious of that weakness in his character which unfitted him for the great and exceptional deed that had been imposed upon him. At the same time,

he did not shrink from taking up his heavy cross; and it is in his recognition of the sacrifice which his life must henceforth be that we find a partial explanation of his rude behavior to Ophelia; it was necessary to wipe all trivial fond records from the table of his memory. But there was real suffering in the strange pantomime in which he took a fantastic but reluctant farewell of the cherished hope of his life, real despair in the sigh "so piteous and profound as it did seem to shatter all his bulk and end his being." By an unconscious self-deception, the grief arising out of the gloomy presentiment of his desperate fate was transferred in part to the resignation of his love—the sorrow of his life-sacrifice casting its deeper shadow over the sorrow of his love-sacrifice. Furthermore, it is sufficiently plain, from the warnings which Laertes gives to his sister, from the commands which her father imposes upon her, and from her manner of addressing Hamlet, that his intercourse with her had been that of a superior with one in an inferior position; it was of a freer and less respectful character, therefore, than is customary between lovers who are equals; he had patronized her with his love. Under these circumstances, it was the natural but unworthy consequence of his feeling of superiority that he did not exhibit that gentle consideration which he might otherwise have done, even though, in obedience to her father, Ophelia had repelled his letters and denied his access.

The direct occasion of his rude and singular behavior in the presence of Ophelia is, however, the inseparable blending of genuine affliction with his feigned extravagance; conscious dissimulation was almost overpowered by the unconscious sincerity of real grief. In the moody exaggeration of his letter to her there is the evidence of true suffering; but he was compelled to dissimulate because he could not trust even her with his plans. No design, therefore, could have been more skillful than that which he carried into execution; the strange guise which he purposely assumed was excellent-

ly well conceived to deceive the king and those about him, initiating, as it did, with consummate ingenuity, the systematic feigning of madness. Nothing was so likely to make them believe in the reality of his madness as the conviction that they had discovered the cause of it. Flatter a man's intellectual acuteness, and he will be marvellously indulgent to your folly or your vice, stone-blind to your palpable hypocrisy. Polonius fell headlong into the trap which had been set for him; the vain old dotard who had grown gray amid intrigues and lies, who possessed the memory only of wisdom, and who, in his professional eagerness to hunt the trail of policy, was stone-blind to the gross and palpable realities, seized the bait, and was forthwith prepared to set forth, not only "the very cause of Hamlet's lunacy," but, with a false and fruitful invention, the successive stages of its invasion. When, in a subsequent scene, Hamlet says to Ophelia, "Your father is a fool," it was in angry and truthful earnestness that he spoke. To his proud and sensitive nature it was a grave offence that she whom he had loved should consent to be the creature of her father's stupid plots against him, that she should sully her purity and loyalty by complicity with a foolish, prating, convenient knave, whose scheming Hamlet easily saw through, and whose courtly insincerity of character he detested. When he was alone in the world, as one entrusted with such a task as he was must by the nature of things be, when he was betrayed by friends and benetted round with villanies, it must have been a terrible grief to resign his love for Ophelia, to give up the one dear weakness; but it must have added a pang to the deepest grief to discover that she also was of the number of those who were conspiring against him. It was difficult not to be violent under such circumstances, but the very violence of his conduct was evidence of his love. More than sufficient, then, are the reasons for Hamlet's rough behavior to Ophelia, without supposing that it had "no other excuse but the sad excuse of a disordered mind;" one can scarcely,

indeed, understand why some should reprobate it as an inexcusable offence to the innocent simplicity of the maid who had with so little compunction betrayed him. Here, as elsewhere, Shakespeare will be found to be much more true to Nature than his critics; he knew women as women know each other.

On considering the character of Hamlet as displayed in the events of the drama, it is sufficiently easy to remark that it is essentially a weak character so far as power of action is concerned. He is dragged along by circumstances to destruction, and, when dying, does by the merest accident, under a sudden impulse, that which he had been meditating through the scenes of a five-act tragedy. It is noteworthy that in drama, to which action might be thought essential, there is here a hero who never acts; and yet Shakespeare has contrived to make him intensely interesting to us by the clear insight which he affords us into the workings of his much-revolving mind. A man struggling with inward troubles is not less, but even more, interesting than one who is fighting with outward difficulties; only it is a very much more difficult spectacle for the artist adequately to present. Shakespeare has, however, been eminently successful; by exhibiting to us the various motives which arise in a meditative mind to paralyze the strong motive to a certain deed, he has excited our earnest sympathy for a character which, so far as action is concerned, is almost negative. The catastrophe is so contrived, therefore, as Goethe has admirably observed, as to appear accidental and a fulfilment of destiny rather than the result of human acts. In truth, the character of Hamlet and the circumstances in which it is placed make destiny; and, from the relations of the two, to display the necessary law of the evolution of fate, would seem to be the deepest aim of the drama.

It does not appear that Hamlet felt any great moral repugnance to the act which had been imposed upon him; and indeed, at the time in which he is represented to have lived,

revenge for a father foully murdered—the act inculcated directly by a messenger from the other world, and that messenger his father's ghost—must have become a solemn and righteous duty. It is the meditative character of his mind which paralyzes the power of action; he considers events in so many relations, and forecasts possibilities with so nice an ingenuity that he is unable to come to any resolution. He sincerely accepts the sacred duty which the buried majesty of Denmark imposes upon him, and never relinquishes the idea of accomplishing the commanded vengeance; but it is the misery of his nature that he is incapable of dismissing the idea from his mind, or of carrying it into execution. He eagerly seeks for excuses for delaying action; to some extent he plays the hypocrite to himself when he finds a reason for his irresolution in the uncertainty as to the ghost's reality; and afterward, when he surprises the king at prayer, and has an excellent opportunity for executing his task, he sets forth an elaborate and villanous reason for not doing what he cannot resolve to do. It is not so much that he wishes to surprise the king in some deed that "hath no relish of salvation in it"—it is not that he truly cherished the fiendish sentiments which he utters—which now causes him to let the opportunity go by, but that he gladly seizes on any excuse for procrastination. At a critical juncture, in which it might seem impossible to coin any justification for not acting, Hamlet's active mind finds a motive for further delay in a reasoning which maligns his moral nature, but which is in exact accordance with his intellectual character.

This state of reflective indecision is a stage of development through which minds of a certain character pass before they consciously acquire by exercise a habit of willing. He who is passionately impulsive and has no hesitation at eighteen, is, perhaps, reflective and doubtful at twenty-five; and in a few years more he may, if he develop rightly, be deliberately resolute. For the will is not innate, but is gradually built up by successive acts of volition: a character, as Nova-

lis said, is a completely fashioned will. Had Hamlet lived and developed beyond the melancholy stage of life-weariness in which he is represented, and through which men of a certain ability often pass, it may be supposed that he would have been affected very differently by a deed like that which was imposed upon him. Either it was a duty, and, according to his insight into its relations, practicable, and he would then lay down a definite plan of action; or it was not, according to his judgment, practicable, and he would then dismiss the idea of acting, and leave things to take their course. As years pass on, they bring surely home to the individual the lesson that life is too short for him to afflict himself about what he cannot help. There is a sufficiency of work in which every one may employ his energies, and things irremediable must be wisely left to take, unbewailed, their way. To rail at the events of Nature is nothing else but the expression of an extravagant self-consciousness; it is the vanity which springs from an excessive self-feeling that finds the world to be out of joint, and would undertake to set it right. He only would undertake the government of the universe who cannot govern his own mind. The wisely-cultivated man, conscious how insignificant a drop he is in the vast stream of life, learns his limitation and accepts events with modesty and equanimity.

When Hamlet does any thing, he is usually determined by some accident, and acts under the influence of a sudden impulse. In fact, as he said that Polonius was at supper, "not where he eats, but where he is eaten," so we might say of him that he is engaged in a drama, not where he acts, but where he is acted upon. The consequence is, that a variety of incidents necessarily takes place; there is no definite will giving to events a certain direction, and the progress of the play is delayed accordingly. As Hamlet does not act upon the circumstances, they crowd around him, and grow, as it were, upon him: more and more difficult does it become for him who does not develop in proportion to the development

of events, to act. "Here is an oak platted in a vase proper only to receive the most delicate of flowers. The roots strike out, the vessel flies to pieces." Hamlet's deliberative inaction and his impulsive action alike increase the difficulties around him: an irresolute man is like a magnet to attract difficulties about him; an impulsive man often multiplies them by his spasmodic energy, which irritates and increases antagonisms—not otherwise than as intermittent pressure upon some part of the body solicits a hypertrophy of the tissue beneath, when a continued pressure produces an atrophy. He passionately demands of the ghost—who is the villanous author of his miseries—that with wings as swift as meditation or the thoughts of love he may sweep to his revenge, and in a little while doubts whether the ghost is not a coinage of his distempered brain; he recklessly follows it when it beckons him, registers a solemn vow to remember it as long as memory holds its seat, and quietly takes ship for England. He stabs Polonius under a sudden impulse when he hears a noise behind the arras, and soliloquizes elaborately when he finds the king alone at his prayers. When the pirate vessel overtakes the ship in which he is sailing for England, he impulsively boards it and is carried away. When he sees Laertes jump into Ophelia's grave, he jumps in also, and rants more wildly than Laertes. When he learns that the sword is poisoned, on the instant he stabs the king. If we except the scheme by which he makes use of the players, the only thing which he does deliberately is to feign madness, and he adopts that resolution with a strange suddenness. As a matter of policy, it was difficult to see how such feigning could be of advantage to his purpose; as a matter of fact it was dangerous, and all but wrecked his design.

The melancholy and life-weary frame of mind in which Hamlet is represented was exactly that likely to be produced in a young man of his disposition under his circumstances. He was of a proud and generous nature, nobly ambitious, the accomplished scholar, soldier, and courtier. He had grown

up supported by his great father's countenance, and accustomed to the respect and homage which attend upon the king's son and the expected heir to the throne. But his father dies suddenly, and his uncle "pops in between the election and his hopes," and not in a straightforward and honorable manner; but by underhand cunning steals the precious diadem like a cutpurse of the empire—a treacherous, kindless villain that he was. And now all is sadly changed. Hamlet is almost a stranger in what was his father's house, and scarce welcome there where he had been the observed of all observers. "I will not," he says to Rosencrantz and Guildenstern, "sort you with the rest of my servants; for, to speak to you like an honest man, I am most dreadfully attended." Though he is still the "most immediate to the throne," though he has the voice of the king for his succession in Denmark, his sincere nature is disgusted by the experience of such villany in a kinsman, as his ambition is disappointed by the failure of his expectations, and his royal pride injured by the attendant diminution of personal consequence.

"*King.* How fares our cousin Hamlet?

Hamlet. Excellent, i' faith, of the chamelion's dish; I eat the air, promise crammed: you cannot feed capons so."

It is not so much the loss of the throne which overwhelms him—although unconsciously that embitters his grief—as the treachery which he has awakened to. The loss of faith in humanity oppresses his soul; he has learned, in a painful but decisive way, that "a living dog is better than a dead lion." Those who a few months ago would make mouths at his uncle, now give fifty or a hundred ducats "for his picture in little."

But worse, far worse than all the disappointment of his expectations is, to his proud and sensitive nature, the marriage of his mother. He feels himself infinitely degraded in the bitter degradation of his mother.

"Would I had met my dearest foe in heaven
Ere I had seen that day, Horatio!"

That it should come to this, that his mother, almost before her tears for so excellent a king were dry, should not merely desert the cause of her only son, but hastily marry him who had treacherously supplanted her son. To a proud nature what can be more afflicting than the deep disgrace of a mother? And as it is impossible, when offended with any one, not to think him worse than he really is, so Hamlet becomes utterly horrified and frantic as he broods over his mother's conduct.

> "O Heaven! a beast that wants discourse of reason
> Would have mourned longer—married with mine uncle,
> My father's brother; but no more like my father
> Than I to Hercules.
> . . . . . .
> O most wicked speed, to post
> With such dexterity to incestuous sheets!
> It is not, nor it cannot, come to good."

The matter is made almost unendurable to him by the exceeding activity of his imagination; he torments himself continually with vivid pictures of the scenes of his mother's intercourse with her new and odious husband. Some have been offended at the coarse and naked way in which, in his interview with his mother, he dwells so minutely upon the king's amorous dalliance, and have censured his brutality; they would, for the sake of the proprieties, destroy the consistency of the character, and have revolutions made with rose-water. This so-called indelicacy of Hamlet is a special excellence, for it is the consistent result of his active self-torturing imagination. Truly, imagination has its pleasures, but it has its pains also: it inspires the creations of genius, but how much of the miseries of genius does it not create! It has been said again that his language was unnecessarily violent, and that he abused the king in terms which were almost false from their extravagance. True; but he had to produce an impression on one who had eagerly accepted this man for her husband, and showed no inclination to rue her

indecent and unjust act. That could scarce be done in gentle tones and words of honeyed sweetness; he must exaggerate like the actor in order to excite a feeling corresponding to the reality, and must thunder the unwelcome truth into unwilling ears. Of all things it seems most irrelevant to discuss the morality of Hamlet's behavior; the only questions with regard to it are whether it is true to Nature generically, and whether it is a consistent evolution of individual character. It should be borne in mind that, if Hamlet acted with rude violence, he did not act with inconsiderate passion; from a conviction of duty he entered his mother's presence with a deliberate purpose of speaking daggers. But how hard a thing it is for human nature to escape self-deception! The severity with which he reproached his mother for her quick forgetfulness of his father, was an unwitting alleviation of the reproaches of his own conscience for neglecting to carry into effect that father's solemn injunctions; in rebuking his mother he rebuked himself also. How admirably well-timed, therefore, the second appearance of the ghost! By that visitation he is reminded that he is not himself blameless, and is enjoined to spare his mother, just at the moment when he is flattering his conscience with a righteous indignation against her.

In that deep gloom which painful circumstances have produced in his sensitive mind, the things of the world may well appear stale, flat, and unprofitable; and in the fitful exacerbations of his melancholy, the tedious formalities of Polonius, and the studied exhibition of royal hypocrisy, excite an immeasurable disgust. He ruthlessly strips off the conventional delusions from things and lays bare the realities; he utters the severest home-truths with the greatest satisfaction. "These tedious old fools." If any one in the full possession of his reasoning powers refuses to accept the delusions of life, and persists in exposing the realities beneath appearances, he is so much out of harmony with his surroundings, that he will, to a certainty, be counted more or less insane. Strange

Strange too, as it may seem, it is nevertheless true that such a one will commonly feign to be more eccentric or extravagant than he really is. Though intellectually he can contemplate objects and events in their extreme relations, his self-feeling incapacitates him from regarding himself objectively; and there is a certain gratification or vanity in acting extravagantly, and in being thought singular or mad. Doubtless, there was some solace to Hamlet's self-feeling in the mad pantomime by which he frightened and took leave of Ophelia; he was miserable, but there was conceit in his misery. He perceives the things of this world to be stale, flat, and unprofitable; but, by reason of his great self-feeling, he feels them much also. Had he recognized himself as a part of the stale, flat, and unprofitable things, he must have concluded that his individual feelings were of very little consequence to the universe, that there were many more woful pageants than the scene wherein he played, and have thereupon attained to a healthier tone of mind. Hamlet possessed a great power of generalizing; but he mostly generalized within the circle of his self-feeling.

Supposing that Hamlet had set himself to transcend the present by annihilating in thought those conditions or generalizations of human perception which are called space and time; how infinitely little must have seemed the narrow sphere of events in which he was concerned! For side by side before his mental eye he would have, as it were in picture, the countless sufferings which had been borne by men in every age, and which were being borne in every part of the earth: minds bowed down in despair through the cruelest oppressions, deaths through lingering agonies of torment, events crushing down the noblest resolves, and self-sacrificing heroism swept away by the irresistible current of triumphant wrong—all these clustered around him would be present to his mind; and among them, scarce discernible, there would be the sorrows of Hamlet the Dane. Man creates space and time, and then becomes the slave of his own creation. Let

him emancipate himself, and Socrates is drinking the hemlock before his eyes; in his ears is sounding the last despairing cry of agony from the cross of Calvary; he sees the bloody Piedmontese rolling the mother and infant down the Alpine rock; and is an excited witness of the martyr's dying agonies, and glorious victory. Happily or unhappily, self-feeling is too strong for such renunciation; and each one thinks, as Hamlet did, that never mortal was tried as he is tried, and that never were events of such importance as those wherein he is engaged. "Is it nothing to you, all ye that pass by? Behold, and see if there be any sorrow like unto my sorrow, which is done unto me."

Most people of a certain mental capacity pass at some period of their lives through that stage of life-weariness which is generated of great self-feeling—the stage of Byronism or Werterism. If the diary of his youth were opened, many a one might feel surprise, and something of shame, at the woful feelings recorded there, and at complaints of the hollowness of life as bitter as those of Hamlet, without there having been Hamlet's cause for them. It is a condition from which each one has to deliver himself, if he will develop rightly; in one way or other he must lay the devil Self wherewith he is possessed, and press forward to a calmer stage of insight in which feeling is subordinated to reason. Whether it be in the sorrows of Werter, or in the sorrows of Teufelsdröck, in the Psalms of David, or in the mournful words of the Preacher, or in what other form it be, the sorrow must be embodied and then left behind. In the waste of turbulent feeling, in the chaos of mind, must it be, as it was on creation's first day, when the Spirit moving on the face of the water said, "Let there be light," and that which was "without form and void" became order and harmony. The cry is:

> "Ah! what should I be at fifty
> Should Nature keep me alive,
> If I find the world so bitter
> When I am but twenty-five?"

And the result is that he who writes the "Sorrows of Werter" at twenty-five, writes "Faust" at fifty.

Let it not any longer escape attention that the deliberate feigning of insanity was an act in strict conformity with Hamlet's character; he was by nature something of a dissimulator, that faculty having been born in him. Though it is not said that his mother, the queen, was privy to the murder of her husband, yet from the words of the ghost, who prefaces his revelations by stating how the uncle had "won to his shameful lust the will of my most seeming virtuous queen," it would appear that if she were not actual party to the crime, she was something almost as bad: and at any rate, she, a matron of nearly fifty years of age—"an age at which the hey-day of the blood is tame and waits upon the judgment"—had within two months of her husband's death rushed with wicked speed to incestuous sheets. Well, in truth, might her son exclaim, "O wonderful son, that can so astonish a mother!" But if Hamlet's character had received no taint from his mother, he was not altogether so fortunate on his father's side; for he was the nephew of the "bloody bawdy villain"—the "remorseless, lecherous, treacherous, kindless villain." We see, then, the signification which there was in his speech to Ophelia—"You should not have believed me; for virtue cannot so inoculate our old stock but we shall relish of it." His uncle, however, appears to have absorbed all the vice of the stock for his generation, as one member of a tainted family is sometimes seen to drain off, as it were, the bad blood of it. Hamlet's father was a brave and noble king, take him for all in all, one whose like would not be seen again, and, compared with his successor, "Hyperion to a satyr." In the shadowy view of him which we have as he flits past in ghostly form, we recognize the generous tenderness of his soul:

> "Nor let thy soul contrive
> Against thy mother aught; leave her to Heaven."

And again:

> "O step between her and her fighting soul;
> Conceit in weakest bodies strongest works:
> Speak to her, Hamlet."

As a heritage, then, Hamlet has that hatred of under-hand cunning and treachery, that sincerity of nature, which justify Laertes in describing him as "free from all contriving:" and, as a heritage also, he has that faculty for dissimulation which is evident in his character. Explain it how we may, it is certain that a self-feeling mortal, who, so far as conscious life is concerned, is perfectly sincere, who energetically rebels against the deceit or wrong-doing of others, is sometimes o'ermastered and deceived by his unconscious nature, so that he is an actual unwitting hypocrite as regards his own life. Hamlet is free from all contriving with selfish aim to injure others, but he feigns with sustained method, with a skill which could never be learned, for his own protection. Had he lived, we may believe that, as years went on, he would have more and more clearly displayed the virtues of his paternal antecedent. "He was likely, had he been put upon, to have proved most royally." Strange as it may seem, we not uncommonly observe the character of the mother, with her emotional impulses and subtle but scarce conscious shifts, in the individual when young, while the calm deliberation and conscious determination of the father come out more plainly as he grows older. Setting aside any necessity which Shakespeare might think himself under to follow the old play, it is in Hamlet's inherited disposition to dissimulation that we find the only explanation of his deliberately feigning madness, when, to all appearances, policy would have been much better served if he had not so feigned. But he has a love of the secret way for its own sake; to hoist the engineer with his own petard, is to him a most attractive prospect; and he breaks out into positive exultation at the idea of outwitting Rosencrantz and Guildenstern, with whom he was to go to England.

"It shall go hard
But I will delve one yard below their mines,
And blow them at the moon; *O, 'tis most sweet,*
When in one line two crafts directly meet!"

The first words which he utters, again, after the success of the play which he had devised to catch the king, are, as Gervinus has pointed out, not words of gratification at the result, but admiration of his own constructive skill; for he asks whether his plot would not any day get him a fellowship in a company of players. Again, with what a calm deliberation and congenial cunning—no feeling of disgust at an unpleasant necessity—does this man who rails so bitterly against his uncle's treachery proceed to open the letter which his companions carried, ruthlessly substituting their names for his own, though there was no evidence that they were privy to the plot against his life.

Some people are so constituted that they must do things in a secret manner when there is no possible advantage to be gained by secrecy. Burrowing underground like moles, they are all the time as blind as moles are wrongly said to be, and usually seem to think that everybody else is so too. Hamlet did not deceive the crafty king by his feigned madness; and had not a stronger power than human will been on his side, it would have gone hard with him. If, as he professed, he essentially was not mad, but mad in craft, it was verily a a most mad kind of craft. The king suspects from the first that there is some unknown cause more than his father's death which thus afflicts him, and is anxious to discover it; he speaks also of "Hamlet's transformation," not of his madness, in the first scene with Rosencrantz and Guildenstern. Again in the next scene he asks—

"And can you by no drift of conference
Get from him *why he puts on this confusion?*"

And when Polonius, with senile vanity and doting garrulity, sets forth what he deems to be the very cause of Hamlet's

lunacy, and with a lying invention runs through the stages of its invasion, the short answers and abiding doubts of the king prove that he did not believe the old man's story: "How may we try it further?" He will in company with Polonius act the spy to satisfy himself whether it is the affliction of his love or not that Hamlet suffers from. And when he has been a witness of the scene between Hamlet and Ophelia, he is convinced that it is not madness, but something dangerous in his mind, which is the cause of his strange behavior:

> "Love! his affections do not that way tend;
> Nor what he spake, though it lack form a little,
> Was not like madness. There's something in his soul
> O'er which his melancholy sits on brood;
> And I do doubt the hatch and the disclose
> Will be some danger."

Quickly he resolves that Hamlet shall go to England; and wisely does he do so, considering the words which he had just overheard: "I say we will have no more marriages; those that are married already, *all but one*, shall live; the rest shall keep as they are."

The insanity, then, which Hamlet exhibits is not of a simple character. There is actual feigning, as he himself confesses, as the vigorous coherence of his profound soliloquies and his unfeigned speeches proves, as the king plainly recognizes, and as the deep significance of his wilful extravagances—the "method in his madness"—testifies; but there is beneath all that a real melancholic mood of mind, a genuine morbid subjectivity, of which he is himself keenly conscious, and which he has admirably described:*

"I have of late (but wherefore I know not) lost all my mirth, foregone all custom of exercise; and, indeed, it goes so heavily with my disposition, that this goodly frame, the earth, seems to me a

* This view is taken also by Dr. Bucknill in his analysis of the character of Hamlet, in the "Psychology of Shakespeare," a second edition of which has appeared under the title of "The Mad Folk of Shakespeare."

sterile promontory; this most excellent canopy, the air, look you—this brave overhanging firmament; this majestical roof, fretted with golden fire—why, appears no other thing to me than a foul and pestilent congregation of vapors. What a piece of work is man! How noble in reason! how infinite in faculties! in form and moving how express and admirable! in action, how like an angel! in apprehension, how like a god! the beauty of the world! the paragon of animals! And yet to me what is this quintessence of dust? Man delights not me, nor woman neither; though by your smiling you seem to say so."

His great natural sensibility and his very active imagination would combine to render Hamlet distrustful of himself, averse to active courses, and seemingly timid, so that he might justly describe himself as one not easily moved to anger; but that very sensibility of character would be the cause of great excitability on the occasion of a sudden event pressing unavoidably upon him, and leaving him no time for reflection. Even in the feigned exhibitions of madness there are sincere outbreaks of his excitable disposition. When he would feign, he is so genuinely moved that he falls out of his character, and speaks with such sincerity and significance that the king rightly suspects a plot. He spoils the part which he should play because he is too much interested in the events, and cannot lay aside his personality. Marvellous beyond all explanation is the subtile and artistic skill with which Shakespeare has thus preserved the consistency of Hamlet's real character amid all the extravagant displays of his assumed character. He exhibits Hamlet in spite of himself—his unconscious nature overpowering his conscious dissimulation.

It marks, again, the intellectual preponderance which was so special a feature of Hamlet's character, that he can reason so well about his own morbid feeling, and take deliberate steps to test the extent of his infirmity. In such a miserable mood of mind there is great cause for self-distrust; the ghost which he has seen may be a coinage of the brain, "a subjective bodiless creation, which ecstasy is very cunning in."

"The spirit that I have seen
May be a devil; and the devil hath power
To assume a pleasing shape; yea, and, perhaps,
Out of my weakness and my melancholy
(As he is very potent with such spirits)
Abuses me to damn me."

It is with deliberation, therefore, that he seeks for a means of testing his condition, and with eagerness that he embraces the opportunity which the arrival of the players affords him of obtaining confirmation of the ghost's story:

"If his occulted guilt
Do not itself unkennel in one speech,
It is a damnèd ghost that we have seen;
And my imaginations are as foul
As Vulcan's stithy."

When the behavior of the king at the play has proved that no morbid imagination has created the horrible revelations of the ghost, then he passionately flings aside such a suggestion of his mother:

"Mother, for love of grace,
Lay not that flattering unction to your soul,
That not your trespass, but my madness, speaks."

So sure as he now is of the ghost's reality, still he does not act. Herein how different does he show himself from Laertes! The mere whispers of calumny excite Laertes to furious action; he sends allegiance to hell, vows to the blackest devil, dares damnation, but will be revenged for his father's death; to that point he stands, let come what come may. Hamlet, on the contrary, has the solemn evidence of a spirit from the dead, and the strongest possible motive for revenge, but meditates so much that he can come to no resolution. Laertes is mastered by his passion, which hurls him into desperate action; Hamlet has such mastery over passion that it cannot become a sufficient motive for action—his intellectual superiority makes him practically inferior. He is

himself quite aware of his deficiency, and analyzes his own state of mind with great accuracy:

> "Or some craven scruple
> Of thinking too precisely on the event—
> A thought which, quartered, hath but one part wisdom,
> And ever three parts coward."

He recognizes that rightly to be great is not to stir without great argument, but, once satisfied, to throw aside all care for consequences—to make mouths at the invisible event. He reproaches himself as "a rogue and peasant slave," that, with the motive and cue for revenge which he has, he still hesitates; and yet his unconscious nature overmasters his intellectual consciousness, and he does nothing.

Although we admit that Hamlet's failing was want of power of action, it must be allowed that Hamlet's misfortune was the want of a proper sphere of action. That excess of imagination which paralyzes resolution would most likely have disappeared under a life of activity: "The hand of little employment has the daintier sense." It is the fault of minds like his that they over-estimate realities; they live in an ingeniously-devised, complex world of imagination, rather than in a comparatively coarse, actual, external world, and balance possibilities with so great a subtilty that there is no resultant force of will. A person of great intellectual activity is prone to attribute to others as deep a penetration into things as that which he has himself; he does not dare to speculate sufficiently on the stupidity of mankind. Accordingly, the successful man in the practical affairs of life is he who does not see too much, who sees distinctly only that which he wishes, and who, therefore, not doubting himself, acts with definite purpose and determined energy. To the conscientious man of great reflective habit, it is sometimes a real affliction when he must definitely act; and he would truly do well, for his own comfort's sake, to rush at a resolution with a certain wilful blindness—to allow, if need be, the fall of a coin to determine his course; but, having once

resolved to work definitely with all his might to the end. Any one may deliberate till death overtakes him before he is sure, and Nature charges herself with compensation. "He that observeth the winds shall not sow, and he that regardeth the clouds shall not reap." The longer any one lives, the more deeply is he satisfied of the truth of the saying that the world is governed with extremely little wisdom; he perceives that he has often given men credit for foresight where they have wisely held their peace and profited by events, and that in a matter of which he had but little knowledge he has sometimes assumed the profoundest policy in what was really a blundering accident. As the events of practical life insist upon action, the deliberative man is ultimately forced to shut, as it were, one eye—to act even when the motive does not satisfy his intellectual consciousness. Custom lends a kind of easiness to subsequent attempts, and that which was at first a painful trial becomes in time an easy habit.

The shortness of his allotted span, and the exigencies of life, will not permit any one the luxury of over-estimating his powers or his responsibilities; he must be content as an atom doing its inevitable work in the universe, accepting calmly the fate of his nature, cast his follies and his wise acts with equal tranquillity into the great whole, which, under the guiding law of its destiny, will surely shape them to their proper ends. Were a man but to think of it, the responsibility of not acting is sometimes infinitely greater than that of the most rash act. Suppose that Hamlet had killed the king directly he was appointed by Nature the minister of its revenge, what a host of calamities would have been spared! Then Ophelia had not, after a miserable madness, been drowned; her father had not been accidentally stabbed; Rosencrantz and Guildenstern would not then have been executed; and Hamlet himself, his mother, and Laertes, would not have perished in a common ruin. A catalogue of horrors was the result of Hamlet's great feeling of responsibility in the important scene wherein he played, as in humbler scenes

a catalogue of mischiefs is frequently the result of an irresolution springing from an over-estimated responsibility. Let a man be never so wise, he must sometimes drift at the mercy of fate, without anchorage; and let a man be never so fool-hardy, fortune will sometimes bring his boat safely into the harbor. "The race is not to the swift, nor the battle to the strong, nor yet riches to men of understanding, nor yet favor to men of skill; but time and chance happeneth to them all"—a truth which Hamlet had not failed to recognize in his experience:

> "Rashly,
> And praised be rashness for it; let us know
> Our indiscretion sometimes serves us well,
> Where our deep plots do pall; and that should teach us
> There's a divinity that shapes our ends,
> Rough-hew them how we will."

How admirably throughout the play is exhibited the want of harmony which so often exists between intellectual speculation and the feelings which are the genuine utterance or mirror of the nature—the conscious life over which there is control, and the unconscious life which so constantly overtakes and overpowers the individual! It is as if Shakespeare had wished to point out that, how wisely soever man may reason, it is still impossible for him to shake off the unreasonable feelings which are deeply planted in his nature. The irresolution of Hamlet is in part owing to a continual oscillation between these warring elements of a nature not in harmony with itself. The king proves to him with convincing logic that it is folly to indulge an unceasing grief for a father dead; but, notwithstanding that the arguments are unanswerable, Hamlet is not cheered. To shuffle off this mortal coil Hamlet perceives to be a consummation devoutly to be wished; and yet the unaccountable fear of something after death sicklies o'er the native hue of resolution. Imagination, not considering too curiously, may follow the noble dust of Alexander to the bung-hole, and yet Hamlet cannot but fear that death may not be a dreamless slumber from

which no archangel's trump shall ever wake him. Reason as convincingly as philosophy may, it never convinces the feelings; though dismissed with excellent and unanswerable logic, they return again and again, and, like Rachel weeping for her children, refuse to be comforted. What, indeed, does philosophy avail, "unless philosophy can make a Juliet?"

"Go to: it helps not—it prevails not. Talk no more."

The appearance of the forces of young Fortinbras, and Hamlet's soliloquy after his encounter with them, have been thought by some—even by Goethe—to be needless events, which uselessly delay the action, and improperly dissipate the reader's attention. But is it not in exact accordance with Hamlet's irresolution that the action of the drama should be delayed? Is it not well that the reader's imagination should be made to wander, and by presenting a sort of reflection of the manifold considerations of the much-meditating Hamlet, enforce a certain sympathy with him? Not only, however, does this scene exhibit Fortinbras, who "for a fantasy and trick of fame," "even for an egg-shell," is content to expose himself to danger and death, as a striking contrast to Hamlet, who, with the strongest motive for revenge, can do no more than "unpack his heart with words, and fall a-cursing like a very drab;" but it affords to Hamlet an excellent occasion for a close self-analysis, and seems to reveal to us a real development of his character. At our first meeting him it is immediately after his father's death, when he has just returned from college, and when we may justly think that he has come upon his first serious trial in life; but, in his soliloquy after meeting with Fortinbras, we see his character as it has been developed before our eyes under the severe but successful training of a mighty sorrow:

"Night brings out stars, as sorrows show us truths."

It is not a passionate and furious soliloquy like that in which he bursts out after his interview with the players, when he reviles himself as a rogue and peasant slave, and

lashes himself into a great fury; it is not the gloomy meditation of a morbid mind, wishful to end by self-destruction the heartache and the thousand natural woes that flesh is heir to; but it is a passionless and intellectual soliloquy, at the end of which he makes a deliberate resolution. In the previous soliloquy he is violent and demonstrative, but the passion subsides, and with it the resolution vanishes. As calmness returns, matters do not seem so clear; the ghost may have deceived him; action seems most desperate; and the determination—as all emotional resolves not at once carried into effect are apt to do—melts away:

> "What to ourselves in passion we propose,
> The passion ending, doth the purpose lose."

But now that he has definitely resolved, after reflection, to execute the vengeance with which he is charged, he makes a deliberate resolution of the will:

> "O, from this time forth
> My thoughts be bloody, or be nothing worth."

Shakespeare's views of destiny very closely resemble those which are met with in Æschylus and the ancient poets. The fatal catastrophe in "Hamlet" is so contrived, it has been said, as to appear a fulfilment of destiny rather than the result of human act; but it is the marvellous excellence of Shakespeare that he represents his characters as a part of destiny; the consummation is exhibited as the inevitable product of the individual character and the circumstances in which it was placed. Hence it is that his villains, though monstrously wicked, as Iago, or unnaturally cruel, as the bastard Edmund, do not excite unmitigated anger and disgust, but rather interest and a sort of intellectual sympathy, and that the virtues of his best characters appear not as merits, but as necessary results of their natures. He always implies a difference in nature between one person and another, "wherein they are not guilty," or wherein they are not meritorious, and displays in a natural evolution the necessary

result which the fate of his character and his circumstances makes for each one.

How surely do all things work together in "Hamlet" to the dreadful catastrophe! The pirate-ship, appearing from unknown regions of the ocean, has its appointed part equally with the impulsive character of Hamlet in accomplishing the unavoidable destiny. The king exercises foresight, and plots desperately to ward off the evil; but the hand of Fate is against him, and his deep-laid schemes are confounded by the most unexpected accident. Hamlet cannot lay down a plan of action for doing what he must do; but the hand of Fate is with him and drives him on to his end. "The hour of doom arrives, and the innocent and the guilty, the erring and the avenger, all perish." And yet, had not Hamlet accidentally stabbed Polonius behind the arras, his secret would have been betrayed to the king; had he not by chance got hold of the poisoned foil in his combat with Laertes, the king might have lived on in his sceptred guilt. In the end it was the merest chance that Hamlet did live to accomplish his revenge; for he was the first wounded by the envenomed rapier, and might easily have died before Laertes, who tells him of the king's treachery. And when he does stab the king, it is rather an impulsive act of vengeance for the last villany disclosed than from any remembrance of his father's murder or the command of his father's ghost; he becomes at last the accidental instrument of a punishment which he had long schemed, but schemed in vain. But retribution for the wicked king was written down in the book of destiny; Nature sent forth a spirit from her secret realms to declare it, and human will was powerless to hasten or avert the hour of doom.

With what a terrible and gradually-evolving certainty, again, does the crime of the king revenge itself! The curse of his crime tracks the culprit with an unrelenting persistency; though he hide never so cunningly, turn again and again in his course, and struggle with unspeakable energy, yet it

brings him down at last. All the perfumes of Arabia cannot sweeten the murderer's hand, nor all the waters in the ocean wash out that single drop of blood:

> "Is there not rain enough in the sweet heavens
> To wash it white as snow?"

No; foul deeds will rise to men's eyes though all the earth overwhelm them; and "murder, though it have no tongue, will speak with most miraculous organ." The death of Polonius, which the king would on every account so willingly have prevented, becomes the cause of undeserved suspicion against him, and the instrument of his humiliation; "the people are muddied, thick and unwholesome in their thoughts for good Polonius's death;" and "it has been but greenly done in hugger-mugger to inter him;" the mob, hasty and violent then as a Danish mob is still, arraign the king's person, and cry, "Laertes shall be king!" The incoherences of Ophelia, made mad by her father's death, her "winks, nods, gestures," move the hearers to collection, and "throw dangerous conjectures into ill-breeding minds," which "hotch the words up to fit their own thoughts." The ominous clouds are closing darkly in on the sultry day, the muttering of the threatening thunder is heard in the distance, and the fatal flash of the avenging lightning is every moment dreaded. "Each toy seems prologue to some great amiss," and sorrows coming, not "single spies, but in battalions," give superfluous death. For the queen's sake, whom his crime has made his wife, and because of the love which the distracted multitude bear to Hamlet, whom his crime has bereaved of father and of place, he cannot proceed directly against him. The gratifications which his sin has gotten him become fetters to prevent him from evading its consequences.

> "She is so conjunctive to my life and soul,
> That, as the star moves not but in his sphere,
> I could not but by her."

The consequences of a great crime, like the slimy folds of

some horrible serpent, coil faster and faster round the struggling victim; he strains at first with determined silent effort and vehement energy to undo them; then, as strength fails, and fatal Fate approaches, with shrieking cries and convulsive agonies, until at last we heartily pity his fierce anguish, and pray for the end of the terrible tragedy. The blessing or the curse of an act is its eternity; the pity of a wicked act is that it often involves the innocent with the guilty in a common ruin: "One sinner destroyeth much good."

Because poetical justice does not happen in the world, therefore Shakespeare does not make it his business to do poetical justice: he exhibits the gradual evolution of events and develops actions in their necessary consequences, neither approving nor censuring; the moral lesson which his works teach is the moral lesson which Nature teaches. Of all things, the most presumptuous and ignorant is that criticism which imputes it to Shakespeare as a fault or a crime that he has not shown a sufficient partisanship for virtue, that he has with tranquil indifference permitted the innocent equally with the guilty to suffer and perish when the law of events demanded it. To the sentimental idealist it would have been far more pleasing if a miracle had interposed and stayed the operation of natural law, so that Cordelia might not have been strangled like a dog, and Ophelia might not have been miserably drowned. Some such a critic it was who blamed Goethe for making Werter commit suicide, instead of rather making him repent and become a moral and a model young man. Some such a critic it must have been who found the death of Hamlet to be cruel and unnecessary. Alas that an angel did not still the troubled waters, and, putting forth a helping hand, rescue Hamlet from the whirlpool of events in which he was struggling! An angel not appearing, however, it was inevitable that natural law should take its course, and that the much-meditative, indecisive, and impulsive Hamlet should be crushed out by the inexorable march of events. Those who will find a moral in the matter may find it in this

instructive reflection: that Hamlet, who had made so large a use of guile during his life, himself perishes at last the victim of guile. It is plain that Hamlet has a recognition of the fate of which he is alike the victim and the instrument. Crime has no meaning for him who is appointed by Nature the minister of its revenge: "There is nothing good or bad, but thinking makes it so;" and it causes him no sorrow when he has slain the "unseen good old man."

> "Thou wretched, rash, intruding fool, farewell!"

And again:

> "For this same lord
> I do repent. *But Heaven hath pleased it so—*
> To punish me with this, and this with me,
> *That I must be their scourge and minister.*"

Thus commissioned, how could he afflict himself because a "foolish prating knave," whose life had been a system of intrigues, perishes the victim of his own scheming policy? In the path of Hamlet's destiny, as in the course of Nature, human life is of little account:

> "'Tis dangerous when the baser nature comes
> Betwixt the pass and fell incensed points
> Of mighty opposites."

By an inexorable necessity he must finish his course whatever may betide: he cannot turn aside to deplore an old man killed, or even hold back to spare the fair and gentle Ophelia, as the scorching lava-torrent cannot turn aside its course to let the modest violet live.

It is in this feeling of the sacrifice which he must be to his fate that we find the interpretation of the towering passion into which Hamlet falls at Ophelia's grave. "Oh, 'tis easy enough," might be his reflection, "to make loud wail and to invoke with passionate clamor the silent heavens; but what sort of grief is that which utters itself so loudly? Ophelia is dead; but could I not weep for her!"

> "I loved Ophelia; forty thousand brothers
> Could not, with all their quantity of love,
> Make up my sum."

Am not I of all mortals most wretched, that Orestes-like I am made the undesired instrument of Fate, and that benetted round with villanies I must go my unhappy course, fatal to those whom I most loved, cruel to those to whom Nature bids me be kind? But *one* life!—think of that—and it doomed to be a sacrifice! I too could rant; but it is no matter—do what you may, you are sure to be misunderstood:

> "Let Hercules himself do what he may,
> The cat will mew, and dog will have his day."

In that outbreak we have the genuine utterance of Hamlet's deeply-moved and fiercely-tried nature—an outburst of the pent-up feelings; and immediately afterward he is sorry that he has so forgotten and revealed himself; a proud and sensitive nature is ashamed of the exhibition of great emotion, and angry that it has descended to explain. But, in truth, the occasion was most provoking: to Hamlet, so conscientious, so full of consideration, so carefully weighing the consequences of his actions, so deeply feeling, and so sincerely abhorring mere passionate exclamation, it must have been intensely irritating to witness the violent and noisy demonstration of Laertes—a violence which surely betrayed a grief not very deep. It is so easy, such a relief, to rant and mouth:

> "Nay, an thou'lt mouth,
> I'll rant as well as thou."

Self-consciousness returns even while he is in the full burst of his passion: his great reflection scarce deserts him for a moment; he knows that he is ranting.

Before taking a final and reluctant leave of Hamlet, in whose company it would be easy and most agreeable to multiply pages into sheets, let us take notice of his last words to Horatio—more mournful words than which, mortal never uttered:

"*Hamlet.* But thou wouldst not think how ill all's here about my heart: but it is no matter.

Horatio. Nay, good my lord.

Hamlet. It is but foolery; but it is such a kind of gain-giving as would, perhaps, trouble a woman.

Horatio. If your mind dislike any thing, obey it: I will forestall their repair hither, and say you are not fit.

Hamlet. Not a whit; we defy augury; there is a special providence in the fall of a sparrow. If it be now, 'tis not to come; if it be not to come, it will be now; if it be not now, yet it will come: the readiness is all. Since no man, of aught he leaves, knows what is't to leave betimes. Let be."

In the tone of Hamlet's words at the close of the first act there was the formless presentiment of coming misery; and now again, in words which are almost his last, there comes over him the dark foreboding of the final catastrophe. The colossal shadow of his tragical end is projected over the closing scenes of his life, and his feeling thrills to its gloomy inspiration. As the appointed minister of Nature's vengeance for a great crime, he is in most intimate harmony with the rest of Nature, and an instinctive feeling, mysterious and inexplicable, forecasts unconsciously that issue by which it is subsequently interpreted. He defies augury from a conviction that his hour must come at the appointed time. With the unfailing certainty of destiny it comes; the "self-sacrifice of life is o'er;" and the "rest is silence."

One lesson which Shakespeare implicitly teaches is a lesson of infinite tolerance as the result of deep insight and a comprehensive view. Heartily do we sympathize with Hamlet is his great sorrow and sore trial; we esteem the faithful friendship and admire the cool judgment of Horatio; the treachery of Laertes, so greatly provoked as he was by events, does not excite unmitigated horror and render him inexcusably hateful—his repentance we accept with sincere satisfaction; and even the wicked king inspires sorrow rather than anger, though we abhor his deeds, and as he kneels to pray we would certainly forgive his crime if the decision lay

with us: believing that God will be kind to the wicked, as he has been kind to the good in making them good, we cannot give up the comforting hope that, after the day of retribution, the fratricidal king may find rest. No poet save Goethe approaches Shakespeare in the tolerant and emancipated point of view from which he contemplates humanity. On account of this surpassing excellence, some, fired by the restless presumption of their own infirmities, have dared to find fault with Shakespeare; they have blamed him because he has exhibited moral ugliness unveiled, because he was not sufficiently patriotic, and because he seemed more skeptical than was fitting. Imperturbable assurance! As if Shakespeare's far-seeing vision and penetrating insight could anywhere detect inexcusable vice; as if his mighty mind could be fettered by the littleness of skepticism, or could condescend to the selfishness of patriotism! Is it really a matter for regret to any mortal that Shakespeare has not given us the demented twaddle of the *Civis Romanus?*

From the evidence of his sonnets and of different plays—indeed, from the character of Hamlet himself—there can be no doubt that Shakespeare was at one time much tried, disheartened, and oppressed by the harsh experiences of life; he began, doubtless, as many others have done, by thinking life "a paradise," and found it, as others have done, "only a Vauxhall." But as Goethe advanced from the storminess of Werter to the calmness of Faust, so did Shakespeare rise in a glorious development from the subjective character of Timon to that lofty and pure region of clear vision from which he contemplated the actions of men with infinite calmness. His practical life was correspondent; by bending his actions to the yoke of his intellectual life—by living, in fact, his philosophy—he was able to work steadily in the painful sphere of his vocation to the end which he had proposed to himself. If Hamlet is a reflex of Shakespeare's character, it reflects a period ere it had attained to its full development—a stage in which the struggle between the feeling of the painful experi-

ences of life and the intellectual appreciation of them as events was actively going on—in which his nature was not yet in harmony with itself; but the crowning development of his philosophy seems to have been to look on all events with a serene and passionless gaze as inevitable effects of antecedent causes—to be nowise moved by the vices of men, and to see in their virtues the evolution of their nature. It is a probable conjecture which has been made, therefore, that Hamlet was sketched out at an earlier period of his life than that at which it was published, and that it was kept by him for some time and much modified, the soliloquies and large generalizations being some of them perhaps thus introduced, and the action of the play thereby delayed. The Hamlet of his youth may thus have been alloyed with a more advanced philosophy, and a character progressively elaborated which seems almost overweighted with intellectual preponderance. If this be so, it may account for the strange circumstance, that at the beginning of the play Hamlet is represented as wishing to go back to school at Wittenberg, when, as the graveyard scene proves, he must have been about thirty years of age.

The metaphysician who would gain a just conception of what human freedom is, could scarce do better than study the relations of the human will in the events of life as these are exhibited in the play of "Hamlet." It represents the abstract and brief chronicle of human life, and, faithfully holding the mirror up to Nature, it teaches—better than all philosophical disquisition and minute introspective analysis can—how is evolved the drama in which human will contends with necessity. Struggle as earnestly and as constantly as he may, the reflecting mortal must feel at the end of all, that he is inevitably what he is; that his follies and his virtues are alike his fate; that there is "a divinity which shapes his ends, rough-hew them as he may." Hamlet, the man of thought, may brood over possibilities, speculate on events, analyze motives, and purposely delay action; but in the end he is, equally with Macbeth, the man of energetic action

whom the darkest hints of the witches arouse to desperate deeds, drawn on to the unavoidable issue. Mighty, it must be allowed, is the power of the human will; that which, to him whose will is not developed, is *fate*, is, to him who has a well-fashioned will, *power;* so much has been conquered from necessity, so much has been taken from the devil's territory. The savage prostrates himself, powerless, prayerful, and pitiable, before the flashing lightning; but the developed mortal lays hold of the lightning and makes of it a very useful servant: to the former, lightning is a fate against which will is helpless; to the latter, will is a fate against which lightning is helpless. What limit, then, to the power of will, when so much of fate is ignorance? The limit which there necessarily is to the contents of the continent, to the comprehended of that which comprehends it. The unrelenting circle of necessity encompasses all: one may go his destined course with tranquil resignation, and another may fume, and fret, and struggle; but, willing or unwilling, both must go. As the play of "Hamlet" so instructively teaches, notwithstanding all the ingenious refinements of a powerful meditation, the human will is included within the larger sphere of necessity or natural law. The cage may be a larger or a smaller one, but its bars are always there. "Where wast thou when I laid the foundations of the earth? Canst thou bind the sweet influences of Pleiades, or loose the bands of Orion? Canst thou bring forth Mazzaroth in his season? or canst thou guide Arcturus with his sons? Then Job answered and said: 'Behold, I am vile; what shall I answer thee? I will lay mine hand upon my mouth.'" Well, then, is it for him who learns his limitation, to whom the dark horizon of necessity becomes the sunlit circle of duty.

EMANUEL SWEDENBORG.*

Few are the readers, and we cannot boast to be of those few, who have been at the pains to toil through the many and voluminous writings of Emanuel Swedenborg. Indeed, it would not be far from the truth to say that there are very few persons who have thought it worth their while to study him at all seriously; he is commonly accounted a madman, who has had the singular fortune to persuade certain credulous persons that he was a seer. Nevertheless, whether lunatic or prophet, his character and his writings merit a serious and unbiassed study. A madness, which makes its mark upon the world, and counts in its train many presumably sane people who see in it the highest wisdom, cannot justly be put aside contemptuously as undeserving a moment's grave thought. After all, there is no accident in madness; causality, not casualty, governs its appearance in the universe; and it is very far from being a good and sufficient practice to simply mark its phenomena, and straightway to pass on as if they belonged, not to an order, but to a disorder of events that called for no explanation. It is certain that there is in Swedenborg's revelations of the spiritual world a mass of absurdities sufficient to warrant the worst suspicions of his mental sanity; but, at the same time, it is not less certain that there are scattered in his writings conceptions of the highest philosophic reach, while throughout them is sensible an exalted tone of calm moral feeling which rises in many places to a

* *Journal of Mental Science*, No. 70.

real moral grandeur. These are the qualities which have gained him his best disciples, and they are qualities too uncommon in the world to be lightly despised, in whatever company they may be exhibited. I proceed, then, to give some account of Swedenborg, not purposing to make any review of his multitudinous publications, or any criticism of the doctrines announced in them with a matchless self-sufficiency; the immediate design being rather to present, by the help mainly of Mr. White's book, a sketch of the life and character of the man, and thus to obtain, and to endeavor to convey, some definite notion of what he was, what he did, and what should be concluded of him. *

The first condition of fairly understanding and justly appraising any character is to know something of the stock from which it has sprung. For grapes will not grow on thorns, nor figs on thistles; and, if the fathers have eaten sour grapes, the children's teeth will not fail to be set on edge. At the end of all the most subtile and elaborate disquisitions concerning moral freedom and responsibility, the stern fact remains that the inheritance of a man's descent weighs on him through life as a good or a bad fate. How can he escape from his an-

* Emanuel Swedenborg: His Life and Writings. By William White. In two volumes. 1867.—As the present purpose is not to make any criticism of Mr. White's laborious and useful work, I shall not again refer especially to it, although making large use of the materials which it furnishes for a study of Swedenborg; I may once for all commend it to the attention of those who are interested in obtaining an impartial account of the life and works of the prophet of the New Jerusalem. Mr. White does not appear to have formed for himself any definite theory with regard to Swedenborg's pretensions, but is apt, after having told something remarkable of him, to break out into a sort of Carlylian foam of words, which, however, when it has subsided, leaves matters much as they were. Perhaps his book is none the worse for the absence of a special theory, as we get a fair and unbiassed selection from Swedenborg's conversation and writings, and a candid account of the events of his life. At the same time it will obviously be necessary, sooner or later, that the world come to a definite conclusion with regard to his character and pretensions. If man can attain to a gift of seership, and has in him the faculty of becoming what Swedenborg claimed to be, it is surely time that some exact investigation should be made of the nature of the faculty, and that we should set ourselves diligently to work to discover the track of so remarkable a development.

cestors? Stored up mysteriously in the nature which they transmit to him, he inherits, not only the organized results of the acquisitions and evolution of generations of men, but he inherits also certain individual peculiarities or proclivities which determine irresistibly the general aim of his career. While he fancies that he is steering himself and determining his course at will, his character is his destiny. The laws of hereditary transmission are charged with the destinies of mankind—of the race and of the individual.

Swedenborg's grandfather was a copper-smelter, of pious disposition and industrious habits, who had the fortune to become rich through a lucky mining venture. He had a large family, which he counted a blessing; for he was in the habit of saying after dinner, with a humility not perhaps entirely devoid of ostentation: "Thank you, my children, for dinner! I have dined with you, and not you with me. God has given me food for your sake." His son Jasper, the father of Emanuel Swedenborg, exhibiting in early youth a great love of books and a pleasure in playing at preaching, was educated for the ministry, in which, by zealous energy and no small worldly shrewdness, he succeeded so well that he ultimately rose to be Bishop of Skara. He was a bustling, energetic, turbulently self-conscious man, earnest and active in the work of his ministry, and a favorite of the king, Charles XI. Of a reforming temper and an aggressive character, with strongly-pronounced evangelical tendencies, by no means wanting in self-confidence or self-assertion, and indefatigable in the prosecution of what he thought to be his duties, he did not fail to make enemies among those of his brethren who were unwilling to have the sleepy routine of their lives disturbed; but by the energy of his character and the favor of the king he held his own successfully. "I can scarcely believe," he says, "that anybody in Sweden has written so much as I have done; since, I think, ten carts would scarcely carry away what I have written and printed at my own expense, yet there is as much, verily, there is

nearly as much, not printed." Certainly he was not less keenly careful of the things that concerned his temporal well-being than of those that belonged to his eternal welfare; and, deeming himself a faithful and favored servant of the Lord, he easily traced in all the steps of his advancement the recompensing hand of his Divine Master. "It is incredible and indescribable," he exclaims, when made Dean of Upsala, "what consolation and peace are felt by the servants of the Lord when raised to a high and holy calling; and contrariwise how down-hearted they must be who experience no such elevation." Without doing any injustice to the zealous bishop, we may suppose that certain worldly advantages contributed their measure to the consolation which he felt in being raised to so high and holy a calling. By the death of his wife he was left a widower with eight children, the eldest of them not twelve years old; but he soon took to himself a second wife, distinguished for her "piety, meekness, liberality to the poor," and who was moreover "well-off, good-looking, a thrifty housewife, and had no family." She died, and within a year after her death he married for the third time, being then in his sixty-seventh year. "My circumstances and my extensive household required a faithful companion, whom God gave me in Christina Arhusia." In his choice of wives, as in other matters, he evinced his shrewd and practical character, acting apparently in accordance with the advice which he gives in a letter to his youngest son, whom he was urging to apply himself to work: "You write well, you reckon well, and, thank God, you are not married. See that you get a good wife, *and something with her.* Pray God to lead you in his holy way." The mixture of piety and worldly wisdom is very characteristic of the bishop.

His sublime self-assurance was a most striking feature in his character. Assuredly he never lacked advancement either for himself or his family through any modest distrust of his worth or any hesitation to urge his claims; he was, indeed, most pertinacious in his petitions to the king, in sea-

son and out of season; and, if his prayer was left unnoticed, another was sure to follow in a short time, so that the only way of getting rid of his importunities was to grant something of what he asked. It is only just to him to add, however, that he was not less urgent in his petitions for the advantage of the Church than he was in his petitions for his own advantage. So great was the faith which he had in himself and in the efficacy of his prayers that he was persuaded that he actually worked miraculous cures of disease. "There was," he says, "brought to me at Starbo a maid-servant named Kerstin, possessed with devils in mind and body. I caused her to kneel down with me and pray, and then I read over her, and she arose well and hearty and quite delivered." To this same seemingly hysterical servant, who on one occasion lay senseless and half suffocated, he called in a loud voice, "Wake up, and arise in the name of Jesus Christ!" Immediately she recovered, got up, and commenced to talk. Another of his servants had a dreadful pain in her elbow, which nothing relieved, so that for days and nights she went about moaning without rest or sleep. "At midnight she came to the room where I was lying asleep with my beloved wife, and prayed that I would for the sake of Christ take away her pain, or she must go and kill herself. I rose, touched her arm, and commanded the pain in the name of Jesus Christ to depart, and in a moment the one arm was as well as the other. Glory to God alone!" Not a doubt seems to have ever ruffled the serenity of his self-complacency; he had the comfortable conviction, which men of his narrow and intense type of mind sometimes get, that in all his doings the Lord was on his side. When he was nearly eighty years of age he composed his autobiography, making with his own hand six copies of it, and dedicating them "to my children and posterity as an example how to conduct themselves after my death." The grave should not quench his shining light; he was resolved, being dead, yet to speak. Of his autobiography or of any other of his cart-loads

of writings it is not probable that posterity will ever care to read much; the good which the restless and indefatigable bishop conferred on the world was done by his energetic and useful life; he worked well and wisely for his generation, and his generation liberally rewarded him.

Such, then, was Bishop Swedenborg, whose second son, Emanuel, was born on the 29th of January, 1688, and was so named that he might be "thereby reminded continually of the nearness of God." Of his mother we know nothing more than what the bishop writes of her: "Although she was the daughter of an assessor, and the wife of a rector in Upsala, and of a wealthy family, she never dressed extravagantly. As every woman in those days wore a sinful and troublesome *fontange* or top-knot, she was obliged to do as others did and wear it; but hearing that a cow in the island of Gothland had, with great labor and pitiable bellowing, brought forth a calf with a top-knot, she took her own and her girl's hoods and threw them all into the fire; and she made a vow that she and her daughters, as long as they were under her authority, should never more put such things on their heads."

The story, notwithstanding the superstition which it discovers, indicates strong self-reliance and no little force of character, but is hardly sufficient to warrant any special conclusions. As, however, Swedenborg's intellect was undoubtedly of a higher order than his father's, by nature far more subtile, comprehensive, and powerful, it is probable that he owed much to his mother's stock, as is so often the case with men of distinction. It is a small matter for any one to have had a clever father if he has had a foolish mother. The transmission of his father's qualities of character certainly could not have been an unmixed benefit, some of them having been evidently already strained as far as was consistent with the maintenance of a sound equilibrium. A man whose intellect moved in so narrow a current, who was possessed with such wonderful self-assurance, and who sincerely be-

lieved that he worked miraculous cures, was not unlikely to have a son in whom the exaggeration of these characters passed the limits of sanity. At any rate we may believe that the busy bishop had but little reserve power to communicate to his children, having needed and used all the force which he had for the manifold projects and works of his own active and demonstrative life; he put forth too many blossoms himself to leave much force in his stock available for the next generation. To the quiet, self-reliant, and self-denying energy of his mother's character it may well be that Swedenborg was more indebted than to the too self-conscious activity of his father.

Of the events of his childhood and early youth nothing more is known than what he himself, writing in his old age, tells us:

"From my fourth to my tenth year, my thoughts were constantly engrossed in reflecting on God, on salvation, and on the spiritual affections of man. I often revealed things in my discourse which filled my parents with astonishment, and made them declare at times that certainly the angels spoke through my mouth.

"From my sixth to my twelfth year, it was my greatest delight to converse with the clergy concerning faith, to whom I observed that 'charity or love is the life of faith'"—

and other wonderfully precocious things.

We shall be the more apt to believe that he did discourse in that strange way, if we bear in mind that he was bred, and lived, and moved in an atmosphere of religious talk and theological discussion, where Providential interferences were not wanting. The endless praying, the catechizing, the sermonizing of his father, and the parental admiration which his own childish discourse excited, would tend to engender a precocity in religious matters, which failed not to bear its natural fruits in his subsequent life. From this brief glimpse into the nature of his early training, we perceive sufficient reason to conclude that the extreme self-confidence which he inherited from his father met with a fostering applause rather

than a prudent discouragement. Unquestionably, if at that early age his thoughts were constantly engrossed in reflections on God, and his mouth had become an organ through which angels spoke, both his thoughts and his mouth might have been much better employed.

A notable peculiarity which he asserts to have distinguished him in his early years, and made him unlike other children, was a power of almost suspending his breathing; when deeply absorbed in prayer, he hardly seemed to breathe at all. Another remarkable characteristic of the wonderful child! On it he subsequently founded important theories concerning respiration, and his disciples look upon it as connected with the power which he claimed to have of entering the spirit-world while still in the flesh. A more commonplace explanation, however, may easily suggest itself. Physicians who are accustomed to be consulted about children of nervous disposition, predisposed to epilepsy or insanity, will call to mind instances in which the little beings have fallen into trances or ecstasies, and spoken in voices seemingly not their own. On the one hand, these seizures pass by intermediate steps into attacks of chorea, and, on the other hand, they may alternate with true epileptic fits, or pass gradually into them. So far from being conditions to admire, they are of dangerous omen, and the parent whose child is so afflicted, whether it be by airs from heaven or blasts from hell, would do well to take him to some physician, in order to have the angels or devils exorcised by medical means. If Swedenborg's youthful ecstasies, as seems not improbable, were of this character, his father, who thought his hysterical maid-servent to be possessed with "devils in mind and body," was not likely to interpret them rightly; on the contrary, like Mohammed's epileptic fits, they would be counted visitations of the Deity.

Thus much, and it is unfortunately not much, concerning Swedenborg's parentage, childhood, and early training. Scanty as the account is, we may see reason to trace in some events

of his life the effects of the influences then exerted. I go on now to mention briefly what is known of his youth and early manhood. He was educated at the University of Upsala, where he took the degree of Doctor of Philosophy at the age of twenty-one. Afterward he travelled abroad in order to complete his studies, remaining some time in London, Paris, and Hamburg, wherever he went evincing an earnest thirst for knowledge, and seeking and obtaining the acquaintance of men eminent in mathematics, astronomy, and mechanics. Returning from his travels, he took up his abode for some years in the little sea-side university town of Griefsvalde, where he certainly was not idle. In a letter to his brother-in-law, he specifies as many as fourteen wonderful mechanical inventions on which he was engaged. Among these were:

The construction of a sort of ship in which a man may go below the surface of the sea, and do great damage to the fleet of an enemy.

A machine, driven by fire, for pumping water, and lifting at forges where the water has no fall.

A new construction of air-guns, by which a thousand balls may be discharged through one tube in one moment.

Schiographia universalis, or a mechanical method of delineating houses of every kind, and on any surface, by means of fire.

A mechanical chariot containing all kinds of tools, which are set in action by the movements of the horses.

A flying chariot, or the possibility of floating in the air and moving through it.

The number of projects on which he was engaged shows how great was his industry, and how fertile his ingenuity, while the character of them proves that there was no hinderance to a habit of ambitious speculation in any modest distrust of his own powers. It is evident, too, that at this period of his life his speculations were directed to practical ends;

his daring flights were made from a basis of scientific facts, and aimed at some directly useful result; he was not yet, at any rate, a mere dreamer of inflated dreams. What, however, is particularly significant is the entire absence of self-restraint in these intellectual projects: there is no problem which he does not hold to be penetrable, and penetrable by him. To what end must such a lofty and high-aspiring spirit inevitably come unless it learn by sad experience soberly to define its aims and definitely to work for them? Icarus-like in its aspiring ambition, it cannot but be Icarus-like in its disastrous fall.

In 1715, when he was twenty-seven years old, he returned home, and received before long from the king, in compliance with his father's pertinacious prayers, the appointment of assessor in the Royal School of Mines, where, as assistant to Polhem, an eminent engineer, he was usefully employed in the practical work of his office. At the same time he did not abandon his ingenious and abstruse speculations; the results of his labors being published in numerous pamphlets, the titles of some of which will serve to indicate the nature of his studies. One is entitled "Attempts to find the Longitude by means of the Moon;" another, "On the Level of the Sea and the Great Tides of the Ancient World;" another, "A Proposal for the Division of Money and Measures so as to facilitate Calculation and Fractions." His brother-in-law Benzelius having discouraged this last scheme as impracticable and advised him to relinquish it, he replies bravely:

"It is a little discouraging to be dissuaded thus. For myself, I desire all possible novelties, ay, a novelty for every day in the year, provided the world will be pleased with them. In every age there's an abundance of persons who follow the beaten track, and remain in the old way; but perhaps there are only from six to ten in a century who bring forward new things founded on argument and reason."

A novelty for every day in the year by all means, provided it be a novelty which has some solidity of foundation and a reasonable chance of bearing the test of verification. But

to pursue novelties for novelty's sake, to disdain the beaten track merely because it is beaten, and to leap out of it, for the purpose of showing independence—these are things which are likely in no long time to bring a man to considerable intellectual grief. A habit of excogitating vague and hypothetical plausibilities is not difficult of acquirement, but is very detrimental to exact observation and sound reasoning. There is commonly greater profit, though attended with more pains and less pleasure, in scrutinizing and scrupulously testing one good theory than in putting forth a hundred empty hypotheses; self-restraint being a far higher energy than self-abandonment. It is plain that Swedenborg had, to a degree which few persons have had, the power of seizing distant analogies, but it is equally plain that he put no restraint on the exercise of this faculty. No wonder that the world, unapt to welcome warmly any new doctrine, apt indeed to shut the door resolutely in its face, did not receive his wonderful discoveries with the gratitude and interest which he imagined to be their due, but, on the contrary, went on in its prosaic way serenely disregardful of them.

Writing to Benzelius, he complains that his brother-in-law has estranged his dear father's and mother's affections from him, and that his speculations and inventions find no patronage in Sweden.

"Should I be able to collect the necessary means, I have made up my mind to go abroad and seek my fortune in mining. He must indeed be a fool, who is loose and irresolute, who sees his place abroad, yet remains in obscurity and wretchedness at home, where the furies, Envy and Pluto, have taken up their abode, and dispose of all rewards, where all the trouble I have taken is rewarded with such shabbiness!"

Again:

"I have taken a little leisure this summer to put a few things on paper, which I think will be my last productions, for speculations and inventions like mine find no patronage nor bread in Sweden, and are considered by a number of political blockheads as a sort of school-boy exercise, which ought to stand quite in the background, while their finesse and intrigues step forward."

In what way his father's affections had shown themselves estranged we do not learn. Perhaps the bustling bishop had become impatient of his son's multitudinous speculations, and was urging him to some more practical work; for he was not apt to look complacently on any neglect of the things that lead to worldly prosperity. To another of his sons he writes on one occasion: "See that you find some occupation where you are. It is no use to be in Sweden to fritter away your best days in idleness."

Notwithstanding the little favor which his inventions met with, Swedenborg did not carry into effect the resolution to abandon his ungrateful country; he contented himself with a tour of fifteen months on the Continent, visiting Amsterdam, Leipsic, Liége, and Cologne. During this period he continued to publish numerous pamphlets, one of which was on "New Attempts to explain the Phenomena of Physics and Chemistry by Geometry," and another on "A New Method of finding the Longitude of Places on Land or at Sea by Lunar Observations." Observing as he travelled, and reflecting on what he observed, he at once published the fancies and speculations with which his prolific mind teemed; and so serene was his self-assurance that he never seems to have doubted his capacity to deal off-hand with the most difficult subjects. Swiftly and recklessly his imagination passed to its conclusions through faint gleams of analogies, leaving deliberation and verification hopelessly in the rear, if they were ever thought of at all. He returned to Sweden in 1722, and during the next twelve years—from his thirty-fourth to his forty-sixth year—he preserved an unaccustomed silence, for he published nothing. He was, however, far from idle; the time which was not occupied in the duties of his assessorship being devoted to study and to the composition of three big folios—the "Principia," containing an account of the creation of matter, and the "Opera Philosophica et Mineralia." These were published at Leipsic in 1734.

In his "Principia" he professes to investigate the Ele-

mental Kingdom, the subtile and intangible particles of which, each having its own powers of elasticity and motion, combine, as he assumes, to constitute an element. But how does he get at any knowledge of these subtile particles which he postulates? By reasoning from analogy. The method of Nature, he says, is everywhere the same; Nature is similar to herself in Suns and Planets as in Particles; size makes no difference; there is the same ratio between 1,000,000 and 5,000,000 as there is between ·0,000,001 and ·0,000,005; what is true of the least is true of the greatest. Now, as the whole world is mechanical, these intangible particles must be so also; visible matter is geometrical as to figure, mechanical as to motion; therefore invisible matter must be so also. Then he goes on to argue in an elaborate way that every thing in Nature originated in a point—just as the origin of lines and forms in geometry is in points—itself somehow produced immediately from the Infinite, and that from a congress of points the First Finite was produced; from an aggregation of First Finites a grosser order of Second Finites; from these an order of Third Finites; and so on until the earth and all that therein is was produced. How he contrives to get his point produced from the Infinite, and then to start it on such a wonderful career, it is impossible to explain; his disciples, who discover in some parts of these barren speculations the anticipations of important scientific discoveries, and perceive everywhere the marks of a superhuman philosophic insight, do not furnish an intelligible interpretation. This is not much to be wondered at, seeing that the master himself, when he was subsequently admitted to the Spiritual World, discovered them to be vain and idle fancies. What may justly cause surprise and regret, however, is that his followers should insist on reading a wonderful meaning into what he so entirely discarded, and persist in vaguely extolling, without definitely setting forth, the science which they find so marvellous. The fact which it chiefly concerns us here to note is his infinite self-sufficiency;

there is no arrogant self-assertion, no offensive conceit, but a serene and boundless self-assurance, the like of which is seldom met with outside the walls of an asylum, but is not seldom exhibited by the monomaniac who constructs elaborate theories of the universe out of the troubled depths of his consciousness. When a man plants himself on such a platform, he is certainly likely, "whether owing to the fault or discernment of his contemporaries, to inhabit his intellectual estate unquestioned, unlimited, uncontradicted, and alone." *

The "Philosophical and Mineral Works" contain a very full description of the practical details of mining in different parts of the world; they testify how well he had observed, and how hard he had studied, during his travels. He gives them the title of "Philosophical" advisedly, because it was his aim to wed philosophy to science, and to rise by steps from the investigation of the mineral to that of the organic kingdom, and through this to the study of man, and of human mind as the crowning achievement of organization.

"Man did not begin to exist until the kingdoms of Nature were completed, and then the world of Nature concentrated itself in him at his creation. Thus in man, as in a microcosm, the whole universe may be contemplated from the beginning to the end, from first to last."

There is nothing original in this conception, which is indeed as old as thought; but, if we err not, the conception of the method by which Swedenborg resolved to ascend step by step from the knowledge of the lowest forms of matter to the knowledge of its highest forms, until at last he penetrated into the secret chamber of that "noblest organization in which the soul is clad," was at that time as original as it was profoundly scientific. The grand end which he proposed to himself was the discovery of the soul; to the investigation of its nature he would mount through the different organs and functions of the body, using his knowledge of them as a ladder by which to ascend into "her secret chambers, open

* Dr. Garth Wilkinson's "Biography of Swedenborg," p. 27.

all the doors that lead to her, and at length contemplate the soul herself." How different in this regard from learned metaphysicians, who deem an entire ignorance of the body no bar to the most dogmatic disquisition concerning mind! Who can withhold admiration of the noble ambition of his design, of the resolute determination to undertake so vast a work, of the unflinching industry with which he set himself to execute it? It is meet that criticism stand respectfully aside for a moment, and do free homage to the philosophic genius of the mind which was capable at that time of conceiving so truly scientific a method, and of the resolution to accomplish its application.

In pursuance of his great scheme of penetrating from the very cradle to the maturity of Nature, he determined to undertake earnestly the study of anatomy and physiology, having inherited at his father's death, which took place in 1735, a sufficient fortune to enable him to follow the bent of his inclinations. Accordingly, he started once more for a tour on the Continent, visiting Brussels, Paris, Turin, Milan, Venice, and Rome, occupying himself in the study of anatomy, and amusing himself with visiting the theatres and operas, and seeing what was worth seeing in the different towns. For he was no ascetic, though he lived a solitary life: he was evidently not insensible to certain lusts of the flesh, nor sparing of the gratification of them; we learn incidentally that in Italy, though he was now fifty-two years old, he kept a mistress, as indeed he had formerly done in Sweden. At a later period of his life we find him telling in his Diary how he wondered much "that I had no desire for women, as I had had all through my life," and again, "How my inclination for women, which had been my strongest passion, suddenly ceased." Very meagre, however, are the indications of the way in which he spent his time; it would seem that he visited the dissecting-rooms, if he did not himself dissect; he certainly made himself acquainted with the works of the best anatomists, transcribing from their pages the descrip-

tions suited to his purposes; and in one way or another seven years were passed by him in travelling about and in physiological studies.

In 1741 he gave to the world the results of his studies and reflections in anatomy by publishing at Amsterdam his "Economy of the Animal Kingdom," which was followed in 1744 by his "Animal Kingdom." These works were the continuance of his great design in the region of organization. In them he made use of the writings of the best anatomists, selecting their descriptions as the basis of facts on which he founded his reflections.

"Here and there I have taken the liberty of throwing in the results of my experience, but this only sparingly; for, on deeply considering the matter, I deemed it better to make use of the facts supplied by others. Indeed, there are some that seem born for experimental observation, and endowed with a sharper insight than others, as if they possessed naturally a finer acumen; such as Eustachius, Ruysch, Leeuwenhoek, Lancisi, etc. There are others, again, who enjoy a natural faculty for contemplating facts already discovered, and eliciting their causes. Both are peculiar gifts, and are seldom united in the same person. Besides, I found when intently occupied in exploring the secrets of the human body, that as soon as I discovered any thing that had not been observed before, I began (seduced probably by self-love) to grow blind to the most acute lucubrations and researches of others, and to originate a whole series of inductive arguments from my particular discovery alone; and consequently to be incapacitated to view and comprehend, as accurately as the subject required, the idea 'of universals in individuals, and of individuals under universals.' I therefore laid aside my instruments, and, restraining my desire for making observations, determined rather to rely on the researches of others than to trust to my own."

Still he was not ignorant of the dangers which beset ratiocination when divorced from experience.

"To a knowledge of the causes of things nothing but *experience* can guide us; for, when the mind, with all the speculative force which belongs to it, is left to rove about without this guide, how prone it is to fall into error, yea into errors and errors of errors! How futile it is after this, or at any rate how precarious, to seek confirmation and

support from experience! We are not to deduce experience from assumed principles, but to deduce principles themselves from experience; for in truth we are surrounded with illusive and fallacious lights, and are the more likely to fall because our very darkness counterfeits the day. When we are carried away by ratiocination alone, we are somewhat like blindfolded children in their play, who, though they imagine they are walking straightforward, yet when their eyes are unbound, plainly perceive that they have been following some roundabout path, which, if pursued, must have led them to the place the very opposite to the one intended."

Wise words! but how far Swedenborg was from realizing them in practice, the perusal of a single page of his treatise will suffice to prove. His nature was too strongly bent on speculation to allow him to brook any restraint on the flights of his restless and aspiring intellect, and, when experience left gaps, his imagination never hesitated to fill them up with theories; the very facts, indeed, which he professes to record are frequently so tinged with his own hypotheses as to be made unreliable, while they are almost always too weak to bear the large conclusions which he bases upon them. One thing, however, which distinguishes him prominently from most, if not all, of those who have written upon anatomy and physiology, and which is indeed the outcome of his large and philosophic intellect, is the clear and excellent conception which he evinces of the organism as a living social unity, formed by the integration of manifold orderly-disposed parts: he does not treat of the body as if it were a mere mechanism or carcass of muscle, bone, and nerve, to be carefully observed, dissected, and described or figured; nor does he deal with the functions of an organ as if it were an independent agent, and had little or no concern or relation with other organs, and with the whole life of the being; throughout his treatise he grasps the idea of a vital harmony, exhibits the essential interdependence, the orderly subordination and coördination of parts, and brings us face to face with a *living organization*. To him there is no manifestation of the bodily life, however seemingly humble, which has not its deep meaning; every

thing which is outwardly displayed is symbolical of what exists in the innermost. It plainly appears that his science of the bodily organism, fanciful as it often seems, is animated with conceptions derived from the social organization; and although the latter is a later, higher, and more complex human evolution than the bodily organization, it is certain that ideas obtained in its sphere may be profitably applied to the study of the life of the body. If in one wonderful flash of self-consciousness the intimate functions and relations of every part of the body, and their integration in the unity of the *ego*, were miraculously declared, who can tell, nay, who can imagine, what a flood of light would be suddenly thrown upon the social relations of man?

It would be unprofitable to attempt to give here a summary of Swedenborg's physiological views; indeed, it would be impossible to make an abridgment of them: among numerous wild conjectures, fanciful theories, strange conceits, and empty phrases, there are many pregnant suggestions, gleams of the most subtile insight and far-reaching analogies illuminating the dry details with light from a higher sphere. When he has gone astray, it might sometimes be justly said of him that "the light which led him astray was light from heaven." Doubtless it is an admiration of this higher intellectual light which has inspired Emerson's extraordinary estimate of his genius. He speaks of him as one who "seemed, by the variety and amount of his powers, to be a composition of several persons—like the giant fruits which are matured in gardens by the union of four or five single blossoms;" "who anticipated much science of the nineteenth century; anticipated in astronomy the discovery of the seventh planet; anticipated the views of modern astronomy in regard to the generation of the earth by the sun; in magnetism, some important conclusions of later students; in chemistry, the atomic theory; in anatomy, the discoveries of Schlichting, Munro, and Wilson; and first demonstrated the office of the lungs."

"A colossal soul, he lies abroad on his times, uncompre-

hended by them, and requires a long focal distance to be seen; suggests, as Aristotle, Bacon, Selden, Humboldt, that a certain vastness of learning, or *quasi* omnipresence of the human soul in Nature, is possible. . . . One of the mastodons of literature, he is not to be measured by whole colleges of ordinary scholars. His stalwart presence would flutter the gowns of a university. Our books are false by being fragmentary; their sentences are *bon mots*, and not parts of natural discourse, or childish expressions of surprise and pleasure in Nature. But Swedenborg is systematic, and respective of the world in every sentence: all the means are orderly given; his faculties work with astronomic punctuality; and his admirable writing is pure from all pertness or egotism."

These must appear strange and startling assertions to those who have considered deeply the slow and tedious course of scientific discovery, and they would be more strange if they were true; but the sober fact is, that there is scarcely a shadow of reason for attributing to him any of these wonderful discoveries. He speculated largely and vaguely about magnetism, chemistry, astronomy, anatomy, as he did about every thing else, and expressed what he thought with an unequalled self-sufficiency; but, if his speculations in these sciences be compared with such exact knowledge of them as existed at the time, his information will be found to be superficial and defective, his speculations for the most part crude, barren, and fanciful. In regard to this question, it should be borne in mind that Swedenborg did not live and flourish in the thirteenth but in the eighteenth century; that he was contemporary with Newton and Halley in science, with Berkeley, Hume, and Kant, in philosophy. It is really only by throwing him back, as it were, into the dark ages, by ignoring the intellectual development of his time, and looking on his writings as the Mussulman looks on his Koran, that it is excusable to break out into any admiration of his positive scientific acquirements. That the world received his publications with indifference was the natural and just consequence

of their character; it would, indeed, have been remarkable if men seriously engaged in scientific work had thought it worth while to examine and controvert his fanciful opinions. Vain and futile, too, would the attempt assuredly have been if it had been made, for sober inquiry could not meet on a common platform with imagination run riot and self-confidence incapable of doubt.

It would be useless, then, to attempt to convey an adequate notion of the matter of Swedenborg's writings; it must suffice here to note their intellectual character. Undoubtedly he possessed in a remarkable degree some of the elements of greatness which have existed in the greatest men: a wonderful originality of conception; a mind not subjugated by details and formulas, but able to rise above the trammels of habits and systems of thought; an extraordinary faculty of assimilation; a vast power of grasping analogies; a sincere love of knowledge; an unwearied industry and a matchless daring. Having all these qualities, but entirely lacking intellectual self-restraint, he is scientifically as sounding brass or a tinkling cymbal: his originality unchecked degenerated into riotous fancy; his power of rising above systems passed into a disregard or disdain of patiently-acquired facts; though his industry was immense, he never more than half learned what he applied himself to, never patiently and faithfully assimilated the details of what was known, but, seduced by his love of analogies and sustained by his boundless self-sufficiency, he was carried away into empty theories and groundless speculations. He was unwisely impatient of doubt, constitutionally impatient of intellectual self-control. His writings, though containing many truths excellently illustrated, and passages of great pregnancy and eloquence, are diffuse, and very tedious to read; they have neither beginning nor end, are full of repetitions, inconsistencies, and even contradictions. His admirers may see in such contradictions the evidence of a persevering and single-minded pursuit of truth, by reason of which he scrupled not to abandon an

opinion so soon as he discovered a wider horizon; but it is plainly also possible to discern in them the evidence of an ill-balanced intellect drifting from all real anchorage in observation and experience. Toward the end of the "Principia" he says:

"In writing the present work I have had no aim at the applause of the learned world, nor at the acquisition of a name or popularity. To me it is a matter of indifference whether I win the favorable opinion of every one or of no one, whether I gain much or no commendation; such things are not objects of regard to one whose mind is bent on truth and true philosophy; should I, therefore, gain the assent or approbation of others, I shall receive it only as a confirmation of my having pursued the truth. . . . Should I fail to gain the assent of those whose minds, being prepossessed by other principles, can no longer exercise an impartial judgment, still I shall have those with me who are able to distinguish the true from the untrue, if not in the present, at least in some future age."

That he was sincere in this serenely complacent declaration is proved by the calm, passionless tone of his writings, and by the steady, unruffled pursuit of his own line of thought in so many fields of labor. But no man is self-sufficing in this universe, and it is an irremediable misfortune to him when he imagines that he is. A due regard to the views and opinions of others is not merely useful, but indispensable to a sound intellectual development; furnishing, as these do, a searching test whereby true theories are separated from those which are false, the former ultimately verified and accepted, and the latter rejected. Truth is not born with any one man, nor will it die with him; its progress resting on the development of the race in which the greatest of individuals has but a very small part. To profess an entire indifference to the opinions of contemporaries is not therefore a mark of wisdom, but an indication either of foolish pretence, or of inordinate vanity, or of downright madness, and shows a pitiful ambition in him who makes such a declaration. How many defective theories have been promulgated, how much labor has been vainly spent, because scien-

tific inquirers have not always set themselves conscientiously to work to learn what has been done by others before they began their studies, and how their results stand in relation to well-established truths! The monomaniac who industriously wastes his ingenuity in the construction of a machine which shall be capable of perpetual motion is, in his own estimation, a most earnest pursuer of truth, and at all events has a most sincere indifference to the criticisms of others. In all the world who more original than he?

While we are constrained, then, to pronounce Swedenborg's treatment of scientific subjects often shallow, vague, and fanciful, and for the most part barren of exact knowledge and sound principles, it must be allowed that it is characterized by a comprehensive grandeur of method—a method informed throughout with the truth which Bacon earnestly insisted on, that all partitions of knowledge should be accepted rather "for lines to mark and distinguish than for sections to divide and separate, so that the continuance and entirety of knowledge be preserved." He drew large and inspiring draughts from the fountain of all sciences—the "Philosophia Prima," tracing with subtile insight "the same footsteps of Nature treading or printing upon several subjects or matters." Hence his works are profitable for instruction and correction to all men who are engaged in special branches of scientific research, and whose minds are apt to be fettered by the methods and formulas to which their special science has been reduced, and according to which they have studied and worked, who have, as Bacon says, "abandoned universality, or philosophia prima. For no perfect discovery can be made upon a flat or level: neither is it possible to discover the more remote and deeper parts of any science, if you stand but on a level of the same science, and ascend not to a higher science." Beyond the principles of each science there is a philosophy of the sciences; beyond the artificial and sometimes ill-starred divisions which men for the sake of convenience make, there is a unity of Nature. The principles of

one science, fully comprehended, are a key to the interpretation of all sciences; they are the same footsteps of Nature treading upon several subjects. How mischievously has the human mind been enslaved by the fetters which itself has forged! Is not the most exalted imagery of the true poet fundamentally the highest science? And shall not a philosophy of science be found the highest poetry?

We must now pass to a period of Swedenborg's life when a great change took place in his views, his work, and his pretensions. Hitherto his speculations had preserved a scientific semblance; they had been made from some basis of facts, and had evinced some practical tendency, although the speculations went on increasing out of proportion to the facts, until these became little more than the occasions of theories. Now he abandoned the ground of experience entirely, and entered the spiritual world. His subsequent career as seer and theologian was the natural development of his character, but it was a morbid development; and the history which remains to be told is the history of a learned and ingenious madman, the character of whose intellectual aberration testifies to the greatness of his original intellectual structure.

The manner of the great change by which Swedenborg imagined that his eyes were opened to discern what passed in the world of spirits, and that he was chosen by God to unfold the spiritual sense of the Holy Scriptures, was in this wise: One night in London, after he had dined heartily, a kind of mist spread before his eyes, and the floor of his room was covered with hideous reptiles such as serpents, toads, and the like.

"I was astonished, having all my wits about me, and being perfectly conscious. The darkness attained its height and then passed away. I now saw a man sitting in the corner of the chamber. As I had thought myself entirely alone, I was greatly frightened when he said to me, 'Eat not so much.' My sight again became dim, and when I recovered it I found myself alone in the room."

The following night the same thing occurred.

"I was this time not at all alarmed. The man said, 'I am God, the Lord, the Creator and Redeemer of the world. I have chosen thee to unfold to men the spiritual sense of the Holy Scripture. I will myself dictate to thee what thou shalt write.'"

Thenceforth he abandoned all worldly learning and labored only in spiritual things; the Lord had opened the eyes of his spirit to see in perfect wakefulness what was going on in the other world, and to converse, broad awake, with angels and spirits. Such is his description of the vision in which the scales fell from his eyes and he was called, like the Apostle of the Gentiles, to a new and spiritual mission. What will the ordinary reader say of it? Without doubt one of two things: either that it was a nightmare engendered by indigestion following too heavy a meal, or that it was the hallucination of a disordered brain. The former might seem a probable and sufficient explanation, were it not for some important information which exists with regard to Swedenborg's mental condition at the time. In 1858 a Diary kept by him between 1743 and 1744 was discovered and purchased for the Royal Library at Stockholm. It contains tedious and wearisome records of the dreams which he dreamed night after night, and the spiritual interpretations which he gave to them. They are of all sorts, running through the gamut from the lowest note of despair to the highest pitch of exaltation; some are ecstatic visions of bliss in which he feels himself in heaven; others are distressing visions of temptations, persecutions, and sufferings; while others are filthy details of obscenities. The following dream—if it were not really an epileptic trance—occurred in the night between the 6th and 7th of April, 1744:

"I went to bed. . . . Half an hour after I heard a tumbling noise under my head. I thought it was the Tempter going away. Immediately a violent trembling came over me from head to foot with a great noise. This happened several times. I felt as if something holy were over me. I then fell asleep, and about 12, 1, or 2, the tremblings and the noise were repeated indescribably. I was prostrated on my face, and at that moment I became wide awake and perceived

that I was thrown down, and wondered what was the meaning. I spoke as if awake, but felt that these words were put into my mouth:

"'Thou Almighty Jesus Christ, who by Thy great mercy deigns to come to so great a sinner, make me worthy of Thy grace.'

"I kept my hands together in prayer, and then a hand came forward and firmly pressed mine. I continued my prayer, saying:

"'Thou hast promised to have mercy upon all sinners; Thou canst not but keep Thy word.'

"At that moment I sat in His bosom, and saw him face to face. It was a face of holy mien and altogether indescribable, and He smiled so that I believe His face had indeed been like this when He lived on earth. . . .

"So I concluded it was the Son of God Himself, who came down with the noise like thunder, who prostrated me on the ground, and who called forth the prayer."

It is plain that he was afflicted with such painfully vivid and intensely real dreams as occur when the reason is beginning to totter, and when it is impossible to distinguish between dreaming and waking consciousness. "I was the whole night, nearly eleven hours," he says on one occasion, "neither asleep nor awake, in a curious trance." Every one must have experienced at some time or another what Spinoza long ago observed, that the scenes of a dream may persist for a time as hallucinations after awakening, and produce a feeling of helplessness or even terror. When the nervous system is prostrated and the threatenings of mental disorder declare themselves, these half-waking hallucinations acquire a distressing reality, and not unfrequently a disgusting or appalling character. While dreams may be considered a temporary insanity, insanity is a waking dream, and there is a border-land in which they are so confounded as to be indistinguishable. This confusion is abundantly exemplified in the records of Swedenborg's dreams and visions at this time:

"I had horrible dreams; how an executioner roasted the heads which he had struck off, and hid them one after another in an oven, which was never filled. It was said to be food. He was a big woman who laughed, and had a little girl with her."

Horrible and impious thoughts often caused him agonies of suffering:

"I had troublesome dreams about dogs, that were said to be my countrymen, and which sucked my neck without biting. . . . In the morning I had horrid thoughts, that the Evil One had got hold of me, yet with the confidence that he was outside of me and would let me go. Then I fell into the most damnable thoughts, the worst that could be."

He is persecuted with sensual dreams on many occasions:

"*April* 26 *and* 27.—I had a pleasant sleep for eleven hours, with various representations. A married woman persecuted me, but I escaped. It signifies, that the Lord saves me from persecution and temptation.

"A married woman desired to possess me, but I preferred an unmarried. She was angry and chased me, but I got hold of the one I liked. I was with her, and loved her; perhaps it signifies my thoughts."

Some of the entries which follow, made in the month of May, are of a very mysterious character; and how much of what they relate may be vision and how much reality, it is impossible to say:

"On the 20th I intended going to the Lord's Supper in the Swedish Church, but, just before, I had fallen into many corrupt thoughts, and my body is in continuous rebellion, which was also represented to me by froth, which had to be wiped away. . . .

"I nevertheless could not refrain from going after women, though not with the intention of committing acts, especially as in my dreams I saw it was so much against the law of God. I went to certain places with Professor Ohlreck. . . . In one day I was twice in danger of my life, so that if God had not been my protector I should have lost my life. The particulars I refrain from describing."

Certain passages in the Diary are of such a character as to be quite unfit for publication, or suitable only for publication in a medical journal; and they are omitted therefore by his biographer.

A person may of course dream extraordinary dreams, and

keep a record of them, without justly incurring the suspicion of any mental derangement. The notable circumstances in connection with Swedenborg's dreamings are the indistinguishable blending of dreams and waking visions, and the entire faith with which he accepts and interprets them as spiritual revelations. As a peculiarly endowed being having gifts which no other man had, and the mission to proclaim the church of a New Jerusalem, which he believed himself to have, he looked upon the wildest and most obscene of his dreams as of mighty spiritual significance; even in the dirtiest details of an unchaste dream he discovers a wonderful spiritual meaning. Had it not been for this spiritual interpretation of his dreams and visions, probably no one would ever have doubted the derangement of his intellect. But what is there which, coming in the name or guise of the spiritual, some persons will not be found to accept? Those, however, who reject angrily the supposition of any unsoundness of mind must admit, if they know any thing of its morbid phenomena, that if he was not at this time fast gliding into madness he imitated exceeding well the character of the incipient stages. But there is no need of conjecture where something like certainty is attainable.

At this period there occurs a break of three weeks in the Diary, the interruption corresponding with what appears to have been a positive attack of acute mania. He was lodging at the house of a person named Brockmer, in Fetter Lane, who, twenty-four years afterward, related the following story to Mathesius, a Swedish clergyman, by whom he was questioned on this subject:

BROCKMER'S NARRATIVE.

"In the year 1744, one of the Moravian Brethren, named Seniff, made acquaintance with Mr. Emanuel Swedenborg while they were passengers in a post-yacht from Holland to England. Mr. Swedenborg, who was a God-fearing man, wished to be directed to some house in London where he might live quietly and economically. Mr. Seniff brought him to me, and I cheerfully took him in.

"Mr. Swedenborg behaved very properly in my house. Every Sunday he went to the church of the Moravian Brothers in Fetter Lane. He kept solitary, yet came often to me, and in talking expressed much pleasure in hearing the Gospel in London. So he continued for several months approving of what he heard at the chapel.

"One day he said to me he was glad the Gospel was preached to the poor, but complained of the learned and rich, who, he thought, must go to hell. Under this idea he continued several months. He told me he was writing a small Latin book, which would be gratuitously distributed among the learned men in the Universities of England.

"After this he did not open the door of his chamber for two days, nor allow the maid-servant to make the bed and dust as usual.

"One evening when I was in a coffee-house, the maid ran in to call me home, saying that something strange must have happened to Mr. Swedenborg. She had several times knocked at his door, without his answering, or opening it.

"Upon this I went home, and knocked at his door, and called him by name. He then jumped out of bed, and I asked him if he would not allow the servant to enter and make his bed. He answered 'No,' and desired to be left alone, for he had a great work on hand.

"This was about nine in the evening. Leaving his door and going up-stairs, he rushed up after me, making a fearful appearance. His hair stood upright, and he foamed round the mouth. He tried to speak, but could not utter his thoughts, stammering long before he could get out a word.

"At last he said that he had something to confide to me privately, namely, that he was Messiah, that he was come to be crucified for the Jews, and that I (since he spoke with difficulty) should be his spokesman, and go with him to-morrow to the synagogue, there to preach his words.

"He continued: 'I know you are an honest man, for I am sure you love the Lord, but I fear you believe me not.'

"I now began to be afraid, and considered a long time ere I replied. At last, I said:

"'You are, Mr. Swedenborg, a somewhat aged man, and, as you tell me, have never taken medicine; wherefore I think some of a right sort would do you good. Dr. Smith is near; he is your friend and mine; let us go to him, and he will give you something fitted for your state. Yet I shall make this bargain with you: if the angel

appears to me and delivers the message you mention, I shall obey the same; if not, you shall go with me to Dr. Smith in the morning.'

"He told me several times the angel would appear to me, whereupon we took leave of each other and went to bed.

"In expectation of the angel, I could not sleep, but lay awake the whole night. My wife and children were at the same time very ill, which increased my anxiety. I rose about five o'clock in the morning.

"As soon as Mr. Swedenborg heard me move overhead he jumped out of bed, threw on a gown, and ran in the greatest haste up to me, with his nightcap half on his head, to receive the news about my call.

"I tried by several remarks to prepare his excited mind for my answer. He foamed again and again, 'But how—how—how?' Then I reminded him of our agreement to go to Dr. Smith. At this he asked me straight down, 'Came not the vision?' I answered 'No; and now I suppose you will go with me to Dr. Smith.' He replied, 'I will not go to any doctor.'

"He then spoke a long while to himself. At last he said: 'I am now associating with two spirits, one on the right hand and the other on the left. One asks me to follow you, for you are a good fellow; the other says I ought to have nothing to do with you, because you are good for nothing.'

"I answered, 'Believe neither of them, but let us thank God, who has given us power to believe in His Word.'

"He then went down-stairs to his room, but returned immediately and spoke, but so confusedly that he could not be understood. I began to be frightened, suspecting that he might have a penknife or other instrument to hurt me. In my fear I addressed him seriously, requesting him to walk down-stairs, as he had no business in my room.

"Then Mr. Swedenborg sat down in a chair and wept like a child, and said, 'Do you believe that I will do you any harm?' I also began to weep. It commenced to rain very hard.

"After this I dressed. When I came down I found Mr. Swedenborg also dressed, sitting in an arm-chair, with a great stick in his hand and the door open. He called, 'Come in, come in,' and waved the stick. I wanted to get a coach, but Mr. Swedenborg would not accompany me.

"I then went to Dr. Smith. Mr. Swedenborg went to the Swedish envoy, but was not admitted, it being post-day. Departing thence, he pulled off his clothes and rolled himself in very deep mud

in a gutter. Then he distributed money from his pockets among the crowd which had gathered.

"In this state some of the footmen of the Swedish envoy chanced to see him, and brought him to me very foul with dirt. I told him that a good quarter had been taken for him near Dr. Smith, and asked him if he was willing to live there. He answered, 'Yes.'

"I sent for a coach, but Mr. Swedenborg would walk, and with the help of two men he reached his new lodging.

"Arrived there, he asked for a tub of water and six towels, and, entering one of the inner rooms, locked the door, and spite of all entreaties would not open it. In fear lest he should hurt himself the door was forced, when he was discovered washing his feet, and the towels all wet. He asked for six more. I went home, and left six men as guards over him. Dr. Smith visited him, and administered some medicine, which did him much good.

"I went to the Swedish envoy, told him what had happened, and required that Mr. Swedenborg's rooms, in my house, might be sealed. The envoy was infinitely pleased with my kindness to Mr. Swedenborg, thanked me very much for all my trouble, and assured me that the sealing of Mr. Swedenborg's chamber was unnecessary, as he had heard well of me, and had me in perfect confidence.

"After this I continued to visit Mr. Swedenborg, who at last had only one keeper. He many times avowed his gratitude for the trouble I had with him. He would never leave the tenet, however, that he was Messiah.

"One day when Dr. Smith had given him a laxative, he went out into the fields and ran about so fast that his keeper could not follow him. Mr. Swedenborg sat down on a stile and laughed. When his man came near him, he rose and ran to another stile, and so on.

"When the dog days began, he became worse and worse. Afterward I associated very little with him. Now and then we met in the streets, and I always found he retained his former opinion."

Mathesius adjoins to his copy this testimony:

"The above account was word by word delivered to me by Mr. Broekmer, an honest and trustworthy man, in the house and presence of Mr. Burgman, minister of the German Church, the Savoy, London, while Swedenborg lived. ARON MATHESIUS.

"STORA HALLFARA, *August* 27, 1796."

Here then is a well-authenticated narrative of an outbreak of acute insanity such as any medical psychologist, acquainted

with what had gone before, might have almost ventured to predict. Some of Swedenborg's admirers have tried eagerly but vainly to impugn the veracity of Brockmer's story, as related by Mathesius; it was not only confirmed by other inquirers, but it accords singularly with the revelations which Swedenborg makes of his mental state in the Diary, and it assuredly bears in its circumstances the evidence of truth. Admitted, as it must be, to be true in its main features, there remains no doubt that Swedenborg was insane at the time when he claimed to have been first admitted to intercourse with the spiritual world. After the acute attack had passed off, as it did in a few weeks, was he perfectly restored, or was he still the victim of a chronic mania or monomania, such as not unfrequently follows acute madness? There were two circumstances in this case which would have prevented an experienced physician from looking forward with hope to an entire recovery. The first was the age of the patient, for Swedenborg was at the time fifty-six years old; and the second was that his madness was not a strange calamity coming on him unexpectedly from without, foreign to his nature, extrinsic, but that it was native to his character, the result of an unsound development of its tendencies—it was a natural, an intrinsic madness. In the former case the *ego*, regaining power, may throw off the intruding affliction and reëstablish itself: in the latter the mania absorbs and becomes the *ego*, wherefore no return to entire sanity is possible. It was not then scientifically probable that Swedenborg would recover; it was, on the contrary, probable that he would suffer for the rest of his life from the monomaniacal form of chronic mania. The few records in his Diary which occur after his acute attack tend to confirm the presumption of a continued derangement.

Thus:

"*July* 1 *and* 2.—There happened to me something very curious. I came into violent shudderings, as when Christ showed me His Divine mercy. The one fit followed the other ten or fifteen times.

I expected to be thrown on my face as before, but this did not occur. At last, trembling, I was lifted up, and with my hands I felt a (human) back. I felt with my hands all along the back, and then the breast. Immediately it lay down, and I saw in front the countenance also, but very obscurely. I was then kneeling, and I thought to myself whether or not I should lay myself down beside it, but this I did not, for it seemed as if not permitted.

"The shudderings came all from the lower parts of my body up to my head. This was in a vision when I was neither waking nor sleeping, for I had all my thoughts about me. It was the inward man separated from the outward that was made aware of this."

What, then, are the conclusions, broadly stated, which we may hold to be thus far established? That in the year 1744 or 1745 Swedenborg suddenly abandoned all his former pursuits and interests; that he claimed to have been then admitted to the spiritual world, and to have the power of talking with angels; that coincidently with this great change and new mission he was writing what an unprejudiced person must affirm to be the product of madness; and, lastly, that he had undoubtedly an acute attack of madness. Is it not reasonable to infer that his new and strange pretensions were the outcome of his madness? Not so, his disciples may perhaps say; for throughout his previous career he had been gradually rising from the earthly to the spiritual; he had mounted step by step from the study of the lowest forms of matter to the investigation of its highest organic evolution; and his new mission was the bright and blessed development, the glorious inflorescence, of a consistent life. No question that it was the natural evolution of his previous intellectual career; a self-sufficiency knowing no bounds had risen to the preposterous pretensions of monomania, and an imagination habitually running riot had at last run mad. To live a life of complete seclusion, to pursue contentedly an individual line of thought, isolated from communion with men, estranged from their doings and interests, is nowise the way to preserve a sound mental equilibrium; it is indeed the sure way to engender a morbid style of thought and feeling,

to lead to a moral or intellectual monomania. Speculative philosophers, impracticable theorists, self-inspired prophets, and other able men unhappily insulated by undue self-esteem, may retire to the solitude of their chambers, and launch forth their systems, their theories, their denunciations, or their scorn; but the greatest men, who have preserved a healthy tone of mind and displayed the highest intellectual energy, have not separated themselves from other men, but have lived in sympathy with them, and have moved and had their being among them. As outward expression of idea is essential to its clearness of conception, so a life of action is essential to the highest life of thought. It is in the social as it is in the bodily organism: the surrounding elements of the structure ever exert a beneficial controlling influence on any element which has taken on an excessive individual action; and if this escape from such modifying influence, its energy runs into disease, and it becomes an excrescence.

In July, 1845, Swedenborg returned to Sweden, and soon afterward resigned his assessorship, so that he might be at liberty to devote himself to the new function to which he imagined that he had been especially called. Accordingly, all scientific studies and pursuits he now abandoned entirely; all worldly honors and interests he counted worthless; he devoted himself to that sacred office "to which the Lord Himself has called me, who was graciously pleased to manifest Himself to me, His unworthy servant, in a personal appearance in the year 1743; to open in me a sight of the spiritual world, and to enable me to converse with spirits and angels. . . . Hence it has been permitted me to hear and see things in another life which are astonishing, and which have never come to the knowledge of any man, nor entered into his imagination. I have been there instructed concerning different kinds of spirits, and the state of souls after death—concerning hell, or the lamentable state of the unfaithful—concerning heaven, or the most happy state of the faithful, and particularly concerning the doctrine of faith, which is

acknowledged throughout heaven." He is well aware that many persons will affirm that such intercourse is impossible, and that it must be mere fancy and illusion on his part, but for all this he cares not, seeing that "he has seen, heard, and had sensible experience" of what he declares:

"I am aware that many who read these pages will believe that they are fictions of the imagination; but I solemnly declare they are not fictions, but were truly done and seen; and that I saw them, not in any state of the mind asleep, but in a state of perfect wakefulness."

And he goes on to declare, calmly and seriously, the fundamental purpose of his high mission—that through him the Lord Jesus Christ made His second advent for the institution of a new church described in the Revelation under the figure of the New Jerusalem.

It must be borne in mind, with regard to these wonderful voyages to the spiritual world, that Swedenborg did not look upon it as totally unlike, far away and distinct from, the natural world of which we have experience—as a country high up above the clouds, where people are continually occupied in doing the reverse of what they had any pleasure in doing on earth, and indeed are altogether so changed in character, habits, and pursuits, that, if they can affirm their identity, they must be very much astonished at themselves. On the contrary, he considered the spiritual world to be the life and cause of the natural world, which corresponded with it throughout.

"The whole natural world corresponds to the spiritual world collectively and in every part; for the natural world exists and subsists from the spiritual world, just as an effect does from its cause. . . .

"Whenever I have been in company with angels, the objects in heaven appeared so exactly like those in the world, that I knew no other than that I was on earth. . . .

"There is so little difference between the life of the spirit and the life of the body that those who have died can hardly realize that a change has been made. . . .

"A man is equally a man after death, and a man so perfectly that

he knows no other than that he is still on earth. He sees, hears, and speaks as on earth; he walks, runs, and sits as on earth; he eats and drinks as on earth; he sleeps and wakes as on earth; he enjoys sexual delights as on earth; in short, he is a man in general and every particular as on earth, whence it is plain that death is a continuation of life, and a mere transit to another plane of being."

All things in heaven, he says, appear to be in place and space exactly as in the world, but all changes of place are effected by the mind. When an angel or spirit desires to go from one place to another, the desire effects its own accomplishment, and he arrives sooner or later, according as he is eager or indifferent. "Approximations in the spiritual world arise from similitudes of mind, and removals from dissimilitudes; and thus spaces are merely signs of inner differences. . . . From this case alone the hells are altogether separated from the heavens."

Now Swedenborg maintained that to him it was given, by the opening of his spiritual sight, to enter the spiritual world and to see what was going on there, while he was still in the natural world; and that so completely that the spirits "knew no other than that I was one of themselves. An experience like mine no one from creation has had." It is not without interest, nor without significance, to observe what a superior position he assigns himself in the spiritual world: he is the seer in heaven as on earth; can see through the angels at a glance and teach them many things, while they in vain attempt to contend with him in argument—are ignominiously worsted if they pretend to do so. The wonder is, how any one can sincerely accept as revelation some of the absurdities and obscenities which he relates, how the nature of many of his spiritual discoveries can fail to destroy faith in his seership. On the theory of his madness, the exalted position which he serenely assumes, his assertion of a correspondence between the spiritual and the natural world, and the character of his revelations, are quite consistent. He lived and moved in the world, and saw it with his bodily

eyes as other persons see it; but his disordered intellect was continually occupied in spiritualistic reflections to which his disordered imagination gave shape; the morbid creations being projected outward and then represented as events of the spiritual world. Formerly he had devoted his energies to scientific speculations, and had elaborated wonderful theories of Nature; now that he had discarded all scientific pursuits, and confined himself entirely to the study and the mystical interpretation of the Scriptures, he framed a more wonderful theory of the spiritual world. His eyes were indeed opened to see what other people could not see, but the gift was nowise so singular as he imagined; every monomaniac being similarly gifted. What to him are space and time, the laws of Nature, the hard-won experience of mankind, the social interests and obligations? He is above law, above criticism, above error—has a divine right to be always right!

In 1749 Swedenborg published the first volume of his "Arcana Cœlestia," the work being completed in eight quarto volumes, the last of which appeared in 1756. Most of this time he appears to have spent in London. It would be vain to attempt to give an adequate idea of the variety of subjects handled by him and of the marvelous experiences which he records; it must suffice to select and present a few illustrations from Mr. White's numerous quotations.

The following are from the "Spiritual Diary." The first of them indicates the disturbed nights which he often had:

"When I was about to go to sleep, it was stated that certain spirits were conspiring to kill me; but because I was secure, I feared nothing, and fell asleep. About the middle of the night I awoke, and felt that I did not breathe from myself, but, as I believed, from Heaven. It was then plainly told me that the whole hosts of spirits had conspired to suffocate me, and as soon as they had made the attempt a heavenly respiration was opened in me, and they were defeated."

Another feature of his troubled state of mind seems to have been a kleptomaniacal tendency:

"I observed that certain spirits often wished to excite me to steal things of small value, such as are met with in shops; and so great was their desire that they actually moved my hand. I ascertained that in the world these spirits had been tradespeople, who by various artifices defrauded their customers, and thought it allowable. Some had been celebrated merchants, at which I wondered. . . . When they were with me, as soon as I saw any thing in shops, or any pieces of money, or the like, their cupidity became manifest to me; for thinking themselves to be me, they urged that I should stretch forth my hand to steal, quite contrary to my usual state and custom."

Hallucinations of taste and smell were not wanting:

"It has sometimes, yea rather often, happened that what had tasted well, has been changed in my mouth to what is nasty, or to another taste. Twice, if I mistake not, sugar tasted almost like salt. A liquid I drank had infused into it a salty taste expressed by the spirits from the juices of the body. . . . The taste of man is thus changed according to the phantasies of the spirits.

The spirits plot to make him commit suicide:

"It was often observed, that when I was in the streets, evil spirits wished to cast me under the wheels of carriages; the effort was, in fact, habitual to them. To-day I noticed particularly that they were in the constant endeavor to do so. I was enabled to perceive that evil spirits made the attempt, and that indeed such mischief is their life.

"There was a certain woman (Sarah Hesselia) who inwardly cherished such an aversion to her parents that she meditated poisoning them. She took into her head that I was willing to marry her, and when she found out that she was mistaken, she was seized with such hatred that she thought of killing me, had it been possible. She died not long afterward.

"Some time before the faculty of conversing with spirits was opened in me, I was impelled to commit suicide with a knife. The impulse grew so strong that I was forced to hide the knife out of sight in my desk.

"I have now discovered that Sarah Hesselia was the spirit who excited the suicidal impulse as often as I saw the knife. From this it may appear that men may be unconsciously infested with spirits who hated them during their life on earth."

It will be observed how Swedenborg, whose sense of right

and wrong was clear and sharp, attributes to wicked spirits the evil impulses and feelings which sprang from his disorder. "It is given to me to know instantly," he says, "the character of spirits, and not to believe that the feelings which they insinuate are my own, as people generally do, who credit themselves with whatever occurs in their minds." Truly, a saving faith, which evidently withheld him from the commission of many an overt act of insanity.

What he writes of the Quakers, of whom his spiritual experience had given him a very bad opinion, may be quoted here, in order to show the kind of filthy imaginings which some persons are content to accept as his spiritual revelations.

"When I awoke in the night, I found in the hair of my head a multitude of very small snakes. It was perceived that Quaker spirits had been plotting against me while I was asleep, but without effect. It was only by their phantasies that they were among my hair where I felt them.

"The secret worship of the Quakers sedulously concealed from the world was made manifest. It is a worship so wicked, execrable, and abominable, that were it known to Christians they would expel Quakers from society, and permit them to live only among beasts.

"They have a vile communion of wives. The women say they are possessed by the devil, and that they can only be delivered if men filled with the Holy Ghost cohabit with them. Men and women sit round a table, and wait for the influx of the spirit. . . . When a woman feels the devil, she selects a man and retires with him," etc., etc.

"It was inquired whether the Quakers engaged in these obscene rites with their daughters and maid-servants, and it was said that they did."

These atrocious and most absurd charges bear on their face the evidence of the sink in which they were engendered; they are the disgusting spawn of a diseased fancy dwelling with a pathological sympathy upon sexual obscenities after sexual power had been exhausted by excesses. There is really no excuse which can be offered for them but the sad excuse of a diseased mind. If his followers be possessed of

some sure canon by which they are able to distinguish such iniquitous assertions from those which they deem unquestionable truths of the spiritual worlds, and to pronounce them errors or hallucinations, they should declare it; for they assuredly rest on the same evidence as the seer's other spiritual revelations, and as the revelations of the monomaniac—the *ipse dixit* of the narrator.

Swedenborg's sublime self-sufficiency comes strongly out in his intercourse with the prophets, apostles, and other distinguished persons whom he meets in the spiritual world; he stands in no sort of awe or reverence of them, hardly shows them common respect. Why, indeed, should he, seeing that he declared himself to have a mission equal to, or higher than, that which any of them had fulfilled? Believing that it was through his instrumentality that the Lord Jesus Christ had made his second advent for the institution of the new church signified by the New Jerusalem in the Revelation, his coming was second only, if it was second, to the first advent. Whether he still had the notion, which during his acute attack of insanity he expressed, that he was actually the Messiah, does not clearly appear; it is certain, however, that he believed the second coming to have taken place in his person, and the reign of the new church to have commenced. He had fulfilled what John had mystically foretold in the Revelation; and had been a witness of the last judgment which took place in the world of spirits in the year 1757. Very characteristic of the placid monomania with which he was afflicted is the manner in which he speaks of those whose life and works placed them in a position of rivalry to him; his serene superiority enables him to discover at a glance the evil passions with which they have been possessed. Observe what he says of David and of Paul: "David is possessed with the lust of being chief in heaven. . . . Persuaded that he was a god, he proclaimed himself one."

It was natural, then, that he should have no kind feeling to Swedenborg:

"When I went to bed, evil spirits formed a design to destroy me, and for this end took measures to call out hell and every malicious spirit. . . . They evoked David also, who appeared before me in a dense cloud."

Assuredly we have a right to wonder how those who accept Swedenborg's claim of a Divine mission contrive to reconcile these revelations of David's character with the character of the "man after God's own heart." It is impossible to accuse Swedenborg of conscious imposture; no impostor would have ventured on gravely making such incredible statements; it follows, therefore, either that David was an impostor, or that Swedenborg was mad. Vague and windy declamation will not obscure the issue; for if the matter be sincerely sounded, it will appear that from the one or the other conclusion there is no escape. After all, the theory of insanity will be found the most acceptable explanation or excuse, seeing that, if it be not admitted, many holy men besides David must be deemed to have been nothing better than impostors. Here is what he says of Paul and his pretensions:

"A certain devil fancied himself the very devil who deceived Adam and Eve. . . . It was given me to hear Paul speaking with him and saying he wished to be his companion, and that they would go together and make themselves gods.

"During my sleep I have been infested by adulterers, and this devil and Paul have lent there aid to my infesters, and so stubbornly held me in an adulterous train of thought that I could scarcely release myself. . . . Hence Paul's nefarious character was made known.

"Paul is among the worst of the apostles, as has been made known to me by large experience. . . . Besides, he connected himself with one of the worst devils, would fain rule all things, and pledged himself to obtain for him his end. It would be tedious for me to write all I know about Paul."

We are not concerned here to vindicate Paul's character, who certainly, though he called himself the least of the apostles, did not undervalue his importance; we are concerned only with the revelation which Swedenborg makes of his own sublime self-sufficiency in heaven as on earth. Luther, hear-

ing of his power while in the natural world to converse with those in the spiritual world, came with others to see him, and asked many questions; learning, however, that the church had come to an end and that a new church had commenced, he grew very indignant; but after a while his railing ceased, and he received the doctrine of the new Jerusalem, and ridiculed his former tenets as in direct opposition to the Word. Calvin is in like manner refuted by Swedenborg, and rebuked in the following energetic words:

"You talk impiously: begone, you wicked spirit! You are in the spiritual world, and do you not know that predestination implies that some are appointed for heaven and some for hell? Have you any other idea of God than as of a tyrant, who admits his favorites into his city, but condemns the rest to a slaughter-house? Be ashamed then, and blush for your doctrine!"

The extracts which have been made will be sufficient to exhibit the ridiculous side of Swedenborg's revelations of his intercourse with the spiritual world, and the insane extravagance of his pretensions; nevertheless, it would be a great mistake to suppose that all which he says in his "Arcana Cœlestia" is equally foolish; it cannot, indeed, be denied that there is much of a very different character. Take, for example, his acount of character, which he asserts to be the only passport to heaven; it is unchangeable after death: wherever there is a man in whose heart benevolence rules, there is an angel; and wherever there is a man in whose heart selfishness rules, there is a devil, who will remain so for all eternity. "Ample experience enables me to testify that it is impossible to communicate heavenly life to those who have led an infernal life on earth."

"Some who believed that they could easily receive divine truths after death from the lips of angels, and therewith amend their habits, were subjected to the experiment. Some of them understood the truths they heard, and appeared to accept them; but presently, when left to themselves, they rejected, and even argued against, what they had learned. Others denied the truths as quickly as they were spoken. . . . They are told for their instruction that heaven is not

denied to any one by the Lord, and that if they please they may go there and stay as long as they like. When, however, they make the attempt, they are seized at the threshold with such anguish that, in their torment, they cast themselves down headlong."

From these and similar experiments, it is rendered certain that no change in character is possible after death; to transform an evil life into a good life would be to destroy it altogether. Surely there is a far higher sense of truth than there is in the vulgar fancy that in changing worlds there will be a change of character; that a man, in taking leave of this life, will take leave of his tastes, feelings, habits, and opinions, and undergo suddenly a revolution of nature equivalent to the destruction of his identity and the creation of a new being. Were such a transformation to take place, it is quite plain that the individual would not know himself any more than the butterfly knows the caterpillar which it has been, and that no one else would know him: that he would not need, therefore, to concern himself greatly about a future state of immortality in which he would be so completely cut off from his earthly life as to have no real relation to it. That only which has been heavenly here will be heavenly hereafter. What, in truth, is the heavenly reward of a virtuous life but the love of virtue and the unhindered practice of virtuous acts? What the punishment of hell but the delight in vice and the unrestrained indulgence of a vicious nature? Whatever his eternal future, each man on earth has heaven or hell in and around him, and will assuredly take one or the other with him wherever he goes, and not find it there. Accordingly, Swedenborg asserts that no one is punished in the world of spirits for deeds done on earth. An evil spirit is only punished for the crimes he then and there commits. "Nevertheless, there is no actual difference, whether it is said that the wicked are punished for their crimes on earth, or for the crimes they commit in the world of spirits; because every being preserves his character through death, and attempts to repeat the deeds done in the flesh."

He observed that the angels at once discovered a man's autobiography in his structure:

"When a man's deeds are discovered after death, his angels, who are inquisitors, look into his face, and extend their examination over his whole body, beginning with the fingers of each hand. I was surprised at this, and the reason was thus explained to me:

"Every volition and thought of man is inscribed on his brain; for volition and thought have their beginnings in the brain, whence they are conveyed to the bodily members, wherein they terminate. Whatever, therefore, is in the mind is in the brain, and from the brain in the body, according to the order of its parts. Thus a man writes his life in his physique, and thus the angels discover his autobiography in his structure."

Is there not here the assertion of a great scientific truth, whether it be a truth of the spiritual world or not? The history of a man is his character, and his character is written on his organization, and might be read there had we but senses acute enough to decipher the organic letters. There is not a thought of the mind, not a feeling of the heart, not an aspiration of the soul, not a passion that finds vent, not a deed which is done, that is not graved with an unfailing art in the structure of the body; its every organ and the constituent elements of each organ grow to the fashion of their exercise, and there is nothing covered that might not be revealed, nothing hid that might not be known. Is not this a high, solemn, and appalling thought? If there be a resurrection of the body, then the opening of the book at the day of judgment will be an unfolding of the everlasting roll of its remembrance; but if the body rise not again, still its life has not passed issueless, for every act has blended with and become a part of the energy of Nature, increasing or diminishing the evil or good in it, and will never through all time have an end.

What Swedenborg says concerning the mode of life necessary in order to enter heaven, deserves to be quoted as an indication of the practical spirit which he had inherited from his shrewd and rather worldly father. To live for heaven it is

not at all necessary that a man cease to live outwardly as others do; he may grow rich, keep a plentiful table, dwell in a fine house, wear splendid apparel, and enjoy the pleasures of the world and the flesh:

"It is quite allowable that a man should acquire and accumulate wealth, provided he employ no cunning or wicked artifice; that he should eat and drink delicately, provided he do not make life consist in eating and drinking; that he should dwell in magnificence according to his estate; that he should converse as others do, frequent places of amusement, and busy himself in worldly affairs. There is no necessity for him to assume a devout aspect, a sad countenance, or to hang his head; he may be glad and cheerful; nor is he compelled to give to the poor, except so far as he is moved by affection. In one word, he may live outwardly as a man of the world, and such conduct will not hinder his admission to heaven, if only he thinks interiorly in a becoming manner of God, and in business deals righteously with his neighbor.

"From much conversation and experience among angels, it has been given me to know most certainly that the rich enter heaven as easily as the poor; that no one is excluded from heaven, because he has lived in abundance, and that no one is admitted because he has been poor. Rich and poor alike have entered heaven, and many who have been rich enjoy greater glory and happiness than those who have been poor. The poor do not go to heaven on account of their poverty, but on account of their life; for whether a man be rich or poor, he is what his life is, and if he live well he is received, and if he live ill he is rejected."

A far more easy and practicable religion for every-day life than the religion which Swedenborg claimed to have carried forward to a new and higher development. It has been charged against the moral precepts of Christianity, as taught in the New Testament, that they concern themselves with suffering only, not with doing, inculcating passivity, but nowise helping in the active work of life, and therefore, if carried out in practice, placing the good man entirely at the mercy of the bad. They do not, it is said, constitute a complete code of doctrine sufficient for guidance and direction in the practical struggle of existence, but require to be supplemented by a series of maxims applicable to the develop-

ment and formation of character under the duties and responsibilities of active life. Certainly it is not in the New Testament that men find the principles requisite for the successful conduct of life on the exchange, at the bar, in the senate, or in any other department of eager competition and strife. It would scarcely be correct to say that Swedenborg has furnished a practical code of morality deriving its life and power from the morality of the New Testament; but he has throughout his writings produced such a mass of sound criticism and instructive commentary as constitutes an important contribution to a practical system of Christian ethics. He is inconsistent, he contradicts himself, he puts forward strange and unacceptable doctrines; still his clear sincerity, and marvellous powers which he frequently displays in his exposition of the Scriptures, call forth irresistibly a feeling of admiration, and almost constrain, not a belief in his spiritual pretensions, but an acquiescence in Emerson's description of him as a colossal soul, "one of the mastodons of literature." It would be impossible, by the quotations which we are able to make here, to give a faithful idea of his moral reflections and scriptural commentaries; while reading some of them one is constrained to look back from time to time to his history, and to the character of some of his other writings, in order to recall the madness of his pretensions. The extract which follows, dealing with the scriptural maxim to love your neighbor as yourself, will serve to show the characteristically practical turn which Swedenborg gives to it. It is not the individual who is to be loved, but the goodness and truth in him that are to be loved:

"Set before you three persons, or ten, whom you may be selecting for some domestic office, and what other criterion have you but the goodness and truth which are in them? Man is man from goodness and truth. Or, if you are selecting one or two to enter your service, do you not inquire into the will and intellect of each? The neighbor you can love will be the one you will choose on this occasion. A Man Devil may present the same appearance as a Man Angel. Benefiting the Man Angel for the sake of goodness and truth in him, and not benefiting the Man Devil, is charity; for charity consists

in punishing the Man Devil if he does evil, and in rewarding the Man Angel.

"A man is a neighbor according to the kind and measure of his goodness. Whoever does not distinguish mankind by the test of goodness may be deceived in a thousand instances, and his charity confounded and annulled. . . . It is commonly believed that a brother or a kineman is more a neighbor than a stranger, and a fellow-countryman than a foreigner; but birth does not make one person more a neighbor than another, not even a father or a mother, nor education, nor kin, nor country. Every one is a neighbor according to his goodness, be he Greek or gentile. . . .

"Charity, that is really genuine, is prudent and wise. Other charity is spurious, because merely impulsive, gushing from the will without qualification in the light of the understanding."

When an evil-minded person takes the coat which belongs to another, it is no charity to give him a cloak also—the charity is to get him punished as expeditiously as possible; and the worst use to put great possessions to is to sell them in order to give to the poor, merely because they are poor. Such is the evolution to which the passive morality of Christianity comes in the church of the New Jerusalem; and it is not improbable that some of those conscientious men who sincerely accept Swedenborg as a prophet find no little comfort of mind in a code which, while deriving its inspiration from the morality of the New Testament, yet adapts it to the exigencies of daily life in the world where the wicked abound, and must be held in some kind of subjection. Prime-Minister Höpken, who had known Swedenborg for two-and-forty years, and who averred that in all his experience he did not recollect a character of more uniform excellence—always contented, never fretful nor morose—said of his religion:

"I have sometimes told the king that if ever a new colony were formed, no better religion could be established there than that developed by Swedenborg from the Sacred Scriptures, and for these reasons:

"I. This religion, in preference to, and in a higher degree than any other, must produce the most honest and industrious subjects; for it places, and places properly, *the worship of God in uses.*

"II. It causes *the least fear of death;* death being regarded mere-

ly as a transition from one state to another, from a worse to a better situation. Upon his principles, I look upon death as of hardly greater consequence than drinking a glass of water."

One virtue of Swedenborg, which he shares with Bacon and Goethe, and which should be made mention of here, was that he detested, and gave vigorous expression to his detestation of, metaphysics, as barren and fallacious, transcending the sphere of thought, and by means of which theology had been drawn from its simplicity and made artificial and corrupt. It was seldom that his practical instincts deserted him; he was certainly not, in any just sense of the word, a mystic.

Thus much as to the revelation which Swedenborg makes of himself in his writings. It will be interesting, before concluding, to ascertain the sort of impression which he produced on those who had personal intercourse with him. Unfortunately, the principal information which we have on this point comes from those who have been specially interested in giving it, and whose testimony is not free from the bias of their belief in his pretensions. Stories in confirmation of his miraculous powers are related as wonderful and true, while stories discrediting them are put down as false and spiteful. The vulgar notion that a madman must be incoherent, or dangerous, or furious, prepared those who had read his extraordinary revelations to find something strange in his behavior; and when they were introduced to a calm and courteous old gentleman, who conversed sensibly on all ordinary subjects and related his extraordinary spiritual experiences with a quiet and assured confidence, they were naturally surprised, and found it hard to believe that his stories had not some real foundation. How little warranted by facts such a conclusion was, an hour's experience in a lunatic asylum would have proved to them. Then, again, it is not likely that any one, not particularly interested in him, would be at the pains to put on record their experience of him. Mrs. Cottle is constantly publishing extraordinary interpretations of Scripture, and distributing them far and wide, as Swedenborg distributed his books to bishops, deans, clergy, univer-

sities, and persons of eminence in different countries; but no one thinks it worth while to enter upon a formal refutation of Mrs. Cottle, or to record for the benefit of generations to come their opinion of her lunacy. What is self-evident needs no demonstration. When we do happen to get the evidence of disinterested witnesses, who had had opportunities of lengthened observation, it proves that the suspicion of madness was excited by his singular behavior. On one of his voyages from Sweden to England, when he had kept his berth almost the whole time, and had been often heard speaking as if in conversation, the steward and cabin-boy informed the captain that their passenger was out of his mind. "Out of his mind or not," said the captain, "as long as he is quiet I have no power over him. He is always reasonable with me, and I have the best of weather when he is aboard." Those that go down to the sea in ships are not free from superstition, and Swedenborg's presence on board seems to have been thought lucky, as associated with a quick passage. At one time he appears to have run some danger of being sent to a lunatic asylum, his nephew Bishop Filenius and some of the clergy having entertained the idea on account of the offence which his heretical doctrines were to the established religion. Happily the design, if it were ever seriously entertained, came to naught: it would have been a great pity and a greater injustice had it been carried into effect. Neither science nor philosophy had yet apprehended all things that are in heaven and earth, and it is always well, therefore, to examine without prejudice, rather than to suppress with hasty violence, any novel opinions, however strange and incredible they may seem. The history of the progress of knowledge is a history of the incredible becoming credible, of the strange being found true.

For a short time, in 1761, Swedenborg took an active part, as a member of the House of Nobles, in the deliberations of the Swedish diet. He evinced great interest in the questions which were discussed, spoke with credit to himself, and was listened to with respect; but soon perceiving, as he thought.

that envy, hatred, and self-seeking, prevailed among the members, he became dissatisfied, and ceased to attend. Instead of living and laboring among men, helping by patient endurance and wise insight to guide and lead them in the right way—being in the world, if not of it—he retired to his meditations and visions, where he had matters all his own way. Thus he abandoned a life of action, whereby the just balance of the faculties is maintained, and went willingly the way of his madness.

When in Sweden he lived in a small house, which he had built himself in one of the suburbs of Stockholm, his servants being a gardener and his wife, who lived in the house. He gave very little trouble, his diet being very simple; he made his own coffee, which he drank freely day and night, and his dinner was usually a small loaf broken into boiled milk. He slept between blankets, not liking sheets, and, as he informed the Rev. A. Ferelius, "never washed his face or hands, and never brushed his clothes, for no dirt or dust would stick to him." His bodily health was usually good; sometimes, however, he suffered from severe toothache, which he attributed to hypocritical spirits who beset him. On one occasion Paul was the wicked spirit that thus troubled him. A most wicked adulterer was with him some days, and produced pains in the toes of his left foot, loins, and breast. Devils tried to enter his brain and kill him, but the Lord saved him. So it was with other pains, which ceased when the evil spirits which induced them were routed. He paid little regard to day and night, sometimes sleeping through the one and working through the other, and he would occasionally lie in bed entranced for days together. He was often heard talking aloud in the night, and when asked what had been the matter, would answer that evil spirits had blasphemed, and that he was speaking against them zealously.

"Sometimes he would weep bitterly, and cry, with a loud voice, 'Lord, help me! O Lord, my God, foreake me not!' When seen in theee states, he appeared as sick. When delivered from them, he would say, 'God be eternally praised! All suffering has passed

away. Be comforted, my friends; nothing happens to me which the Lord does not permit.'

"After one of these trials, he went to bed and did not rise for several days. His servants grew uneasy; perhaps he had died of fright; and they debated whether they should not summon his relatives, and force open the door. At length the gardener climbed to the window, and, to his great relief, saw his master turn in bed. Next day he rang the bell. The wife went to the room, and related how anxious they had been, to which he cheerfully replied he had been very well, and had wanted for nothing."

He was accessible and affable to visitors, women excepted,* and talked freely concerning his intercourse with the spiritual world, speaking with such an air of gravity and sincerity as prevented any unbecoming display of incredulity. Nevertheless, he exhibited considerable shrewdness in evading attempts on the part of believers to obtain a positive test of his wonderful powers. A certain student of Upsal, Nicolas Collin, who, having read his books with admiration, visited him, requested as a great favor that he would procure him an interview with his brother who had died a few months before. Swedenborg inquired what his motives were for desiring such a communication. "I confessed I had none besides gratifying brotherly affection, and an ardent wish to explore a scene so sublime and interesting to a serious mind. He replied that my motives were good, but not sufficient; that if any important spiritual or temporal concern of mine had been the case, he would then have solicited permission from the angels, who regulate those matters." Lavater, who wrote to him from Zurich with great respect and sincerity, putting four definite questions which he was eager to have answered, was not more successful. Swedenborg did not reply to the letter; and a second letter, similarly earnest and pressing, which Lavater sent, was also left unanswered, notwithstanding the profound expression of reverence and the urgent entreaty which it contained. To a minister of state

* He would see no lady alone, asserting that "women are artful and might pretend that I sought their closer acquaintance." Evidently he had not failed to profit by the mistress-keeping experience of his younger days.

who applied to him for information concerning a certain young prince who had disappeared, without any one knowing what had become of him, he replied that the prince was in a society of the spiritual world to which he could not readily gain admission; that the angels had no knowledge of his state; and that the matter was not of sufficient importance to warrant an application to the Lord about it. Profusely liberal in his revelations when there was no opportunity of checking his stories, he evaded such direct questions as would have brought his pretensions to the test of experiment. It is, as it ever has been, a circumstance incidental to manifestations of the supernatural that they fail to take place just when, in order to confound the skeptical, they ought to take place, and that they are needlessly abundant in the presence of those who are so full of faith that they do not require to be convinced in order to testify of them. No wonder, then, that so many persons who find it nowise contrary to the order of Nature to believe in the existence of fanatics, madmen, and impostors, claiming supernatural powers and witnessing to supernatural stories, do find it altogether contrary to their experience of the order of Nature to believe in supernatural events.

About the beginning of August, 1771, Swedenborg visited England for the last time. He took possession of the lodgings in Cold Bath Fields which he had occupied on a former occasion, at the house of one Richard Shearsmith, a wig-maker. There, on Christmas Eve, he had a stroke of apoplexy which deprived him of the power of speech and produced paralysis of one side. From this attack he rallied for a time, recovering his speech; but on the 29th of March, 1772, he gently expired, having, it is said, predicted on what day he should die. "He was as pleased," said the servant, "as I should have been if I was going to have a holiday, or going to some merry-making."

Thus passed over to the silent majority one the story of whose life, notwithstanding the eccentricities which it exposes, cannot fail to excite a kindly interest. There would be no advantage, but on the contrary a certainty of misinter-

pretation, in attempting to make a summary estimate of his character; this is best exhibited in the history of his life. The truth assuredly lies in the mean between the opposing views taken of him. On the one hand, there are those who see in him an inspired seer, and stubbornly refuse to see any insanity; on the other hand, there are those who see only the insanity, and dismiss him with pity or contempt. There is truth in both these extreme opinions, error in both of them. That Swedenborg did, as he asserted, enter the spiritual world and have daily intercourse with angels there, and see and hear the things which he declared that he saw and heard, is an opinion which it would be a humiliation and shame to discuss seriously in this century, unless some reason can be given for supposing that all the delusions of insanity are broken glimpses of a higher region of existence than our sound senses can take cognizance of. In that case, however, it might still be open to dispute whether Swedenborg's heaven discovers any higher scenes and events, or a more exalted order of beings, than the world in which we live; for it seems truly rather a vulgar and a commonplace invention, such as any person of ordinary ingenuity giving the rein to his fancy, and untroubled by any doubt of himself, might easily imagine. Certainly there is nothing in his revelation which by its inherent power and grandeur intimates even, much less testifies to, a superhuman insight; nothing which is inconsistent or incompatible with the wild imaginations of a person the balance of whose faculties has been lost. Like the painter's picture of a lion beneath which it was necessary to write "This is a lion," Swedenborg's representation of the spiritual world needs a like inscription in order to be known. Looking simply to the intellectual power displayed in its manufacture, we are bound to acknowledge that it cannot be compared for a moment with that which is exhibited in a drama of Shakespeare, or even with that which we may recognize in a superior novel. Compare the visions of Swedenborg, who had so many times been in heaven, with the visions of Dante, "the man who

had seen hell;" do they not show by the side of these like the wild, dreary, and incoherent flights of a dreaming or a delirious imagination? How immeasurably below the true and noble creations of a great imagination, rightly cultivated, working calmly under the restraints of law, and revealing its insight and strength in its repose and self-control! Consider the ridiculous height to which Swedenborg exalts himself; he is as much superior to the inhabitants of heaven as he is to the dwellers upon earth, for, while possessing, as a natural man, all the privileges of spiritual insight which the angels have, and easily surpassing them in spiritual knowledge, he can in a moment become invisible to them, by returning to his natural self. That he has found disciples who devoutly accept to the uttermost these pretensions proves that it is impossible to be too bold in speculating on the credulity of mankind.

On the other hand, it cannot be denied that among the many absurd things he has written, there are also many words of wisdom, fruitful veins of original thought, and passages profoundly suggestive even to the best of minds. Because a man's mind is unsound, all which he says is not, therefore, folly. It is a vulgar and mischievous error, springing from the grossest ignorance of insanity, to suppose that a person who speaks rationally and behaves with propriety cannot be mad, as it is also to suppose madmen necessarily incapable of rational intellectual exertion; athwart the murky atmosphere of madness lightning-flashes of the deepest insight occasionally shoot, and the light of genius is sometimes only the light of a falling star. The recognition of Swedenborg's hallucinations and delusions, and the rejection of the cardinal doctrines of his later years, on the ground of insanity, by no means warrant the rejection of all that he has developed from his false premises or engrafted on them. Moreover, though he was insane, he was capable of taking care of himself sufficiently well, and of managing his affairs with prudence.

Perhaps it was fortunate for the prophet of the Church of the New Jerusalem that he lived in Sweden, and in the last

century; for, had he lived at the present day in England, it is very doubtful whether he would have been left in undisturbed possession of his freedom and his property. There might, indeed, have been no small danger of the extinction of his prophetic mission in a lunatic asylum. Whether the world would have suffered loss, or gained any thing by the violent suppression of his doctrines, are questions concerning which conjectures must be futile; but my conviction unquestionably is that it would have suffered loss. In truth, no one has yet sufficiently considered how much originality and individuality are systematically suppressed in lunatic asylums, and how hard it would have gone with some of the most distinguished reformers of past generations if their lots had been cast in these days when there are scattered over the land so many overgrown and overcrowded asylums. Can any one, after reading the Journal of George Fox, believe that he would not, had he lived now, have found his way into a lunatic asylum? Thus would Quakerism have been blasted in its germ, and the world robbed of all the benefit which it has reaped from that form of religious belief. Of autobiographies, one of the most interesting is the autobiography of Benvenuto Cellini, but the perusal of it cannot fail to convince a candid reader that Benvenuto Cellini, had he lived now, would have been shut up in a lunatic asylum long before he had produced his finest work of art. Had not Comte been removed from Esquirol's asylum when there seemed no prospect of his recovery, and taken home to the care of his wife, it may be deemed certain that the world would never have had the system of the Positive Philosophy. The power of the stepping out of the beaten track of thought, of bursting by a happy inspiration through the bonds of habit and originating a new line of reflection, is most rare, and should be welcomed and profited by, in spite of its oftentimes becoming extravagant, and sometimes degenerating into the vagaries of insanity. The individuals who manifest these impulses of development may not see their true relations, and may carry them to a ridiculous extreme: but they are still, perhaps, the unconscious organs of a new

birth of thought, which shall plant itself and become largely fruitful in the minds of others possessed of a larger philosophic capacity, but not, perhaps, capable of the originating inspiration; for the men who perceive and coördinate the tendencies of development are not commonly the men who originate them. The originality is truly an inspiration, coming we know not whence, and the very opposite in action to that power of habit which enthralls the mental life of the majority of mankind. There are antagonistic forces at work in the determination of the orbit of human thought as there are in the determination of the orbits of the planets—a centrifugal or revolutionary force giving the expansive impulse of new ideas, and a centripetal or conservative force manifest in the restraining influence of habit; the resultant of their opposing actions being the determination of the orbit of the evolution of mind. Is it not, then, beyond measure sad to think that precious germs of originality may be blighted by the practice, too prevalent in this era, of treating as insanity any marked deviation from the common standard of thought or action? Nature, we know, shows a most lavish and reckless waste of life, of fifty seeds often bringing not even one to bear, but herein does not set an example which it is man's duty or interest to follow; for the purpose or *nisus* of his being is to improve upon Nature, to carry it through human nature to a higher evolution. In accomplishing patiently and faithfully this function he must work by a far other method than that which self-inspired seers into self-created spiritual worlds adopt; but, while rejecting their method, he may still gratefully gather the good fruits of their lives, and profit by the instruction which is to be obtained from the study of even the most erratic orbits. Now, as ever, and forever, it is true that the wrath, the folly, the madness of men are made to praise Him whom sun and moon, fire and heat, winter and summer, mountains and hills, seas and floods, the green things of the earth, and the holy and humble men of heart, bless, praise, and magnify forever, but whom systems of theology and the prophets thereof have so much misrepresented and degraded.

III.—THE THEORY OF VITALITY.*

It has been the custom of certain disciples of the so-called Positive Philosophy to repudiate as extravagant the well-known opinion of Protagoras, that man was the measure of the universe. If the proposition be understood of man as he is known to himself by the revelations of self-consciousness, there is unquestionably great reason for its rejection; but, if it be applied to him as an objective study, it is manifest that modern science is tending to prove it by no means so absurd as it has been sometimes deemed. Day by day, indeed, is it becoming more and more clear that, as Sir T. Browne has it, man "parallels Nature in the cosmography of himself;" that, in truth, "we are that bold and adventurous piece of Nature which he that studies wisely learns in a compendium what others labor at in a divided piece and endless volume." † The "heaven-descended γνῶθι σεαυτόν" acquires new value as a maxim inculcating on man the objective study of himself.

The earliest cultivators of Grecian philosophy—Thales, Anaximenes, and Diogenes of Apollonia—did seek objectively for the ἀρχή or first principle of things common to man and the rest of Nature. This primitive kind of induction was soon, however, abandoned for the easier and speedier deduction from the subjective facts of consciousness; so that, as the German philosopher is said to have done with

* *British and Foreign Medico-Chir. Review*, No. 64, 1863.
† *Religio Medici.*

the elephant, man constructed the laws of an external world out of the depths of his own consciousness. Because an individual was conscious of certain passions which influenced his conduct, he fancied that natural bodies were affected in their relations to one another by like passions. Hence the phenomena of Nature were explained by sympathies, antipathies, loves, discords: oil had an antipathy to water; Nature abhorred a vacuum; Love was the creative force which produced development and harmony; Hate, the destructive force which produced disorder and discord. The method was only a phase of the anthropomorphism by which the Dryad was placed in the tree, the Naiad in the fountain, and the gods of mankind were created by man.

The result of such a method was inevitable. When in a language there is but one word for two or three different meanings, as happens in all languages before the cultivation of science—when, for example, the loadstone is said to attract iron, the earth to attract heavy bodies, the plant to attract moisture, and one mind to attract another, without further differentiation—there necessarily is an ambiguity about words; disputes thereupon arise, and the unavoidable issue is sophistry and sophists. That was a result which the ingenious and active mind of Greece soon reached. In scientific nomenclature it is constantly becoming necessary to discard words which are in common use, because of their vagueness and want of precision; for as it is with life objectively, and as it is with cognition or life subjectively, so must it be with the language in which the phenomena are expressed. A scientific nomenclature must rightly present a progress from the general to the special, must reflect in its increasing specialization the increased specialization of human adaptation to external Nature. As might be expected, Plato and Aristotle both recognized the evil in Greece, and both tried to check it. The metaphysics, analytics, etc., of the latter have been described as a dictionary of general terms, "the process throughout being first to discover and establish defi-

nite meanings, and then to appropriate to each a several word."* But it is in vain to attempt to establish words except as living outgrowths of actual facts in Nature. The method was a mistaken one; there was not an intending of the mind to the realities of external Nature, and knowledge was barren, wanting those "fruits and invented works" which Bacon pronounces to be, as it were, "sponsors and sureties for the truth of philosophy."

Much the same thing happened in the earlier part of the Middle Ages. The mysticism and sophistry which then prevailed, the endless and unprofitable but learned and ingenious disputes concerning empty propositions and words which had no definite meanings, might be said to represent the wasted efforts and unavailing strength of a blind giant. But as the infant, moved by an internal impulse, at first strives unconsciously for its mother's breast and draws its nourishment therefrom, gradually awakening thereby to a consciousness of the mother who supplies it, so the human mind for a time gathered unconsciously the material of its knowledge from Nature, until it was gradually awakened to a full consciousness of the fruitful bosom which was supplying it. The alchemist, moved by his avarice and the instinct of a unity in Nature, and the astrologer, moved by the feeling of a destiny governing human actions, both lighted on treasures which, though not then appreciated, were yet not lost; for of astrology came astronomy, and from alchemy, in the fulness of time, was born chemistry. In Roger Bacon, who successfully interrogated Nature in the spirit of the inductive method, we

* Coleridge's Literary Correspondence. It is for this attempt, praiseworthy surely as far as it went, that Bacon is unduly severe upon Aristotle in some parts. Thus: "And herein I cannot a little marvel at the philosopher Aristotle that did proceed in such a spirit of difference and contradiction toward all antiquity, undertaking not only to form new words of science at pleasure, but to confound and extinguish all ancient wisdom." (De Augmentis Scientiarum.) And again: "Aristotle, as though he had been of the race of the Ottomans, thought he could not reign except the first thing he did he killed all his brethren." (Ibid.)

see the human mind instinctively and, as it were, unconsciously striving after the true source of knowledge; while in the Chancellor Bacon, who established the principles and systematized the rules of the inductive philosophy, we see it awakened to a clear apprehension of the necessity of doing with design and method that which in an imperfect manner it had for some time been blindly aiming at. But as it is with the infant, so it is with humanity: action preceded consciousness, and Bacon was the efflux of a spirit which prevailed, and not the creator of it.

The method of investigation has accordingly been completely reversed. Instead of beginning with himself and passing thence to external Nature, man begins with Nature and ends with himself; he is the complex to which his investigations ascend step by step through progressively increasing complications of the simple. Not only so, but the necessity of studying himself objectively is fully recognized; it is not the subjective feeling of heat or cold in a feverish patient, but the figure at which the thermometer stands, that is now appealed to as the trustworthy index of the real temperature. The development of the senses, or, in other words, the increased specialty of human adaptation to external Nature, has been, as the progress of science proves, the foundation of intellectual advance; the understanding has been developed through the senses, and has in turn constructed instruments for extending the action of the senses.* The telescope has merely been a means for enabling the eye to penetrate into distant space, and to observe the motions of worlds which the unaided vision would never have revealed; by the microscope the minute structure of tissues and the history of

* A great desideratum is a history of such development of the senses: "Wir besitzen gar treffliche Werke über die Geschichte von Schlachten und Staatsformen, gensus Tagebücher von Königen und fleissige Verzeichnisse von den Schöpfungen der Dichter. Aber den wichtigsten Beitrag zu einer Bildungsgeschichte des Menschen in der eingreifendsten Bedeutung des Wortes hat noch Niemand geliefert. Uns fehlt eine Entwickelungsgeschichte der Sinne."—Moleschott, *Kreislauf des Lebens.*

the little world of the organic cell have been made known; the balance has demonstrated the indestructibility of matter, and has supplied to science the exactness of the numerical method; and, in the electric stream, there has been found a means of investigating nerve-action, like that which there is in polarized light for ascertaining the internal condition of crystallized bodies. Who would have ventured to predict some time since that it would ever be possible to measure the speed at which an impulse of the will travels along the nerves? * And who will venture to say that it will not at a future time be possible to measure the velocity with which one idea calls up another in the brain? Biology must plainly of necessity be the last and most difficult study, for it presupposes the other sciences as vital force supposes inferior forces; but it is the evident tendency of advancing knowledge to bring life more and more within the compass of scientific investigation. And if it be sometimes made a reproach to science, as it was by Comte, that it has not discovered the laws of life, it may well rest calm under the censure, point-

* Such an eminent physiologist as Müller could venture to predict the impossibility thereof. In his Physiology he says: "Wir werden auch wohl nie die Mittel gewinnen die Geschwindigkeit der Nervenwirkung zu ermitteln da uns die Vergleich ungeheurer Entfernung fehlt aus der die Schnelligkeit einer dem Nerven in dieser Hinsicht analogen Wirkung des Licht berechnet werden kann." With which compare Helmholtz: "Ueber die Methoden kleinste Zeittheilchen zu messen," etc. 1850.

As long as physiologists considered it necessary to refer the operations of the nerves to the extension of an imponderable or psychical principle, it might well appear incredible that the rapidity of the stream should be measurable within the limits of the animal body. At present we know, from the investigations of Du Bois-Reymond on the electro-motor properties of nerves, that the activity by which the propagation of a stimulus is accomplished is closely connected with an altered arrangement of their material molecules—perhaps even essentially determined by them. Accordingly, the process of conduction in nerves may belong to the series of continuous molecular operations of ponderable bodies, in which, for example, the conduction of sound in the air, or the combustion in a tube filled with an explosive mixture, is to be reckoned. It is not surprising therefore," he adds, "that the speed of conduction should be very moderate." (Ueber die Methoden, etc.)

ing to the history of the earth to show that Nature, having done all else, required a long period before it accomplished the evolution of life.

In spite, then, of a desire on the part of some persons to separate biology from the other sciences, and, notwithstanding the alarm occasionally displayed with regard to the dignity of vitality, it is the certain tendency of advancing knowledge to bring a science of life into close and indissoluble relations with other sciences, and thus to establish in cognition, or to reflect in consciousness, the unity which exists in Nature. When, in ancient times, life was assigned to the stars, the air, the water, a sort of unity was recognized, but recognized only by explaining Nature from a very imperfect knowledge of man; now the task is to explain man on the basis of an increasing knowledge of Nature, and in that way to demonstrate the unity of the whole. What must be the result? Nothing less, indeed, than the reconciliation of the ideal and the real, the identification of subjective and objective. As life is a condition in which an intimate correlation exists between the individual and Nature, it is evident that, while Plato dealt only with *ideas* of the mind, his system must remain comparatively unprofitable; but it is evident also that, since we have learned to discover the *laws* or *ideas* in Nature of which *ideas* in the mind are correlates, it becomes possible to find in Nature an interpretation of Plato's true ideas.* Once for all, it may perhaps be taken for granted that the ideas of genius never can be meaningless; for its mental life is a reflection in consciousness of the unconscious life of Nature. How excellently has this been exemplified in him who embodied in poetical form the scientific spirit of this age! It was the great characteristic of Goethe,

* "But it is manifest that Plato, in his opinion of ideas as one that had a wit of elevation situate as upon a cliff, did descry 'that forms were the true object of knowledge,' but lost the real fruit of his opinion by considering of forms as absolutely abstracted from matter, and not confined and determined by matter; and so turning his opinion on theology, wherewith all his natural philosophy is infected."—*De Aug. Scient.*

as Lavater justly said of him, to give a poetical form to the real; he proved, in fact, that science, in place of rendering poetry impossible, opened a field for the highest poetry. His romance of the Elective Affinities (*Wahlverwandschaften*) starts from the chemical affinities of elements, and applies such affinities to human beings, therein exactly reversing the old method, which, starting from the phenomena of self-consciousness, applied the passions of the human mind to the phenomena of external Nature. Of Goethe it may be justly said, that in him the ideal and the real were happily blended; that he embodied the scientific spirit of the age, and yet was in some respects an advance upon it; that he was a prophecy of that which must be a course of development of the human mind if it be destined to develop.

The foregoing general sketch of the course and tendency of knowledge is fully justified by the present aspect of science. When Nature was first examined objectively the differences in matter appeared manifold, and its modes of energy or activity—that is, its forces—appeared many also. On a more careful use of the senses, however—in fact, by the application of the delicate balance to the products of combustion—it became evident that one form of matter only disappeared to reappear in another form; that it never perished, but only changed. Elementary matter thus passes upward into chemical and organic compounds, and then downward from organic to chemical, and from chemical compounds to its elementary condition. Out of dust man is formed by an upward transformation of matter, and to dust he returns by a retrograde metamorphosis thereof. Corresponding with the changes in the form of matter are changes in its modes of energy or its forces; to different combinations and arrangements of molecules correspond different modes of energy. Force therefore is eternal, like matter, and passes through a corresponding cycle of transformations. The correlation and conservatior of forces, which have always been more or less clearly recognized as necessities of human

thought, are now accepted as scientific axioms, and are daily receiving experimental demonstration.*

Though it may seem difficult to avoid the conclusion that there is fundamentally but one natural force which manifests itself under different modes, yet such a supposition at present transcends the domain of science. As a matter of fact we are compelled, in order to form a satisfactory conception of matter and its forces, to regard it under a twofold aspect. In all our conceptions we imply a sort of dualism of power in every body, though we are very apt to forget it in our generalizations. The hinges of gravitation, for example, keep worlds in their orbits by opposing a centrifugal force which would otherwise drive them afloat into space. The smaller hinges of molecular cohesion hold together the infinitely smaller bodies which we call molecules of matter, in opposition to a repulsive force, which, on the application of a little heat, may drive them off into space, and in volatile substances does so drive them off without heat. It is the same with liquids; their diffusion power is similar in character to the volatility of solids; while "colloids" are volatile, "crystalloids" are comparatively "fixed." There is a relation of molecules to one another which we are compelled to represent in conception as the result of a force of repulsion or tension. And as some sensible image is necessary for the mind in order to the clearness of a conception of the invisible, physics assumes between the ponderable molecules of a body certain ethereal particles which are in a state of sta-

* Epicurus, Democritus, Aristotle, all upheld the eternity of matter; the quotations from Lucretius and Persius on that subject are well known, but the following passage from the *De Augmentis* is not so common: "All things change, but nothing is lost. This is an axiom in physics, and holds in natural theology; for as the sum of matter neither diminishes nor increases, so it is equally the work of Omnipotence to create or to annihilate." Other passages of like import occur in Bacon's writings. And the Braminical doctrine is as follows: "The ignorant assert that the universe in the beginning did not exist in its author, and that it was created out of nothing. O ye, whose hearts are pure, how could something come out of nothing?"

tionary oscillation, the degree of temperature of the body being supposed to depend upon the intensity of the active force of these imponderable intermolecular particles. If the body be suddenly and greatly compressed, these motions are communicated to the imponderable ether outside the body, and tension force thus becomes free force in manifest radiation of heat. "What is heat in us," very justly said Locke, "is in the heated body nothing but motion." When heat is withdrawn from matter—that is, when the tension force becomes free, its molecules get nearer to one another—their cohesion is greater; thus vapors become liquids and liquids become solids.

It seems probable that the necessity of regarding matter under this twofold aspect of attraction and repulsion is owing to man's inability, as being himself a part of Nature, to form a conception of Nature as a whole. He must necessarily regard things in relation to himself; for as he exists only in relation to Nature, and as every phase of consciousness is an expression of this relation, it is plain that one of the elements of the relation cannot free itself, and from an independent point of view watch unconcernedly things as they really are. Thus, though we speak of passivity and activity, they are really not different kinds of action, but different relations of the same kind of action. Whatever be the cause, and however doubtful the philosophical validity of the distinction, we are compelled to regard matter in this twofold relation. One aspect of the relation we describe as passive, statical, cohesion, or, to use the generic term, attraction; the other is active, dynamical, tension, or, to use the generic term, repulsion. Attraction plus repulsion of molecules constitutes our conception of matter; and, in observation of its modes of energy, attraction is recognized in gravitation, cohesion, magnetism, affinity, love, while repulsion is found in the centrifugal force, in heat, in electricity, in antipathy, and hate.

It is in rising to the department of chemical compounds that attraction is found under a new and special phase as

chemical affinity. But, when the chemical union of two molecules into a single one takes place, a diminution of the tension force surrounding each molecule must occur, and, according to the law of the conservation of force, an equivalent of another force must be set free. This happens in the production of heat and electricity; for, as Faraday has shown, chemical action cannot take place without the development of electricity. The amount of force liberated in a simple chemical combination will be the equivalent of the tension force lost. When one atom of carbon combines with one atom of oxygen, a definite quantity of tension force surrounding each molecule disappears, and a definite quantity of heat is accordingly produced. When two molecules separate in chemical decomposition, they necessarily make passive or latent so much active force; so much heat becomes so much tension force. But furthermore, in a chemical decomposition we have the resolution of that very intense and special force, chemical affinity itself; so that the force set free will, one would suppose, far exceed that which becomes latent as tension force around the molecules. We know not why two molecules should chemically combine; we accept as a fundamental law of their nature this high, special, and powerful form of attraction; but we do know that, when chemical decomposition takes place, a little chemical force must be resolved into a large display of inferior force. It is a fact authenticated by Faraday, that one drop of water contains, and may be made to evolve, as much electricity as under different modes of display would suffice to produce a lightning-flash. The decomposition of matter is the resolution of force, and in such resolution one equivalent of chemical force will correspond to several equivalents of inferior force. Thus chemical force, though correlated with the physical forces, may be said to be of a much higher order than they are.

In the still higher stage of matter in a state of vitality, we meet with chemical combination of a much more complex character than occurs in inorganic matter; attraction appears

under its most special and complex form. Matter, which in its elementary condition might occupy some space, is so blended or combined as to occupy a minimum of space; and force, which, under a lower mode, might suffice perhaps to illuminate the heavens, is here confined within the small compass of an organic cell or of a speck of protoplasm. We have to do, however, with organic matter under two forms—as dead and as living matter, as displaying energy of its own, or as displaying no energy. Dead organic matter has ceased to act, and it is now acted upon; it is at the mercy of the forces which surround it, and immediately begin to effect its dissolution. Heat hastens decomposition, because in the separation of the constituents of organic matter into the ultimate inorganic products—carbonic acid, ammonia, and water—a certain amount of active force must become latent as the tension force of these molecules; and this force the heat supplies. There is also the force of the chemical affinity of the oxygen of the air for the oxidizable elements of the substance; and the combination is necessarily attended with the production of heat. The heating value of organic matter will accordingly increase with the quantity of oxidizable elements; but the matter is by no means so simple as it might at first sight appear to be. Suppose the atom of carbon with which an atom of oxygen combines was previously in combination with, for example, an atom of hydrogen; and the question is, whether the amount of heat produced will be the same as though the atom of carbon had been free? In reality it will not; it must be less, because in the separation of the carbon atom and the hydrogen atom so much active force must become tension force—that is, so much heat must disappear or become latent; and that loss of heat will necessarily counterbalance a part of the heat produced, or the decrease of tension force which occurs, through the combination of the atom of carbon with the atom of oxygen. It is this consideration which appears to invalidate some experiments made and conclusions come to with regard to animal heat.

But there is another consideration. In this mere burning or decomposition of organic matter, or that which represents the passive, statical, or attractive phase of vitality, the active force which results is due partly to force from without, and not solely to the liberation of force latent in the matter. External forces have, as it were, been pulling it to pieces. What, then, on the principle of the conservation of force, becomes of that intense chemical force which is implied in the organic nature of the material, that power which holds it together as a specific material differing in properties from all kinds of inorganic matter? Though dead, the chemical composition of organic substance is the same as when alive; and its future destiny is entirely dependent on the circumstances in which it may be placed. In the air, it is true, it will undergo decomposition into inorganic products; but, if it be surrounded with the conditions of life, if it be exposed to the influence of higher forces, by being given as food to some animal, it does not go downward, but upward, and somehow takes on life again. It is plain what becomes of the statical force under the latter circumstances. But, in the decomposition of organic matter in the air and the correlative resolution of force, it is not so evident what becomes of all the force which must be liberated. That it returns to general Nature can admit of no doubt; but does it all appear as heat? A part of it must necessarily do so, becoming latent as the tension force of the molecules of the ultimate products of its decomposition, and the rest is liberated under some form or other, if not entirely as heat. There is some reason to believe, however, that dead organic substance does not always undergo the extreme retrograde metamorphosis of material and of force before being used up again in vital compounds, even by the vegetable kingdom. It has been shown that not only do pale plants, such as fungi, feed on organic matter, but that soluble humus is regularly taken up by the roots of almost all plants. Prof. Le Conte has shown it to be probable that the decomposition of the organic matter supplies the

force necessary for raising other matter from a lower to a higher stage.* The force necessary for organization is thus furnished by the force which results from disorganization; death and destruction are the conditions of life and development.

When organic matter displays energy—that is, when it has life—its relations with its surroundings are different. As chemical affinity seems to hold the place of attraction in it, and to correspond to gravitation among celestial bodies, cohesive force among molecules, and magnetic force among polar molecules, so its dynamical or vital action seems to correspond to the force of repulsion, to the centrifugal force of heavenly bodies, the tension force of molecules, and electrical repulsion. The display of energy coincides with a molecular change in the statical element. With the function of a ganglionic nerve-cell, for example, a correlative molecular change, or "waste," as it is called, necessarily takes place either in the nerve-element itself or in what is supplied to it from the blood. The substances which are met with in the so-called extractives of nerve-tissue afford abundant evidence of a material waste; for as products of the retrograde metamorphosis are found lactic acid in considerable quantities, kreatin, uric acid, probably also hypoxanthin, and, representing the fatty acids, formic and acetic acid.† And what Du Bois-Reymond proved to happen in muscle, Funke has observed to happen also with nerve: while the contents of nerve-tubes are neutral during rest in the living state, they become acid after death, and also after great activity during life. After excessive mental exercise, it is well known that phosphates appear in

* The Correlation of Physical, Chemical, and Vital Force, and the Conservation of Force in Vital Phenomena. By J. Le Conte, Professor of Geology and Chemistry in South Carolina College. (American Journal of Science and Arts, No. 28, 1859.)

† It is interesting to remark how the products of chemical transformation resulting from nerve-action agree with the products of decomposition after muscular activity, and how the results coincide with what, *a priori*, might have been expected from the great vital activity of nerve-structure.

the urine in considerable quantities; and it is only by supposing an idea to be accompanied by a correlative change in the nerve-cells that we can explain the bodily exhaustion which is produced by mental labor, and the breaking down of the brain under prolonged intellectual efforts. There is even at times a sensation of something going on in the brain; and, in insanity, such anomalous feelings are sometimes persistently complained of. But the change or waste which accompanies energy is restored by nutrition during rest, and the conditions of future energy are thus established; nutritive attraction steadily repairing the waste of centrifugal function. The cell thus, for a time at least, preserves its individuality; and definiteness of energy, with the maintenance of individuality, is what is connoted by vitality.

Is the energy displayed by living matter something quite special? In attempting to answer that question, two considerations should be kept in view. In the first place, an effect need not at all resemble in properties its cause; the qualities of a chemical compound are quite different from those of its constituents. Such a complex compound as organic matter really is may be expected, therefore, to exhibit peculiar properties in no way resembling those of its constituent elements or those of simple compounds. In the second place, the arrangement or grouping of the molecules in a substance, independently of its chemical composition, may greatly alter its properties: there is a molecular as well as a chemical constitution of matter. In that condition of bodies which is described as Isomerism, there are atoms alike in number, nature, and relative proportion, so grouped as somehow to produce compounds having very different chemical properties. Again, it has been found that the same matter may exist under two very different conditions, and with very different properties—as colloidal and as crystalloidal, in a gelatinous or in a crystalline state. And what is the chief difference? It is that the colloidal is a dynamical state of matter, the crystalloidal a statical state. The colloid exhibits energy; its existence is

a continued metastasis; and it may be looked upon, says Graham, "as the probable primary source of the force appearing in the phenomena of vitality." The distinction between the two kinds of matter is, in fact, "that subsisting between the material of a mineral and the material of an organized mass." And yet minerals may exist in the colloidal state; the hydrated peroxides of the aluminous class, for example, are colloids. Furthermore, the mineral forms of silicic acid deposited from water, such as flint, are found to have passed during the geological ages from the colloidal into the crystalline condition; and, on the other hand, in the so-called blood-crystals of Funke, a soft and gelatinous albuminoid is seen to assume a crystalline contour. "Can any facts," asks Graham, "more strikingly illustrate the maxim, that in Nature there are no abrupt transitions, and that distinctions of class are never absolute?"*

The foregoing considerations render it evident that the manifestation of organic energy by matter is not a contrast to the kind of energy which is displayed by inorganic matter, and so far justify the supposition that it may be a question of chemical composition and intimate molecular constitution. Vitality would not then be a special principle, but a result, and would be explained ultimately by the operation of the so-called molecular forces. Coleridge's assertion, that the division of substances into living and dead, though *psychologically* necessary, was of doubtful philosophical validity, would receive a support which its author could scarce have expected for it.

Before granting any conclusion, it is desirable to examine into that which is generally deemed to constitute the spe-

*A further characteristic of colloids is their singular inertness in all ordinary chemical relations, though they have a compensating activity of their own in their penetrability; they are permeable when in mass, as water is, by the more highly diffusive class of substances, but they cut off entirely other colloidal substances that may be in solution. It is evident that our conception of solid matter must soon undergo considerable modification. (On Liquid Diffusion applied to Analysis. By T. Graham, F.R.S. Philosophical Transactions, 1862.)

cialty of life. Now, it is certain, when we consider the vast range of vitality from the simple life of a molecule or cell to the complex life of man, that valid objections may be made to any definition of life. If it be wide enough to comprise all forms, it will be too vague to have any value; if narrow enough to be exact, it will exclude the most lowly forms. The problem is to investigate the conditions of the manifestation of life. A great fault in many attempted definitions has been the description of life as a resistance or complete contrast to the rest of Nature, which was supposed to be continually striving to destroy it. But the elements of organic matter are not different from those of inorganic, whence they are derived, and to which they return; and the chemical and mechanical forces of these elements cannot be suspended or removed within the organism. What is special is the manner of composition of the elements: there is a concurrence of manifold substances, and they are combined or grouped together in a very complex way. Such union or grouping is, however, only a further advance upon, and by no means a contrast to, the kind of combination which is met with in inorganic bodies. Life is not a contrast to non-living Nature, but a further development of it. The more knowledge advances, the more plainly is it shown that there are physical and chemical processes upon which life depends. Heat is produced by combustion in the organism as it is in the fire; starch is converted into sugar there, as it is in the chemical laboratory; urea, which is so constant a product of the body's chemistry, can be formed artificially by the chemist; and the process of excitation in a nerve, on the closure of a constant stream, appears to be analogous to the process of electrolysis in which hydrogen is given off at the negative pole.* The peculiarity of life is the complexity of combination in so small a space, the intimate operation of many simultaneously-acting forces in the microcosm of the organic cell. Knowl-

* A. von Bezold: Untersuchungen über die electrische Erregung der Nerven und Muskeln. Leipzig, 1861.

edge cannot pass the life-boundary, because there are not at present any means of following the intimate changes which take place beyond it; there is a world there into which the senses of man cannot yet enter. But, as each great advance of science has followed some invention by which the operation of the senses has been extended, there can be little doubt that the important step toward a true science of life will be made with the discovery of a means of tracing the delicate processes of protoplasmic activity. Microscopic physics and microscopic chemistry, nay, physics and chemistry of a delicacy beyond the reach of the powers of the highest microscope, are needed. So that it may well be that this generation and generations to come will have passed to their everlasting rest before a discovery of the secret of vital activity is made.

Before dealing with that which is considered to mark a second and great peculiarity of life, namely, its aim or plan, it will be well to illustrate the foregoing remarks from the phenomena of conscious vitality. It is, in truth, with the lowest form of vitality as it is with the lowest form of conscious vitality—with the human mind in the earliest stages of its evolution. A self-conservative impulse moves the most barbarous people to regard the operation of the external forces of Nature, and to adopt rude means to preserve life and to obtain comfort; the savage avoids the current which would drive his frail canoe on the hungry breakers, and shelters his hut from the overwhelming fury of the storm; he may be said to war with Nature for the maintenance of individual power, as the vital force of a cell may be said to war with the nature that immediately surrounds it. But it is obvious that man only struggles successfully with the physical forces by recognizing the laws of their action, and by accommodating his individual forces to physical laws; it is victory by obedience. By conscious obedience to the physical law, he appropriates, as it were, the force thereof, in the increase of his own power; the idea is developed in his mind as the correlate of the law or idea in Na-

ture; in his mental progress Nature is undergoing development through him. By keeping in mind this analogy of the mental force the difficulty will be obviated, which there might seem to be in conceiving the organic cell as a result of physical and chemical forces, and yet as resisting the action of these forces. Every act of so-called resistance on the part of the cell to the natural forces is really a phenomenon indicating the development of them; its life is not a contrast to non-living Nature, but a further complication of it. The fundamental law of life is the same for its conscious and unconscious manifestations; it is individuation by appropriation. And, however necessary it may seem to the individual, as a part of a whole looking at the rest, to represent the vital as in constant antagonism to the physical, such a conception does not faithfully express the condition of the whole regarded as a whole. A just conception of Nature as one harmonious whole is plainly not antagonistic to the spirit of any investigations which may tend to prove the dependence of life on physical and chemical processes.

That which is commonly said to constitute the specialty of life is the maintenance of a certain definite plan; and accordingly Coleridge, following Schelling, defined life as "the principle of individuation." Given the different kinds of force and of matter, and how, it is asked, is the pattern determined and worked out? As every individual is in life weaving out some pattern "on the roaring loom of time," though "what he weaves no weaver knows," so the lowest form of vitality manifests a definite energy, and is said to accomplish a definite plan. A crystal would go on increasing if suitable materials and the conditions of its growth were present, "but it has been provided that trees do not grow up into heaven." Life works according to an aim, said Aristotle. Admitting all this, we are not therefore called upon to admit a special contrast to the rest of Nature. Liebig compares the living body to a building which is constructed after a definite, preordained plan; but it is obvious that exactly in the same

sense might the positive biologist say of the chemical atom, that it is constructed and displays energy according to a pre ordained plan; or even of the crystal, that it works out a certain pattern, seeing that it cannot overstep the laws of its form. The plan is the law of the matter, and the law is not something outside the matter, but it is inherent in it. Organic matter, like the chemical element, has an activity given to itself which it must display; the law of causality is true of it as of inorganic matter; and the organic effect, the so-called accomplishment of the plan, is the necessary result of a certain molecular constitution and certain intimate combinations which exist in the organic molecule or cell or monad, or whatever else we choose to name the ultimate unit of life.

The direct denial of a special vital force has been the natural reaction against that dogmatism which assumed a vital principle that was self-generating, did any thing it liked, and was not amenable to investigation. That any force should be self-generating in inexhaustible quantity is really an inconceivable supposition. If the axiom, that force, like matter, is not capable of annihilation, be accepted, and we find, as we do, that organic bodies incorporate, or somehow cause to disappear, inorganic matter and force, and thereby themselves increase, it is an unavoidable conclusion that the organic matter and force must represent the converted inorganic matter and force. To suppose that the vital force was self-produced would be to suppose a disturbance of the equilibrium of Nature, and it might not then be unreasonable to fear lest the earth, by the increase of its repulsion force, should break through the hinges of gravitation and float off into space, or burst into fragments, as a planet between Mars and Jupiter is supposed at one time to have done.*

* Science, in its view of life, seems to be following the course of development in Humboldt's mind. In his earlier writings he defined vital force as the unknown cause which prevents the elements from following their original attractive forces. (Aphorism. ex doct. Phys. Chem. Plant.) "Reflection and prolonged study," he says, in his "Aspects of Nature," "in the departments of physiology and chemistry, have deeply shaken my earlier belief in

When, however, it is said that a minute portion of living matter converts inorganic matter into its own nature, and thus develops new organic matter which has the power of doing likewise, it is evident that a great and peculiar potentiality is assumed in the living molecule. What power is it which transforms the matter and force? Some who have advocated the correlation of the vital force with the physical forces seem not to have given due attention to this question; they have laid such great stress on the external force as to have fallen into an error almost as great as, though the opposite of, that of the advocates of a self-generating vital force. External circumstances are the necessary conditions of inward activity, but the inward fact is the important condition —it is the determining condition, and, so far as we know yet, it can only be derived from a like living mother structure. Nevertheless, even in that inherited potentiality there is not a contrast to that which happens in the rest of Nature. When heat is converted into electricity, or any force into another, the change is not self-determined; the determining force lies in the molecules of the matter, in the so-called statical force, that which Aristotle in his division of causes names the material cause. And if it be objected that a little life is able to do such a great deal, the answer is that a like thing happens in fermentation. When a certain organic substance makes the inorganic matter in contact with it become organic, it may be that it does so by a kind of infection or fermentation by which the molecular relations of its smallest particles are transferred to the particles of the inorganic just as in the inorganic world forces pass from matter to matter.

But there are further considerations. Admitting that the vital transforming matter is at first derived from vital struct-

peculiar so-called vital force:" And again: "The difficulty of satisfactorily referring the vital phenomena of organism to physical and chemical laws depends chiefly (and almost in the same manner as the prediction of meteorological processes in the atmosphere) on the complication of the phenomena, and on the great number of the simultaneously-acting forces, as well as the conditions of their activity."

ure, it is evident that the external force and matter transformed does in turn become transforming force—that is, vital. And if that takes place after the vital process *has once commenced*, is it, it may be asked, extravagant to suppose that a similar transformation might at some period have *commenced* the process, and may even now be doing so? The fact that in growth and development life is continually increasing, from a transformation of physical and chemical forces, is after all in favor of the presumption that it may at first have so originated. And the advocate of this view may turn upon his opponent, and demand of him how he, with a due regard to the axiom that force is not self-generating, and to the fact that living matter does increase from the size of a little cell to the magnitude of a human body, accounts for the continual production of transforming power? A definite quantity only could have been derived from the mother structure, and that must have been exhausted at an early period of growth. The obvious refuge of the vitalist is to the facts that it is impossible now to evolve life artificially out of any combination of physical and chemical forces, and that such a transformation is never witnessed save under the conditions of vitality.

Thus the argument stands. Meanwhile, those who do believe in the origination of life from non-living matter hope to succeed in artificially producing the upward transformation, and may say reasonably enough that it is not to be expected that such transformation should now take place as a regular process in Nature, except under conditions of vitality. Such a supposition is as unnecessary as it would be to assume that the savage must continue to rub together his sticks, after he has obtained the spark, in order to make the fire burn. What only is necessary is that the spark of fire, or the spark of life, once evolved, should be placed under suitable conditions, and it will then go on increasing. The minutest portion of living matter really now contains implicitly, as it were in a microcosm, the complexity of chemical and physical combinations and the conditions which were necessary for the first

production of life in the macrocosm, and it supplies these as the conditions of further vital transformations. In fact, Nature, having accomplished a result, does not need on each future occasion to go through the preliminary steps by which the result was first arrived at. And in this relation it is very interesting to observe how much use is made of the force supplied by the destruction of certain organic matter in raising other matter to a higher stage. It is supposed, for example, that urea is partly produced by the oxidation of an excess of so-called albuminous matters in the blood, without these having entered into the formation of tissue; and the force thus supplied in the retrograde metamorphosis will be available, and probably is used, for the exaltation of other elements.

It needs but little consideration to see that the living cell cannot supply all the force which is used in increasing and advancing life—in the multiplication and transformation of cells; heat and other external conditions are necessary, as being, so to speak, material for transformation. It is a mistake, however, to say, as some have said, that heat and external conditions determine the rate of growth. The rate of germination, for example, certainly varies according to external conditions, but the limits of variation are fixed by the inherent properties of the structure. The seeds of a begonia taken from the same pod will, as Mr. Paget has pointed out, germinate, some in a day, some at the end of a year, and some at various intermediate times, even when they are all placed under the same external conditions. And the same author has pointed out other indications of self-dependent time-rates in the lower organisms. There are, in fact, internal as well as external conditions of growth, and the former are the more important, for they are really the determining conditions. It is with the organic cell and its conditions as it is with the individual and his circumstances; the latter may greatly modify character, and are necessary for development, but the essential fact, which determines the limit of the modi-

fying power of circumstances, is the nature implanted in the individual.

It is easy to perceive how impossible it is, in the present state of science, to come to any positive conclusion with regard to the nature of the vital force. All that can be said is, that advancing knowledge more and more clearly proves the dependence of life on physical and chemical processes, and tends to show that vital action does not contrast with the kind of action exhibited by inorganic Nature. Living matter displays, in fact, the energy of colloidal and the plan of crystalloidal matter. When vital force undergoes resolution into inferior force, simultaneously with the decomposition of substance, it is into heat, chemical force, and electricity, that we find it, as it were, unfolded; it is a natural conjecture, therefore, that the conditions of the artificial production of vitality must be a high and complex chemistry to represent the statical correlative, and some mode of repulsion force, as heat or electricity, or both, to represent the dynamical correlative. It is certainly extremely unphilosophical in the present condition of knowledge to refuse to accept vitality as a special mode of manifestation of force; the special character of its phenomena demand that, whatever its real nature may be, vital force should for the present be received as a distinct force on the same terms as chemical force or electrical force. The facts of observation, as well as *a priori* considerations, unquestionably demand also that it should be regarded as subject to the laws of the correlation and conservation of force.

As, then, vital force is plainly by far the highest force in dignity, a small quantity of it will correspond in value to a much greater quantity of an inferior force; one equivalent of vital force, in fact, will correspond to many equivalents of the lower forces. An immense amount of force is required to raise matter from its elementary state to that condition in which it is described as organic; and the upward transformation evidently only takes place through the inter-

mediate action of chemical force. But vital force surpasses chemical force apparently in as great a degree as chemical force surpasses physical force. How great, then, must be its mechanical equivalent! Who can measure the power of a great idea? Armies fight in vain against it, and nations yield to its sway. What wonder that life was the last and highest development of Nature, and that it was produced only after the inferior forces had been long in existence! What ground, furthermore, it might be asked, have we for supposing that it is destined to be the last development of force? Is it not possible that a still higher manifestation of force than that which we call vital may ultimately result from the complexity of forces and conditions which are now present on earth? The hypothesis of Laplace was, that in primeval times a large quantity of nebulous matter was spread through space. This nebulous matter was through gravitation aggregated into solid masses. Immense heat must have been thus produced, and this heat might then produce light, and develop electricity as it does now when acting on the thermo-electric plates. Electricity might appear again as heat or as light, or as chemical force, as it does in the decomposing cell of a voltaic battery. The correlation of these forces we are able to trace now, and it is not difficult to conceive how they mutually excited and affected one another in the primeval times when the earth was, as we are told, without form and void. But there was a time when no life existed on the earth. So that as we can now obtain one force from another up to the point where life begins, when we are at fault, similarly considerable time elapsed in Nature before vital force followed on the physical and chemical forces. Science may, then, claim that in its difficulty and delay it only reflects a corresponding difficulty in Nature.

But there are other important considerations with regard to vitality. It does not follow, because we recognize a special vital manifestation, that there is but one kind thereof; it is in reality necessary to admit different degrees, if not different

kinds, of vitality. As with organic matter so with organic force, we trace an advance from the most simple and general to the most complex and special. The tissue of the simple protozoon is uniform and exhibits no trace of structure; its active relations are equally simple. In the ascending scale of life continuous differentiation of tissue corresponds with increasing specialty and complexity of relation with the external, until in man we observe the highest example of a unity of organism proceeding from manifold varieties of elements, and of unity of action from the coördination of many forces. And as it is with the animal kingdom, so it is with the elementary structures which form it; there is a scale of dignity, a hierarchy of tissues; the lowest appear first, and are necessary steps for the evolution of the highest. All the force of Nature could not develop a nerve-cell directly out of inorganic matter; and the cell of the *Protococcus nivalis*, or the molecules of the Amœba, could not, under any possible circumstances, energize as nerve-force. Between the vitality of thought and the vitality of the fungus there is scarcely a comparison possible; the former is dependent upon the widest and most complex, and at the same time the most intense and special relations with external Nature, while the latter exhibits only a few general and comparatively simple relations therewith. Between the relations of a nerve-cell and an epidermic cell with their surroundings, there is as much difference as there is between the relations of a Rhizopod and those of a Cephalopod with external Nature. And the relations of a nerve-cell with its surroundings are, it must be remembered, dependent on the maintenance of the relations of all the inferior elements of the body which intervene in the descending scale between it and the inorganic.

Whatever, then, may be the fact in animal development, it is certain that transformation of species takes place in the structural elements. When a tissue takes material from the blood, it does not merely aggregate, but it assimilates it—that is, it makes it of the same *kind* with itself. In develop-

ment, a higher tissue constantly proceeds from a lower one, and demands the lower one as a necessary antecedent to its production; it has thus, as external conditions, not only those which are general, but the intimate and special influences of the tissue which is before it in the order of existence. In the latter are supplied the special and essential conditions for the exaltation and transpeciation of force and material. But all exaltation of force is, as it were, a concentration of it; one equivalent of the higher force corresponds to many equivalents of the inferior force which has been transformed. Hence it is that the power of reproducing tissues or parts in animals is diminished much more by development than by growth; and the law which describes the reparative power in each species of animal as being in an inverse ratio to its position in the scale of life, though not strictly proved, is yet true as a general proposition.

If, now, the degree of dignity of an element represents a corresponding degree of vitality, it is obviously right to speak of the life of the blood, without any design of placing its life on the same level with that of nerve. In the decomposition of material and the correlative resolution of force which take place when the blood-cell returns to the inorganic state, there will be much less force liberated than when a nerve-cell undergoes the retrograde metamorphosis. As a great expenditure of force is needed to raise matter from the inorganic to the organic state, so a further greater expenditure is required to raise matter from a low organic to its highest organic condition. The nerve-cell is, so to say, the highest parasite which thus sucks up the life of the blood; and, if the process of its decomposition were accurately observed, it would be found that all the force which had been consumed by it in its upward transformation was given back to Nature in its downward metamorphosis.

The retrograde metamorphosis of organic elements is constantly taking place as a part of the history of life. In the function of nerve-cell, a nerve-force is liberated which excites

muscular force, and is ultimately given back to external Nature as motion; the coincident "waste" of substance is received into the blood, and ultimately also passes back to Nature. It is probable, however, that this "waste" does not pass always directly out of the body, but that it may be first used as the nutriment of some lower element. Thus, as there seemed reason to believe that, in the economy of Nature, animal matter did not undergo the extreme retrograde metamorphosis into inorganic matter before being used as food by vegetables, so in the animal body the higher elements do not appear at once to undergo the extreme retrograde metamorphosis, but are first used as the nutriment of lower organic element. How admirably does Nature thus economize in the body! Just as on a larger scale the carbonic acid exhaled by animals is taken up by vegetables, and a poison thus removed from the atmosphere in which the animal lives, so by one organic element of the body the blood is purified from the waste matter of a higher element which would be poisonous to it.

The parts impaired by activity, as all parts must be, are repaired during rest in a condition of health. And it is very interesting to observe, as Mr. Paget has pointed out, that the organic processes of repair in each tissue are adjusted to a certain time-rate, which is variable according to, but is not determined by, external conditions. The time-rate is determined by the implanted properties, and "for each unit of nutrition might be reckoned a unit of time." The periodicities of organic life appear to be prominent instances of the law; and the rhythmic motions of the heart, or the motions of cilia, are, Mr. Paget supposes, due "to a method of nutrition in which the acting parts are, at certain periods, raised with time-regulated progress to a state of instability of composition from which they then decline, and in their decline may change their shape and move with a definite velocity, or (as nervous centres) may discharge nerve-force." * In

* On the Chronometry of Life. By J. Paget, F. R. S. (Croonian Lecture before the Royal Society, 1857.)

this recognition of the chronometry of organic processes, there is unquestionably great promise for the future; for it is plain that the observance of time in the motions of organic molecules is as certain and universal, if not as exact, as that in the motions of heavenly bodies. Each organic process has its definite time-rate; and each cell has its appointed period of life different for different kinds of cells. The exercise of its energy is the accomplishment of the life-task of the gland-cell of the stomach, and its existence ends therewith—it discharges its duty with its life; but it is not so with other cells. It is not known, for example, how soon the blood-cell and other cells die. The blood-cell may be ephemeral, and after the manufacture of its material straightway perish, supplying in the products of its decomposition material for the coloring matters of the bile; or it may accomplish its function more than once, and live therefore for some time. Certain facts do, indeed, point to a short duration, as, for example, the destruction of the nucleus in the blood-cell, the analogy of the cells of the stomach and milk-glands, and of the sebaceous and spermatic-cells, and the great production of blood-cells; but nothing positive is known, and the subject is one which awaits, and ought to receive, careful attention.

Such, then, is the general process of life physiologically regarded. But there is nothing special in disease. Although the destructive cancerous mass seems at first sight to admit of no sort of comparison with the beneficial formation of a developing organ, yet the production is governed by laws of organic growth and activity. No new forces nor new laws appear in the organism under the circumstances which are described as disease. "'Tis as natural to die as to be born," says Sir T. Browne; and, if we choose to accept the doctrine of final cause, we must acknowledge that the disease which leads to death is as natural, as much in the purpose of Nature, as the physiological processes which constitute health. An individual exists in certain relations with the external, and the harmony which results from the maintenance of these rela-

tions is health, while a disturbance of them, whether from a cause in the organism or in the external circumstances, or partly in one and partly in the other, is discord or disease. The phenomena of morbid action may therefore, when properly regarded, be serviceable as experiments illustrating the character and relations of vital action.

As each cell has its appointed period of life, and each species of cell its natural degree of life, and as there are many cells and many kinds of cells in the human body, it is evident that disease will be more easily initiated in it than in an organism with less differentiation of tissue, and less complexity of structure. For the life of the organism is the sum of the life of its individual parts, and superiority of vitality signifies more numerous, special, and complex relations with the external. In the lowest organisms, where there is a similarity of structure, one part is independent of another, and dependent only on the maintenance of certain general and simple relations with the external; there is, therefore, comparatively little liability to disturbance.* When the parts are, however, unlike, and there is a definite subordination of them, so that the well-being of the highest structure is dependent on the well-being of all the structures which intervene in the descending scale between it and inorganic Nature, there is plainly abundant room for disturbance. As in the state, so in the organism, the vitality of the government flows from, and rests upon, the well-being of individuals.

When, from some of the many disturbing causes which initiate disease, a particular elementary constituent of the body is prevented from rising to the dignity of its specific constitution and energy, there will, if the disturbing cause

* Goethe, after saying that every thing living is a collection of living, self-dependent beings, adds: "Je unvolkommner das Geschöpf ist, desto mehr sind diese Theile einander gleich oder ähnlich, und desto mehr gleichen sie dem Ganzen. Je volkommner das Geschöpf wird, desto unähnlicher werden die Theile einander. Je ähnlicher die Theile einander sind, desto weniger sind sie einander subordinirt. Die Subordination der Theile deutet auf ein volkommneres Geschöpf."

has not been so serious as to destroy the life of the part, be a production of an element of a lower kind with a lower energy; and that is a diseased product. It is as if the substance of a polype were produced among the higher physiological elements of the human body, and went on increasing there without regard to relations with surrounding elements of tissue. There may be a production of foreign substance in larger quantity than that which should rightly be formed of the natural tissue, and a greater display of force, but both structure and energy are of a lower order. What is gained in quantity is lost in quality, and the vitality is intrinsically less.

Inflammation in a part is really the result of a degeneration of its vitality. When a wound heals by the "first intention," there is direct adhesion of its surfaces, and no inflammation, for the natural vitality of the part is maintained, and effects the repair. When slight inflammation occurs, the vitality of the part has undergone a certain degeneration, and material of an inferior order to the proper element of the part is produced; this substance binds the surfaces together, and it may in process of time, on the complete subsidence of inflammation, and under the favorable conditions of surrounding healthy tissue life, even rise to the condition of the proper structure. But the lymph does not appear to be thrown out with any special beneficial design; it is the simple result of a deterioration of energy, is only a less degree of a positive evil. When greater inflammation takes place, or when the natural vitality of the part is feeble, there is a greater degeneration, and material of a still lower kind, which is not even organizable under any circumstances, is produced. Pus is poured out, and ceases to appear with the restoration of the proper vitality of the tissue. If the inflammation is still greater, the degeneration passes into actual destruction of life, and mortification ensues. When John Hunter, therefore, speaks, as he does, of Nature calling up the vital powers to produce suppuration, his words convey a false notion of what

really happens. The injury has so damaged the parts that the vital action cannot rise to its specific elevation; an inferior kind of action is alone possible, which is really disease, and only so far beneficial as it proves that the life of the part has not been killed outright. As might be expected, therefore, it is in exhausting diseases that inflammation most commonly and easily occurs. How incorrect, then, is it to speak of inflammation as if it were a process specially provided for restoring the healthy life of parts! When adhesive inflammation is said to limit the suppuration of an abscess, its occurrence is a result of diminishing mischief, and testifies to a less serious degeneration of vital force. How hard it is not to be blind when theories or wishes lead us! When adhesive inflammation fixes a piece of strangulated gut to the side of the belly, so as happily to prevent the passage of fecal matter into the peritoneal cavity, it is sometimes said to be a wise and kindly provision of Nature. What, then, shall be said of inflammation when it glues the gut to a hernial cavity, or manufactures a fibrous band which strangles the gut? Is this also a wise and beneficial design?

That which is true of the material products of inflammation is necessarily true of its force; the heat, and pain, and rigors, the forces as well as the material, testify to a degeneration of vital force. The sort of stormy rage and demonstrative activity which characterize inflammation, though unquestionably an exhibition of force, are not really an increased display of the proper vital force. The latter has undergone a transformation from the quiet, self-contained activity of development into the unrestrained dissipation of a lower activity; and, as regards the latter, it might be said that several monads of its matter, or volumes of its force, are equivalent only to one monad of matter or one volume of force of the former. Rigors, as the involuntary action of voluntary muscle, are a degradation of action witnessing to a molecular deterioration of vital conditions. Heat is a physical force which must have resulted from the retrograde metamorphosis

of vital force. The existence of pain, where rightly there should be no sensation, testifies to a molecular deterioration of statical element and a correlative exhibition of force. The increased action of inflammation in a part is, therefore, diminished vital action. Perhaps it might once for all be stated, as a law of vital action, that the dignity of the force is in an inverse ratio to its volumetrical display. It is indeed with organic action as it is with mental action. The emotional man displays considerable force, and often produces great effects in the way of destruction, but his power is vastly inferior to that of the man who has developed emotional force into the higher form of will-force, who has coördinated the passions into the calm, self-contained activity of definite productive aim. Surely creation always testifies to a much higher energy than destruction.

The foregoing considerations unavoidably flow from a conception of vitality as correlate with other natural forces, and as subject to the law of the conservation of force. They obtain additional weight, however, from being in some accordance with the important generalizations which one of the most philosophical physiologists of the present time has made with regard to morbid products. Virchow has, as is well known, referred all morbid structures to physiological types, and maintains that there is no new structure produced in the organism by disease. The cancer-cell, the pus-cell, and all other disease-produced cells, have their patterns in the cells of healthy structure. The cells of tubercle correspond with the corpuscles of the lymphatic glands; pus and colorless blood-corpuscles cannot be distinguished except by looking at the place whence they come; the cells of cancer in bone "are the immediate descendants of the cells in bone;" and certain colloid tumors have the structure of the umbilical cord. "Where a new formation takes place, certain histological elements of the body must generally also cease to exist;" and every kind of new formation is really, therefore, destructive, and destroys something of what previously existed. The

connective tissue, with its equivalents, he describes as the common stock of germs of the body; from them morbid structures proceed by continuous development. "Heterologous tissues have physiological types; and there is no other kind of heterology in morbid structures than the abnormal manner in which they arise as to place (heterotopia), time (heterochronia), and quantity (heterometria)."*

The conclusions with regard to vital force, which a consistent conception of it as a natural force seems to necessitate, will find extensive application in the various phenomena of disease. We have seen that if the resolution of the vitality of a single nerve-cell into a vitality of a lower kind be supposed—into that, for example, of polype substance—it would necessarily suffice for the production of a whole polype, or perhaps of a multitude of polypes. In other words, one nervous unit, monad, or molecule, is the vital equivalent of many units, monads, or molecules of polype substance. How idle it is, then, to dispute, as some have done, as to whether epilepsy is increased vital action or diminished vital action, when there exists no clear conception of what is meant by the words! No one can deny that there is great display of force in the convulsions of epilepsy, but is it increased vital force? Is a man in convulsions a strong man? for that is the real question. Does convulsion in a paralyzed limb indicate increased vital action of it? When tetanus of a muscle is produced, as Weber showed it might be, by putting a loop of thread round its nerve and slowly and gradually tightening it, does the violent action of the muscle testify to increased vitality? If it really does, then the mechanical tetanomotor of Heidenhain might, properly used, suffice for the cure of every paralysis, and effect a complete renewal of life.

In speaking of vital action, we may either consider the whole organism as individual, or we may consider the cell or organic monad as the individual. If we regard the organism

* Cellular Pathology.

as individual, then when general convulsions take place in it—that is, violent and aimless movements completely withdrawn from the control of the will, which should rightly coördinate them into definite action—it is simply to use words without meaning to say that the vital action of the individual is increased. There is not, then, individual action; and the definition of vitality is not applicable to the organism as a whole. The highest manifestation of individuality is in the consciousness of man, the so-called unity of the ego; but, when the coördination of forces for a definite end is replaced by the convulsions of epilepsy, there is neither subjective nor objective unity of action. Instead of that quiet will-force which expresses conscious unity, or that unconscious unity of organic action which is manifest in sleep, there is the violent and incoherent exhibition of inferior force. Increased action is the result of a degeneration of the proper vital action. "A man in convulsions is not strong, though six men cannot hold him."

Like considerations apply when the single cell is regarded as individual. In virtue of a certain chemical constitution and a certain definite arrangement of molecules, a cell exhibits energy as nerve-force. That special mode of energy is the definite result of a certain coördination of chemical combinations and molecular relations; and these are connoted in the individuality of the cell. When, however, in place of the definite process of statical attraction (nutrition) and dynamical repulsion (energy), there takes place a large demonstrative display of force—as general epileptic convulsions, being the sum of the action of the individual cells, prove there must—it is impossible to pronounce such force as of the same rank or kind as the proper energy of the cell. It is an inferior kind of power, and the certain indication of a degeneration of the statical correlative. It is the duty of a cell, so to speak, as of an individual, to live in certain relations with its surroundings—it is, indeed, its essence as an *individual* cell of specific character; and, when it is not so living, it

is really degenerating, losing its nature or kind, passing more or less quickly toward death. Its action is certainly not increased functional action. In truth, it would be as just to call the extravagant action of madness in an individual occupying a certain position in a system of government increased functional action, and to say that the government was stronger for his degenerate action. A state, again, would not be powerful, would not even exist, if each individual did as his passions prompted, altogether regardless of his relations to others; and it would certainly be a strange use of language to say then that the functional action of that individual was increased.

The phenomena of conscious vitality might be used to illustrate the same principles. A passionate man is not strong-minded, nor do the ravings of insanity reveal mental vigor. A completely-fashioned will is the true mark of a strong mind. "A character," said Novalis, "is a completely-fashioned will." As in the order of natural development there has been an ascent from the physical and chemical forces to the aim-working vital force, and thence from the lowest vitality to the highest manifestation thereof, so in the course of mental development there is a progress through sensation, passion, emotion, reason, to the highest phase of mental force, a well-fashioned will. The rightly-developed mind, like the healthy cell, recognizes its relations to others; self-feeling gives place to or expands into moral feeling, and in the will all the phases of consciousness are coördinated into calm, just, definite action. Noise and fury surely indicate weakness; they are the manifestation of inferior force —the tale of an idiot signifying nothing. The strongest force is quiet force, and the ravings of insanity, which might not unjustly be compared to the convulsions of epilepsy, do not evince mental power.

May we not, then, already perceive, what advancing knowledge must ever render more clear, how the conscious mind of man blends in unity of development with the un-

conscious life of Nature? As the revelation of Nature proceeds in the progress of science, the idealism of Plato and the realism of Bacon will be found to harmonize as expressions of the same truths; the generalizations of Humboldt and the poetical intuitions of Goethe may be looked upon as but different descriptions of the same facts. Idealism and realism blend and are extinguished in the intimate harmony between the individual and Nature. How great, then, the ignorance which fancies that poetry demands a rude age for its successful development! How little, again, the insight which would make of science an ugly anatomy only! After analysis comes synthesis; and, beyond the practical realization of science in works which add to human comfort, there remains the æsthetical embodiment of science. Art has now opening before it a field so wide that imagination cannot dare to limit it, for science must plainly attain to its highest development in the work of the future poet, who shall give to its reality a beautiful form. Goethe indicated the path, but he who shall accomplish it will be a greater than Goethe.*

* Perhaps the truest estimate of science, and the most remarkable prophecy with regard to it, is to be found in that wonderful tale by Goethe, "Das Mährchen," a tale which has been described, by one who has done most toward making Goethe known and understood in England, "as the deepest poem of its sort in existence—as the only true prophecy emitted for who knows how many centuries."

IV.—THE LIMITS OF PHILOSOPHICAL INQUIRY.*

It is not a little hard upon those who now devote themselves to the patient interrogation of Nature, by means of observation and experiment, that they should be counted, whether they will or not, ministers of the so-called Positive Philosophy, and disciples of him who is popularly considered the founder of that philosophy. No matter that positive investigation within the limits which Comte prescribes was pursued earnestly and systematically before his advent, and with an exactness of method of which he had no conception; that many of those distinguished since his time for their scientific researches and generalizations have been unacquainted with his writings; that others who have studied them withhold their adherence from his doctrines, or energetically disclaim them. These things are not considered; so soon as a scientific inquirer pushes his researches into the phenomena of life and mind, he is held to be a Comtist. Thus it happens that there is a growing tendency in the public mind to identify modern science with the Positive Philosophy. Considering how much mischief has often been done by iden-

* *Journal of Mental Science*, No. 70. The Limits of Philosophical Inquiry. Address delivered to the Members of the Edinburgh Philosophical Institution, November 6, 1868. By William, Lord-Archbishop of York. (Edmonston and Douglas.)

tifying the character of an epoch of thought with the doctrines of some eminent man who has lived and labored and taken the lead in it, and thus making his defects and errors, hardened into formulas, chains to fetter the free course of thought, it is no wonder that scientific men should be anxious to disclaim Comte as their lawgiver, and to protest against such a king being set up to reign over them. Not conscious of any personal obligation to his writings, conscious how much, in some respects, he has misrepresented the spirit and pretensions of science, they repudiate the allegiance which his enthusiastic disciples would force upon them, and which popular opinion is fast coming to think a natural one. They do well in thus making a timely assertion of independence; for, if it be not done soon, it will soon be too late to be done well. When we look back at the history of systems of religion and philosophy, it is almost appalling to reflect how entirely one man has appropriated the intellectual development of his age, and how despotically he has constrained the faith of generations after him; the mind of mankind is absolutely oppressed by the weight of his authority, and his errors and limitations are deemed not less sacred than the true ideas of which he has been the organ: for a time he is made an idol, at the sound of whose name the human intellect is expected to fall down and worship, as the people, nations, and languages were expected, at what time they heard the sound of the flute, harp, sackbut, dulcimer, and all kinds of music, to fall down and worship the golden image which Nebuchadnezzar the king had set up. Happily it is not so easy to take captive the understanding now, when thought is busy on so many subjects in such various domains of Nature, and when an army of investigators often marches where formerly a solitary pioneer painfully sought his way, as it was when the fields of intellectual activity were few and limited, and the laborers in them few also.

A lecture delivered by the Archbishop of York before the Edinburgh Philosophical Institution, which has been pub-

lished as a pamphlet, contains a plain, earnest, and on the whole temperate, but not very closely-reasoned, criticism, from his point of view, of the tendency of modern scientific research, or rather of Positivism, and a somewhat vague declaration of the limits of philosophical inquiry. He perceives with sorrow, but not with great apprehension, that the prospects of philosophy are clouded over in England, France, and Germany, and that a great part of the thinking world is occupied with physical researches. But he does not therefore despair; believing that Positivism indicates only a temporary mood, produced by prostration and lassitude after a period of unusual controversy, and that it will after a time pass away, and be followed by a new era of speculative activity. It may be presumed that men, weary of their fruitless efforts to scale the lofty and seemingly barren heights of true philosophy, have taken the easy path of Positivism, which does not lead upward at all, but leads, if it be followed far enough, to quagmires of unbelief. The facts on which the archbishop bases his opinion, and the steps of reasoning by which he is able thus to couple a period of speculative activity with a period of religious belief, and to declare a system of positive scientific research to be linked inseparably with a system of unbelief, do not appear; they are sufficient to inspire strong conviction in him, but they apparently lie too far down in the depths of his moral consciousness to be capable of being unfolded, in lucid sequence, to the apprehension of others.

To the critical reader of the lecture it must at once occur that a want of discrimination between things that are widely different is the cause of no little looseness, if not recklessness, of assertion. In the first place, the archbishop identifies off-hand the course and aim of modern scientific progress with the Positivism of Comte and his followers. This is very much as if any one should insist on attributing the same character and the same aim to persons who were travelling for a considerable distance along the same road. As it was Comte's great aim to organize a harmonious co-

ordination and subordination of the sciences, he assimilated and used for his purpose the scientific knowledge which was available to him, and systematized the observed method of scientific progress from the more simple and general to the more special and complex studies; but it assuredly is most unwarrantable to declare those who are engaged in physical research to be committed to his conclusions and pretensions, and there can be no question that a philosophy of science, when it is written, will differ widely from the so-called Positive Philosophy.

In the second place, the archbishop unwittingly perpetrates a second and similarly reckless injustice in assuming, as he does, that modern science must needs accept what he describes as the sensational philosophy. "Thus the business of science," he says, "is to gather up the facts as they appear, without addition or perversion of the senses. As the senses are our only means of knowledge, and we can only know things as they present themselves to the eye and ear, it follows that our knowledge is not absolute knowledge of the things, but a knowledge of their relations to us, that is, of our sensations." Passing by the question, which might well be raised, whether any one, even the founder of the sensational philosophy, ever thus crudely asserted the senses to be our only means of knowledge, and our knowledge to be only a knowledge of our sensations; passing by, too, any discussion concerning what the archbishop means, if he means any thing, by an absolute knowledge of things as distinct from a knowledge of things in their relations to us, and all speculations concerning the faculties which finite and relative beings who are not archbishops have of apprehending and comprehending the absolute; it is necessary to protest against the assumption that science is committed to such a representation of the sensational philosophy, or to the sensational philosophy at all. Those modern inquirers who have pushed farthest their physical researches into mental functions and bodily organs have notoriously been at great pains

to discriminate between the nervous centres which minister to sensation and those which minister to reflection, and have done much to elucidate the physical and functional connections between them. They have never been guilty of calling all knowledge a knowledge only of sensations, for they recognize how vague, barren, and unmeaning, are the terms of the old language of philosophical strife, when an attempt is made to apply them with precision to the phenomena revealed by exact scientific observation. The sensorial centres with which the senses are in direct connection are quite distinct from, and subordinate to, the nervous centres of ideation or reflection—the supreme hemispherical ganglia. It is in these, which are far more developed in man than in any other animal, and more developed in the higher than in the lower races of men, that sensation is transformed into knowledge, and that reflective consciousness has its seat. The knowledge so acquired is not drained from the outer world through the senses, nor is it a physical mixture or a chemical compound of so much received from without and so much added by the mind or brain; it is an organized result of a most complex and delicate process of development in the highest kind of organic element in Nature—a mental organization accomplished, like any other organization, in accordance with definite laws. We have to do with *laws of life*, and the language used in the interpretation of phenomena must accord with ideas derived from the study of organization; for assuredly it cannot fail to produce confusion if it be the expression only of ideas derived from the laws of physical phenomena, so far as these are at present known to us. Now, the organization of a definite sensation is a very different matter from, has no resemblance in Nature to, the physical impression made upon the organ of sense, and the organization of an idea is a higher and more complex vital process than the organization of a sensation; to call knowledge, therefore, a knowledge only of sensation is either a meaningless proposition, or, in so far as it has meaning, it is

falser than it would be to affirm the properties of a chemical compound to be those of its constituents. Were they who pursue the scientific study of mind not more thoughtful than the Archbishop of York gives them credit for being, they would have no reason to give why animals with as many senses as man has, and with some of them more acute than his, have not long since attained, like him, to an understanding of the benefits of establishing archbishoprics.

It must be understood that by the assertion of the organic basis of mental function is not meant that the mind imposes the laws of its own organization; on the contrary, it obeys them, knowing not whence they come nor whither they tend. Innate ideas, fundamental ideas, categories of the understanding, and like metaphysical expressions, are obscure intimations of the laws of action of the internal organizing power under the conditions of its existence and exercise; and it is easy to perceive that a new and higher sense conferred on man, altering entirely these conditions, would at once render necessary a new order of fundamental ideas or categories of the understanding. That all our knowledge is relative cannot be denied, unless it be maintained that in that wonderful organizing power which cometh from afar there lies hidden that which may be intuitively revealed to consciousness as absolute knowledge—that the nature of the mysterious power which inspires and impels evolution may, by a flash of intuitive consciousness, be made manifest to the mind in the process of its own development. If Nature be attaining to a complete self-consciousness in man, far away from such an end as it seems to be, it is conceivable that this might happen; and if such a miraculous inspiration were thus to reveal the unknown, it would be a revelation of the one primeval Power. Clearly, however, as positive scientific research is powerless before a vast mystery—the whence, what, and whither, of the mighty power which gives the impulse to evolution—it is not justified in making any proposition regarding it. This, however, it may rightly

do; while keeping its inquiries within the limits of the knowable, it may examine critically, and use all available means of testing, the claims and credentials of any professed revelation of the mystery. And it is in the pursuit of such inquiries that it would have been satisfactory to have had from the archbishop, as a high-priest of the mystery, some gleam of information as to the proper limits which he believes ought to be observed. At what point is the hitherto and no farther to which inquiry may advance in that direction? Where do we reach the holy ground when it becomes necessary to put the scientific shoes from off our feet? There must assuredly be some right and duty of examination into the evidence of revelations claiming to be Divine; for, if it were not so, how could the intelligent Mussulman ever be, if he ever is, persuaded to abandon the one God of his faith, and to accept what must seem to him the polytheism of the Christian Trinity?

Another error, or rather set of errors, into which the archbishop plunges, is that he assumes positive science to be materialistic, and materialism to involve the negation of God, of immortality, and of free will. This imputation of materialism, which ought never to have been so lightly made, it is quite certain that the majority of scientific men would earnestly disclaim. Moreover, the materialist, as such, is not under any logical constraint whatever to deny either the existence of a God, or the immortality of the soul, or free will. One is almost tempted to say that in two things the archbishop distances competition: first, in the facility with which he loses or dispenses with the links of his own chain of reasoning; and, secondly, in his evident inability to perceive, when looking sincerely with all his might, real and essential distinctions which are at all subtile, which are not broadly, and almost coarsely, marked. If the edge of a distinction be fine, if it be not as blunt as a weaver's beam, it fails seemingly to attract his attention. Whosoever believes sincerely in the doctrine of the resurrection of the body, as taught by

the Apostle Paul, which all Christians profess to do, must surely have some difficulty in conceiving the immortality of the soul apart from that of the body; for, if the apostle's preaching and the Christian's faith be not vain, and the body do rise again, then it may be presumed that the soul and it will share a common immortality, as they have shared a common mortality. So far, then, from materialism being the negation of immortality, the greatest of the apostles, the great Apostle of the Gentiles, earnestly preached materialism as essential to the life which is to come. There is as little or less justification for saying that materialism involves of necessity the denial of free will. The facts on which the doctrine of free will is based are the same facts of observation, whether spiritualism or materialism be the accepted faith, and the question of their interpretation is not essentially connected with the one or the other faith; the spiritualist may consistently deny, and the materialist consistently advocate, free will. In like manner, the belief in the existence of God is nowise inconsistent with the most extreme materialism, for the belief is quite independent of the facts and reasons on which that faith is founded. The spiritualist may deny God the power to make matter think, but the materialist need not deny the existence of God because he holds that matter may be capable of thought. Multitudes may logically believe that mind is inseparable from body in life or death—that it is born with it, grows, ripens, decays, and dies with it, without disbelieving in a great and intelligent Power who has called man into being, and ordained the greater light to rule the day and the lesser light to rule the night.

What an unnecessary horror hangs over the word materialism! It has an ugly sound and an indefinite meaning, and is well suited, therefore, to be set up as a sort of moral scarecrow; but, if it be closely examined, it will be found to have the semblance of something terrible, and to be empty of any real harm. In the assertion that mind is altogether a function of matter, there is no more actual irreverence than in

asserting that matter is the realization of mind; the one and the other proposition being equally meaningless so far as they postulate a knowledge of any thing more than phenomena. Whether extension be visible thought, or thought invisible extension, is a question of a choice of words, and not of a choice of conceptions. To those who cannot conceive that any organization of matter, however complex, should be capable of such exalted functions as those which are called mental, is it really more conceivable that any organization of matter can be the mechanical instrument of the complex manifestations of an immaterial mind? Is it not as easy for an omnipotent power to endow matter with mental functions as it is to create an immaterial entity capable of accomplishing them through matter? Is the Creator's arm shortened, so that He cannot endow matter with sensation and ideation? It is strangely overlooked by many who write on this matter, that the brain is not a dead instrument, but a living organ, with functions of a higher kind than those of any other bodily organ, insomuch as its organic nature and structure far surpass those of any other organ. What, then, are those functions if they are not mental? No one thinks it necessary to assume an immaterial liver behind the hepatic structure, in order to account for its functions. But so far as the nature of nerve and the complex structure of the cerebral convolutions exceed in dignity the hepatic elements and structure, so far must the material functions of the brain exceed those of the liver. Men are not sufficiently careful to ponder the wonderful operations of which matter is capable, or to reflect on the miracles effected by it which are continually before their eyes. Are the properties of a chemical compound less mysterious essentially because of the familiarity with which we handle them? Consider the seed dropped into the ground: it swells with germinating energy, bursts its integuments, sends upward a delicate shoot, which grows into a stem, putting forth in due season its leaves and flowers, until finally a beautiful structure is formed, such as Solomon in all his glory could not

equal, and all the art of mankind cannot imitate. And yet all these processes are operations of matter; for it is not thought necessary to assume an immaterial or spiritual plant which effects its purposes through the agency of the material structure which we observe. Surely there are here exhibited properties of matter wonderful enough to satisfy any one of the powers that may be inherent in it. Are we, then, to believe that the highest and most complex development of organic structure is not capable of even more wonderful operations? Would you have the human body, which is a microcosm containing all the forms and powers of matter organized in the most delicate and complex manner, to possess lower powers than those forms of matter exhibit separately in Nature? Trace the gradual development of the nervous system through the animal series, from its first germ to its most complex evolution, and let it be declared at what point it suddenly loses all its inherent properties as living structure, and becomes the mere mechanical instrument of a spiritual entity. In what animal, or in what class of animals, does the immaterial principle abruptly intervene and supersede the agency of matter, becoming the entirely distinct cause of a similar, though more exalted, order of mental phenomena? To appeal to the consciousness of every man for the proof of a power within him, totally distinct from any function of the body, is not admissible as an argument, while it is admitted that consciousness can make no observation of the bodily organ and its functions, and until therefore it be proved that matter, even when in the form of the most complex organization, is incapable of certain mental functions. Why may it not, indeed, be capable of consciousness, seeing that, whether it be or not, the mystery is equally incomprehensible to us, and must be reckoned equally simple and easy to the Power which created matter and its properties? When, again, we are told that every part of the body is in a constant state of change, that within a certain period every particle of it is renewed, and yet that amid these changes a man feels that he

remains essentially the same, we perceive nothing inconsistent in the idea of the action of a material organ; for it is not absurd to suppose that in the brain the new series of particles take the pattern of those which they replace, as they do in other organs and tissues which are continually changing their substance yet preserve their identity. Even the scar of a wound on the finger is not often effaced, but grows as the body grows: why, then, assume the necessity of an immaterial principle to prevent the impression of an idea from being lost?

The truth is, that men have disputed vaguely and violently about matter and motion, and about the impossibility of matter affecting an immaterial mind, never having been at the pains to reflect carefully upon the different kinds of matter and the corresponding differences of kind in its motions. All sorts of matter, diverse as they are, were vaguely *matter*—there was no discrimination made; and all the manifold and special properties of matter were comprised under the general term *motion*. This was not, nor could it lead to, good; for matter really rises in dignity from physical matter in which physical properties exist to chemical matter and chemical forces, and from chemical matter to living matter and its modes of force; and then in the scale of life a continuing ascent leads from the lowest kind of living matter with its force or energy, through different kinds of physiological elements with their special energies or functions, to the highest kind of living matter with its force—viz., nerve-matter and nerve-force; and, lastly, through the different kinds of nerve-cells and their energies to the most exalted agents of mental function. Obviously, then, simple ideas derived from observation of mechanical phenomena cannot fitly be applied to the explanation of the functions of that most complex combination of elements and energies, physical and chemical, in a small space, which we have in living structure; to speak of mechanical vibration in nerves and nerve-centres is to convey false ideas of their extremely delicate and complex energies,

and thus seriously to hinder the formation of more just conceptions.

In like manner, much barren discussion has been owing to the undiscriminating inclusion of all kinds of mental manifestations under the vague and general term *mind;* for there are most important differences in the nature and dignity of so-called mental phenomena, when they are properly observed and analyzed. Those who have not been at the pains to follow the order of development of mental phenomena and to make themselves acquainted with the different kinds of functions that concur to form what we call mental action, and who have not studied the differences of matter, are doing no better than beating the air when they disclaim against materialism. By rightly submitting the understanding to facts, it is made evident that, on the one hand, matter rises in dignity and function until its energies merge insensibly into functions which are described as mental, and, on the other hand, that there are gradations of mental function, the lowest of which confessedly do not transcend the functions of matter. The burden of proving that the *Deus ex machinâ* of a spiritual entity intervenes somewhere, and where it intervenes, clearly lies upon those who make the assertion or who need the hypothesis. They are not justified in arbitrarily fabricating an hypothesis entirely inconsistent with experience of the orderly development of Nature, which even postulates a domain of Nature that human senses cannot take any cognizance of, and in then calling upon those who reject their assumption to disprove it. These have done enough if they show that there are no grounds for and no need of the hypothesis.

Here we might properly take leave of the archbishop's address, were it not that the looseness of his statements and the way in which his understanding is governed by the old phrases of philosophical disputes tempt further criticism, and make it a duty to expose aspects of the subject of which he does not evince the least apprehension. He would, we ima-

gine, be hard put to it to support the heavy indictment contained in the following sentence which he flings off as he goes heedlessly forward: "A system which pretends to dispense with the ideas of God, of immortality, of free agency, of causation, and of design, would seem to offer few attractions." The question of the value of any system of philosophy is not, it may be observed incidentally, whether it is unattractive because it dispenses with received notions, still less because its adversaries imagine that it must dispense with them; but it is whether it possesses that degree of fundamental truth which will avail to enlarge the knowledge and to attract ultimately the belief of mankind. History does not record that the doctrines of Christianity were found attractive by the philosophers of Greece or Rome when they were first preached there; does, indeed, record that Paul preaching on Mars' Hill at Athens, the city of intellectual enlightenment, and declaring to the inhabitants the unknown God whom they ignorantly worshipped, made no impression, but found it prudent to depart thence to Corinth, nowise renowned at that time as a virtuous city, renowned, indeed, in far other wise. We have not, however, quoted the foregoing sentence in order to repudiate popular attractiveness as a criterion of truth, but to take occasion to declare the wide difference between the modest spirit of scientific inquiry and the confident dogmatism of the so-called Positive Philosophy. Science, recognizing the measure of what it can impart to be bounded by the existing limits of scientific inquiry, makes no proposition whatever concerning that which lies beyond these limits; equally careful, on the one hand, to avoid a barren enunciation in words of what it cannot apprehend in thought, and, on the other hand, to refrain from a blind denial of possibilities transcending its means of research. A calm acquiescence in ignorance until light comes is its attitude. It must be borne clearly in mind, however, that this scrupulous care to abstain from presumptuous assertions does not warrant the imposition of any arbitrary barrier to the

reach of its powers, but is quite consistent with the conviction of the possibility of an invasion and subjugation of the unknown to a practically unlimited extent, and with the most strenuous efforts to lessen its domain.

The wonder is—and the more it is considered the greater it seems—that human intelligence should ever have grown to the height either of affirming or of denying the existence of a God. Certainly the denial implies, even if the affirmation does not also, the assumption of the attributes of a God by him who makes it. Let imagination travel unrestrained through the immeasurable heavens, past the myriads of orbs which, revolving in their appointed paths, constitute our solar system, through distances which words cannot express nor mind conceive definitely, to other suns and other planetary systems; beyond these glimmer in the vast distance the lights of more solar systems, whose rays, extinguished in the void, never reach our planet: still they are not the end, for as thought in its flight leaves them behind, and they vanish in remote space, other suns appear, until, as the imagination strives to realize their immensity, the heavens seem almost an infinite void, so small a space do the scattered clusters of planets fill. Then let sober reflection take up the tale, and, remembering how small a part of the heavenly hosts our solar system is, and how small a part of our solar system the earth is, consider how entirely dependent man, and beast, and plant, and every living thing are upon the heat which this our planet receives from the sun; how vegetation flourishes through its inspiring influence, and the vegetation of the past in long-buried forests gives up again the heat which ages ago it received from the sun; how animal life is sustained by the life of the vegetable kingdom, and by the heat which is received directly from the sun; and how man, as the crown of living things, and his highest mental energy, as the crown of his development, depend on all that has gone before him in the evolution of Nature—considering all these things, does not living Nature appear but a small

and incidental by-play of the sun's energies? Seems it not an unspeakable presumption to affirm that man is the main end and purpose of creation? Is it not appalling to think that he should dare to speak of what so far surpasses the reach of his feeble senses, and of the power which ordains and governs the order of events—impiously to deny the existence of a God, or not less impiously to create one in his image? The portion of the universe with which man is brought into relation by his existing sentiency is but a fragment, and to measure the possibilities of the infinite unknown by the standard of what he knows is very much as if the oyster should judge all Nature by the experience gained within its shell—should deny the existence on earth of a human being, because its intelligence cannot conceive his nature or recognize his works. Encompassing us and transcending our ken is a universe of energies; how can man, then, the "feeble atom of an hour," presume to affirm whose glory the heavens declare, whose handiwork the firmament showeth? Certainly true science does not so dogmatize.

Bacon, in a well-known and often-quoted passage, has remarked, that "a little philosophy inclineth men's minds to Atheism, but depth in philosophy bringeth men's minds about to religion; for while the mind of man looketh upon second causes scattered, it may sometimes rest in them, and go no further; but when it beholdeth the chain of them, confederate and linked together, it must needs fly to Providence and Deity." It is not easy to perceive, indeed, how modern science, which makes its inductions concerning natural forces from observation of their manifestations, and arrives at generalizations of different forces, can, after observation of Nature, avoid the generalization of an intelligent mental force, linked in harmonious association and essential relations with other forces, but leading and constraining them to higher aims of evolution. To speak of such evolution as the course of Nature is to endow an undefined agency with the properties which are commonly assigned to a god, whether it be

called God or not. The nature, aim, and power of this supreme intelligent force, working so far as we know from everlasting to everlasting, it is plainly impossible that man, a finite and transient part of Nature, should comprehend. To suppose him capable of doing so, would be to suppose him endowed with the very attributes which, having only in part himself, he ascribes in the whole to Deity.

Whether the low savage has or has not the idea of a God is a question which seems hardly to deserve the amount of attention which it has received. It is certain that he feels himself surrounded and overruled by forces the natures and laws of which he is quite ignorant of, and that he is apt to interpret them, more or less clearly, as the work of some being of like passions with himself, but vastly more powerful, whom it is his interest to propitiate. Indeed, it would appear, so far as the information of travellers enables us to judge, that the idea entertained of God by the savage who has any such idea is nearly allied to that which civilized people have or have had of a devil; for it is the vague dread of a being whose delight is in bringing evil upon him rather than that of a being who watches over and protects him. Being ignorant altogether of the order of Nature, and of the fixed laws under which calamities and blessings alike come, he frames a dim, vague, and terrible embodiment of the causes of those effects which touch him most painfully. Will it be believed, then, that the Archbishop of York actually appeals to the instinct of the savage to rebuke the alleged atheism of science? Let it be granted, however, that the alleged instinct of the savage points to a God and not to a devil ruling the world, it must in all fairness be confessed that it is a dim, undefined, fearful idea—if that can be called an idea which form has none—having no relationship to the conception of a God which is cherished among civilized people. In like manner as the idea of a devil has undergone a remarkable development with the growth of intelligence from age to age, until in some quarters there is evinced a disposition to im-

prove him out of being, so the conception of a God has undergone an important development through the ages, in correspondence with the development of the human mind. The conceptions of God affirmed by different revelations notably reflect, and are an index of, the intellectual and moral character of the people to whom each revelation has been made, and the God of the same religion does unquestionably advance with the mental evolution of the people professing it, being differently conceived of at different stages of culture. Art, in its early infancy, when it is, so to speak, learning its steps, endeavors to copy Nature, and, copying it badly, exaggerates and caricatures it, whence the savage's crude notion of a God; but the aim and work of the highest art is to produce by idealization the illusion of a higher reality, whence a more exalted and spiritual conception of Deity.

Notwithstanding the archbishop's charge of atheism against science, there is hardly one, if indeed there be even one, eminent scientific inquirer who has denied the existence of God, while there is notably more than one who has evinced a childlike simplicity of faith. The utmost claim of scientific skepticism is the right to examine the evidence of a revelation professing to be Divine, in the same searching way as it would examine any other evidence—to endeavor to trace the origin and development, and to weigh the value, of religious conceptions as of other conceptions. It violates the fundamental habit of the scientific mind, the very principle of its nature, to demand of it the unquestioning acceptance of any form of faith which tradition may hand down as divinely revealed. When the followers of a religion appeal, as the followers of every religion do, in proof of it, to the testimony of miraculous events contrary to the experience of the present order of Nature, there is a scientific fact not contrary to experience of the order of Nature which they overlook, but which it is incumbent to bear in mind, viz.: That eager and enthusiastic disciples sometimes have visions and dream dreams, and that they are apt innocently to ima-

gine or purposely to invent extraordinary or supernatural events worthy the imagined importance of the subject, and answering the burning zeal of their faith. The calm observer and sincere interpreter of Nature cannot set capricious or arbitrary bounds to his inquiries at any point where another may assert that he ought to do so; he cannot choose but claim and maintain the right to search and try what any man, Jew or Gentile, Mussulman or Bramin, has declared sacred, and to see if it be true. And, if it be not true to him, what matters it how true it be? The theologian tells him that the limits of philosophical inquiry are where faith begins, but he is concerned to find out where faith does begin, and to examine what sort of evidence the evidence of things unseen is. And if this right of free inquiry be denied him, then is denied him the right to doubt what any visionary, or fanatic, or madman, or impostor, may choose to proclaim as a revelation from the spiritual world.

Toward the close of his lecture the archbishop, breaking out into peroration, becomes violently contemptuous of the philosopher who, "with his sensations sorted and tied up and labelled to the utmost, might," he thinks, "chance to find himself the most odious and ridiculous being in all the multiform creation. A creature so glib, so wise, so full of discourse, sitting in the midst of creation with all its mystery and wonder, and persuading you that he is the master of its secrets, and that there is nothing but what he knows!" It is not very difficult to raise a laugh by drawing a caricature; but it was hardly, perhaps, worthy the lecturer, the subject, and the audience, to exhibit on such an occasion an archiepiscopal talent for drawing caricatures. As we have already intimated, this philosopher, "so glib, so wise, so full of discourse," does not profess to know nearly so much of the mystery and wonder of creation as the archbishop does. There is more flourishing language of the same sort before the discourse ends, but it would be unprofitable to transcribe or criticise it; and it is only right to the lecturer to say that

he is near his conclusion when he works himself up into this vituperative and somewhat hysterical ecstasy. The following passage may be quoted, however, as instructive in more respects than one:

"The world offers just now the spectacle, humiliating to us in many ways, of millions of people clinging to their old idolatrous religions, and refusing to change them even for a higher form; while in Christian Europe thousands of the most cultivated class are beginning to consider atheism a permissible or even a desirable thing. The very instincts of the savage rebuke us. But just when we seem in danger of losing all may come the moment of awakening to the dangers of our loss. A world where thought is a secretion of the brain-gland—where free will is the dream of a madman that thinks he is an emperor, though naked and in chains—where God is not or at least not knowable, such is not the world as we have learned it, on which great lives have been lived out, great self-sacrifices dared, great piety and devotion have been bent on softening the sin, the ignorance, and the misery. It is a world from which the sun is withdrawn, and with it all light and life. But this is not *our* world as it was, not the world of our fathers. To live is to think and to will. To think is to see the chain of facts in creation, and passing along its golden links to find the hand of God at its beginning, as we saw His handiwork in its course. And to will is to be able to know good and evil; and to will aright is to submit the will entirely to a will higher than ours. So that with God alone can we find true knowledge and true rest, the vaunted fruits of philosophy."

Was ever before such a terrible indictment against Christianity drawn by a Christian prelate? Its doctrines have now been preached for nearly two thousand years; they have had the aids of vast armies, of incalculable wealth, of the greatest genius and eloquence; they are embodied in the results of conquests, in the sublimest works of art, in some of the noblest specimens of oratory, in the very organization of modern society; thousands upon thousands have died martyrs to their faith in them, and thousands more have been made martyrs for want of faith in them; they have been carried to the darkest places of the earth by the vehicles of commerce, have been proclaimed by the messengers and

backed by the moral power of a higher civilization; they are almost identified with the spirit and results of modern scientific progress: all these advantages they have had, and yet the archbishop can do no more than point to the spectacle of millions of people clinging to their old idolatrous religions, and to thousands of the most cultivated class in Christian Europe who are beginning to consider atheism a permissible or even a desirable thing! Whether it be really true that so many of the cultivated class in Europe are gravitating toward atheism we cannot say; but, if the allegation be true, it may well be doubted whether an appeal to the instincts of the savage who persists in clinging to his idolatry will avail to convince them of their error. It is not very consistent on the archbishop's part to make such an appeal, who in another paragraph of his lecture emphatically enjoins on philosophy not to banish God, freedom, duty, and immortality from the field of its inquiries, adjuring it solemnly never to consent to abandon these highest subjects of study.

Another comment on the passage above quoted which suggests itself is that men have undergone great self-sacrifices, sufferings, and death, for a bad cause with as firm and cheerful a resolution as good men have for the best cause; to die for a faith is no proof whatever of the truth of it, nor by any means always the best service which a man may render it. Atheism counts its martyrs as well as Christianity. Jordano Bruno, the friend of Sir Philip Sidney, was condemned for atheism, sentenced to death, and, refusing to recant, burned at the stake. Vanini, who suffered death as an atheist, might have been pardoned the moment before his execution if he would have retracted his doctrines; but he chose to be burned to ashes rather than retract. To these might be added others who have gone through much persecution and grievous suffering for a cause which the Archbishop of York would count the worst for which a man could suffer. How many Christians of one sect have undergone lingering tortures and cruel deaths at the hands of Christians of another

sect for the sake of small and non-essential points of doctrine in which only they differed—for points at issue so minute as to "be scarcely visible to the nicest theological eye!" Christianity has sometimes been a terrible war-cry, and it must be confessed that Christians have been good persecutors. When the passions of men have worked a faith into enthusiasm, they will suffer and die, and inflict suffering and death, for any cause, good or bad. The appeal to martyrdom of professors is therefore of small worth as an argument for the truth of their doctrine. Pity 'tis that it is so, for, if it were otherwise, if self-sacrifice in a cause would suffice to establish it, what a noble and powerful argument in support of the Christian verities might archbishops and bishops offer, in these sad times of luxury and unbelief when so many are lapsing into atheism!

But we must bring to an end these reflections, which are some of those that have been suggested by the perusal of the archiepiscopal address on the "Limits of Philosophical Inquiry." Though heavy charges are laid against modern science, they are made in a thoughtless rather than a bitter spirit, while the absence of bigotry and the general candor displayed may justify a hope that the author will, on reflection, perceive his opinions to require further consideration, and his statements to be too indiscriminate and sweeping. On the whole there is, we think, less reason to apprehend harm to scientific inquiry from this discharge of the archbishop's feelings, than to apprehend harm to those who are obstinately defending the religious position against the attack which is thought imminent. For he has used his friends badly: he has exposed their entire flank to the enemy; while he would distinctly have philosophy concern itself with the highest subjects—God, freedom, and immortality—despising a philosophy which forbears to do so, and pointing out how miserably it falls short of its highest mission, he warns philosophy in the same breath that there is a point at which its teaching ends.

"Philosophy, while she is teaching morals and religion, will soon come to a point where her teaching tends. . . She will send her scholars to seek in revelation and practical obedience the higher culture that she can only commence."

The pity of the matter is, that we are not furnished with a word of guidance as to where the hitherto and no farther point is. With brave and flourishing words he launches the inquirer on a wide waste of waters, but without a rudder to guide him, or a compass to steer by. Is he to go on so long as what he discovers is in conformity with the Gospel according to the Thirty-nine Articles, but furl to his sails, cease his exertions, and go down on his knees, the moment his discoveries clash with the faith according to the Thirty-nine Articles? What guarantee have we that he will be content to do so? In withholding the Scriptures from the people, and shutting off philosophy entirely from the things that belong to faith, the Church of Rome occupies a strong and almost impregnable position; for, if there be no reading there will be no inquiry, and if there be no inquiry there will be no doubt, and if there be no doubt there will be no disbelief. But the union of philosophical inquiry and religious faith is not a natural union of kinds; and it is difficult to see how the product of it can be much different from the hybrid products of other unnatural unions of different kinds—can be other than sterile, when it is not monstrous.

THE END.