Mr. President and Gentlemen, within the limits of the time which I feel myself entitled to occupy, I am unable to prolong further my remarks, which, however, such as they are, may, it is hoped, be considered worthy of attention. The facts and figures adduced must be left to speak for themselves. Only, if the general feeling should be in accordance with my own, that we have in these collective results, at least, the "promise and potency" of reliable and useful knowledge, it may not be out of place if I urge that it behoves us to give increasing diligence, care and labour to the collection of the facts upon which these tables are founded, as a matter of serious obligation. If in such a spirit the causes of insanity in our cases are sought after and recorded by us I, for one, shall have no fear for the result. Gradually our previous deductions will be confirmed, corrected or modified; our conclusions will go on increasing in reliableness and value; and, perhaps, in time our reproach in this matter, for such I have long considered it to be, may be blotted out.

The Data of Alienism. By CHARLES MERCIER, M.B.

IV.

THE BODILY HEALTH.

At a time when Insanity is commonly looked on as a bodily disease; when the only aspect of it that receives systematic study is that of disturbed bodily function; when a leading neurologist speaks of the mind as "a force evolved from the brain;" when the main difficulty in the exposition of the facts of insanity lies in procuring an acknowledgment that there is anything besides the bodily health to be studied; little insistence need be laid on the importance of a systematic and methodical examination of the condition of the bodily functions in cases of Insanity.

Not every aberration of bodily function, however, has a significance for the alienist. The existence of an epithelioma of the lip, of a broken arm, a contracted cardiac valve or orifice, of a hernia, an aneurism, or a local inflammation, has, or may have, no bearing whatever on the question of the sanity of the person in whom it occurs, and may be altogether left out of consideration in studying that question. So that, however thorough and searching may be the schemes that physicians have drawn up for the investigation of the bodily

functions from their point of view and for their purposes, it by no means follows that those schemes will be suitable for the investigation of cases of insanity. Nay, by reason of their thoroughness, they must be, to a large extent, unsuitable, since, the more comprehensive they are, the more numerous will be the facts that do not concern the question of sanity that they include.

On the other hand, there are many facts of bodily functions which, since they give indications more or less direct of the physical and physiological activity of the highest nerve-centres, have a very important significance for the alienist, and yet have but little attention bestowed on them by physicians, to whom, indeed, they are of subordinate interest and importance. Such considerations are the precise origin, march, and character of an epileptic paroxysm, and the nature of the actions that follow it. Moreover, of the signs and symptoms of bodily disorder which concern both the physician and the alienist, many have very different meanings, according as they are seen from the point of view of the one or from that of the other. A chilblain, for instance, is to the physician a trifling matter. He looks on it as a source of discomfort, perhaps of actual pain; but since it involves no danger to life or limb, and very rarely incapacitates from employment, it attracts but a very small share of his notice. Even if he takes it as an indication of debility or, "low vitality," he does not need to greatly concern himself about it. In short, a chilblain on a patient's limb, a simple chilblain is to him, and it is nothing more. But when an alienist has to treat a person of weak mind, and finds her hands a mass of chilblains, he has obtained a fact of the utmost significance. This observation is in the forefront of the data whence he derives his prognosis, which is now many degrees less favourable than it would otherwise have been. Conversely, when a physician is consulted by a patient who has defect of speech and weakness of the right arm and leg, he is confronted by a malady of great gravity—one which will tax all his resources to investigate, and all his skill to treat; but to the alienist this group of symptoms has no special significance. Its meaning to him is that the patient has suffered damage of certain of his instruments for acting; but his defect of speech does not necessarily mean a disorder of the process of adjusting himself to his environment, any more than his defect of movement of arm or leg means such disorder. All it signifies is that he has lost

certain means and methods of carrying out the adjustment.

It is, of course, true that in the great majority of cases an alienist acts as a physician also; but the two sets of duties are no more on that account the same than the duties of Prime Minister and Chancellor of the Exchequer are the same because they were recently discharged by the same individual. The kinds of work of the two departments are not only distinct, but must be clearly distinguished and kept apart if either is to be properly done. It is true that the existence of insanity, if it do not actually produce, certainly does not prevent the occurrence, in the person so affected, of the various bodily ills the flesh is heir to. The lunatic is "fed with the same food, hurt with the same weapons, subject to the same diseases, healed by the same means, warmed and cooled by the same summer and winter," as a sane person; and these bodily affections it commonly falls to the alienist to treat. But their investigation and treatment form no part of his special function. He treats them, not because he is an alienist, but because he happens to be a physician as well. And although these bodily affections in many cases do not run precisely the same course, and are not attended by precisely the same manifestations as commonly occur in the sane—although the lunatic, as Dr. Bucknill says, is a lunatic to his fingers' ends, and, as Mr. Darwin says, to the extremity of each particular hair—although disorder of the highest nervous processes affects the nutrition, and therefore the function, of every portion of the body—yet in estimating these bodily functions, with a view to their rectification, the condition of the highest nervous processes is considered not *per se*, but as an extrinsic disturbing influence, just as the climatic conditions, or the sequelæ of a former disease might be taken into account. It is considered, in short, from the point of view of the physician, not from that of the alienist. Only when we deal with the question—What is the influence of this bodily state on the highest nervous processes? or with the other question—What condition of the highest nervous processes does this bodily symptom indicate? are we dealing with the problems of alienism.

From the foregoing considerations, it appears that variations of the bodily functions have a significance to the alienist very different from that which they have to the physician; but the importance of a given variation in the estimation of the former bears no relation to its importance in the estimation of the latter; and that a scheme of investi-

gation which is adapted to the requirements of the one, must for that very reason fail to satisfy the requirements of the other. For the just estimation of the facts of bodily function, and for their relegation to an appropriate position among the data of alienism, it is necessary therefore to formulate a scheme of investigation different from that of the physician, and having reference to the special end in view.

From a purely physical aspect, the organism is an apparatus which absorbs and distributes matter and force; and its functions admit of a broad and sweeping division according as they subserve the redistribution of matter or the redistribution of force. While it is, of course, true that the rearrangement of matter is always effected by the redistribution of force, and that the redistribution of force is always accompanied by the rearrangement of matter, and that these conditions are as inseparably linked within the organism as without it; yet, since one portion of this duplex process is in every case primary while the other is merely subsidiary, the distinction between the two is thoroughly valid. That this division of the functions follows an actual line of cleavage which penetrates to the very foundation of the constitution of the organism, is indicated not more by *a priori* considerations than by the multitude and importance of the minor lines of difference that it passes through, coincides with, and connects; and of the complementary factors that it refers to the one side and the other. The functions which subserve the reception and redistribution of matter are those by which the organism exists, while the functions which subserve the reception and redistribution of force are those by which it acts. The first are the so-called vegetative functions; the second are those which are more conspicuously indicative of animal life. The continuance of the first are essential to the continuance of life. Stop the heart, and the man drops dead; arrest the breathing, and he dies rapidly; abolish the function of the kidney—block the intestine—and he has but a few days to live. But the functions of the second group may be abolished *seriatim* without directly or necessarily affecting the duration of life. Blindness or deafness is no bar to longevity. Many a paraplegic lives to advanced life, and if his malady is fatal, it is so not because of the loss of movement, but because of the nutritive changes that accompany the loss. So with hemiplegia, with tabes, with muscular atrophy, with chorea, and with all other dis-

orders of movement, life is not threatened except by the concomitant changes of nutrition or by the invasion of the functions of the first order. Again, the redistribution of matter is continuous; the redistribution of force is intermittent. The blood never ceases to circulate; the interchange of gases in the lungs is never interrupted; the structural changes of growth and development, waste and repair, nutrition, excretion and assimilation, are continually going on. In sleep and in waking, in activity and in repose, day and night, year after year, the structure changes ceaselessly. In life these changes never cease, and when life ends they merge without a break into the final redistribution that takes place after death. But the redistributions of force are not continuous; they occur only at intervals. In the separate pulsations of the heart, in the composition of a muscular contraction, in the to and fro movements of breathing, in the undulations of peristalsis, in the fatigue and repose that follow exertion, in the sleep that alternates with waking life, we see exemplified the irrefragable law that within the organism the redistribution of force is always intermittent—conforms always to that greater law which asserts throughout the universe of Space and Time the rhythm of all motion. Yet, again, while the redistribution of force is the primary function of the highest nervous centres, the redistribution of matter is altogether independent of their direct control. Which of us by taking thought can add a cubit to his stature? or determine the deposition of fat in this place or the absorption of fluid from that? Who can check the proliferation of cells which is forming a cancer in this part, or keep up to the normal standard the defective nutrition which is resulting in atrophy in that? On the other hand not only are the redistributions of force which affect the outward movements of the organism under the control of these centres; not only are the movements of locomotion, handicraft, and speech the direct outcome of their activity, but even the redistributions of force which subserve those of matter—the movements of the digestive, respiratory, and circulatory apparatus—are more or less under their direct control. Differences so pervading and so fundamental fully justify the division of the functions into these two orders.

As the organism must exist before it can act—as in the course of our investigation we have found it necessary to consider it as existing at rest before considering the actions and reactions between it and the environment—an obvious

extension of the same principle will render advisable the consideration of the functions by which it exists as a preliminary to the consideration of those by which it acts. Insomuch as the great statical functions with which the investigation begins, and by virtue of which the organism exists, underlie and are presupposed by the dynamical functions—since the functions of the first class are the most general of all the functions, while the highest nervous processes, in which the dynamical functions culminate, and with which the inquiry terminates, are the most highly special of all the functions, it will tend to preserve the continuity of thought if all the bodily processes are considered in the order of decreasing generality and increasing speciality. By this means we obtain a concept based on the widest foundation and gradually attaining the highest precision. Moreover, in the detailed investigation of separate organs a further application of the principle stated will involve the expediency of considering the statical aspect before the dynamical, of estimating first the structure and then the function.

Although absent at the dawn of life, and preceded by several other tissues, both in the primitive living forms from which man traces his long line of descent, and in the development of the individual germ; yet in man the most general, the least differentiated, of all the tissues is unquestionably the Blood. It may be regarded as potentially holding every tissue in solution, since molecule by molecule they fall into its current and are swept away, and at the same time they are continuously reconstructed out of the material that it supplies. To the alienist its condition is important, not only because the nutrition of the highest nervous centres, which is the proximate end of his investigations, depends on its wealth in appropriate materials, but because the presence of certain substances in the blood passing through the brain directly produces alienation. Variations in the composition of the blood may for our purposes be said to be of two kinds—one in which some normal component of the blood is deficient in quantity; the other in which there is either an excessive quantity of some normal component or there is added some altogether foreign material. If there is deficiency in the blood of a normal component, then all the tissues to whose nutrition that component contributes must be imperfectly nourished, and if imperfectly nourished, must work inefficiently. In every case in which such a state of blood exists, the nervous centres will suffer a

lack of nutrition, and will display this lack by imperfect function. Hence we find that in chlorosis, in oligocythæmia, in aglobulism, in anæmia, there is always under-activity. The total movement of the organism is less than normal, showing general defect of nervous discharge. Corresponding with this bodily symptom there is the Feeling of languor, and on the intellectual side of Mind there is that slight degree of hebetude which shows itself in sluggishness and defective range of thought. Such people are dull; they "take no interest in things;" their attention is not aroused quite so readily as is normal, nor maintained quite so long; they are "apathetic." When you find them sitting lumpishly, staring before them with a vacant expression, and ask them of what they are thinking, they rouse up and answer, "Nothing," and this is no doubt approximately true. Now what is the meaning of all this? What general condition of Mind does it indicate? *It means that consciousness is defective;* that mental states and processes are less vivid than normal; that the tide of feeling is at its ebb; that there is a slight degree of what, if carried to the full extent, would be loss of consciousness. Then if a certain lack of these components in the blood bathing the highest nervous centres is attended by defects of consciousness, with a greater deficiency of them, consciousness will be altogether lost? Certainly it will. If the movement of the blood be arrested, so that no more supplies arrive to take the place of that which has been emptied of its pabulum, consciousness will cease; and we know that in syncope consciousness does cease. Hence it is, in a rigorous scientific sense, as literally true to say that an anæmic person is to a certain extent alienated as it is to say that when I move my hand to my head I shift the centre of gravity of the earth. The immediate practical consequences of the aberration are certainly not very much more important in the one case than in the other, but the value of a fact to science and to humanity does not depend on the magnitude of its immediate practical consequences. The discovery of the Law of Gravitation did not, as far as we know, cause much excitement among the farmers of the seventeenth century, nor much rejoicing among the proletariat; yet, apart from its value as pure knowledge, it has taken an important part, through the improvements in navigation that have been effected by its means, in bringing a cheap loaf to the door of every cottager in the kingdom. The view of disease that regarded it as a separate entity that jumped into a man

from outside, has become extinct, together with the belief in other demoniacal manifestations. We now know that among the variations of the processes of life there are no differences in kind. All the processes of disease are but deviations in degree from the processes of health. Every disorder has its physiological counterpart, of which it is an exaggeration. There is nothing new under the skin.* If, then, we would discover the how and the why of this disorder, shall we best do so by confining our attention to the full-blown malady, or shall we trace its manifestations backwards to the point at which the first trivial deviation from the normal can be recognised? If we would discover the source of a river, whether is it better to sit down and watch the broad stream rolling past us, guessing at its origin from the *débris* that it throws up at our feet, or to follow it up to where its remotest tributary trickles from the rocks? If we want to discover the mode in which a plant developes, shall we carefully root out and discard the seedlings, and confine our attention to the full-grown tree? Surely not. What would be thought of a farmer who spent abundance of time, money, and trouble in extirpating a phylloxera or a Colorado beetle, but refused to concern himself about the eggs, because they were so little, and did no harm? Would he not be thought a fit person to occupy our attention? Why, then, should we regard every trivial defect of consciousness, every temporary aberration of conduct, every form of delirium, every case of drunkenness, every occurrence of vertigo, every "absence of mind," every temporary listlessness or irritability, or despondency as an affair with which the alienist has no concern? Should we not rather study these things with special care, as the biologist studies the amœba, because they show in the simplest and most easily analysed form those phenomena which are elsewhere presented in such inextricable complexity? But the trivial alienation of anæmia goes no further—never developes into actual insanity or dementia? No, nor does the free amœba develope into a vertebrate. In the one case as in the other, the process of development stops short at an early stage, and presents for our study a *permanent larval form.* It is not too much to say that it is of far more importance to study such nascent and intermediate forms than to study the phenomena in

* Without desiring to claim a shred of priority for this doctrine, it is only fair to say that the whole of this article was written, and in the hands of the Editors of the Journal, several months before Dr. Creighton's admirable Address in Pathology was published.

their full development. If biologists had rejected the study of invertebrate animals as unimportant, we should not now know much about the development of vertebrates; and when alienists speak of the difficulty of the study of insanity after having laboriously framed their definitions so as to exclude these larval forms of alienation, they are in the position of men who have wilfully blocked up their windows and then complain of want of light.

In the various forms of anæmia, then, we are confronted with a derangement of the function of the highest nervous centres which is not only very slight in degree, but which is the simplest possible form of derangement—a pure deficiency of action.

The presence of abnormal materials, or of abnormal quantities of normal materials, in the blood bathing the highest nervous centres, gives rise to aberrations of a different, and commonly of a much more prominent character. Among the foreign materials that occasionally gain access by means of the blood to the elements of the central nervous system, are lead, mercury, arsenic, and other metals, opium, belladonna, stramonium, and other vegetable products; alcohol and its allies; chloroform and ether; the poisons of the specific fevers, of malaria, of hydrophobia, and perhaps of tetanus. Among the normal constituents of the blood whose presence in abnormal quantity may disorder the action of the highest nervous centres, are carbonic acid, the poisons of gout and of uræmia, whatever they may be; sugar, cholesterine, and perhaps other waste products.

The manifestations of the action of alcohol and of anæsthetics upon the organism are of enormous importance to the study of insanity, since by them we can artificially produce alienation of any degree, from a trifling confusion of thought and unsteadiness of hand, through the various stages of maniacal excitement, to the profoundest coma, with total loss of consciousness and of voluntary movement, or even to complete ablation of the functions of the nervous system in death. There is no form of mania that occurs among the inmates of lunatic asylums that may not be exhibited by a drunken man. Violent, destructive, amorous, maudlin, dolorous, lachrymose, or what not; subject to illusion, hallucination, delusion, imbecility, whatever disorder of Feeling, Intellect, or Conduct can be discovered in a lunatic, has its counterpart, allowing for individual differences, in some cases of drunkenness. And the stertorous coma into which the drunkard at last subsides is identical

in form with the coma which marks the closing stage of a fatal maniacal attack. This being so, it is astonishing that the occurrences in drunkenness have not of late years been scientifically investigated, and it behoves the students of insanity to bestir themselves betimes, before all opportunity for this most important study is abolished by Sir Wilfrid Lawson and his disciples. Just as, by the uniform character of the delirium produced by belladonna, we are shown that the same substance acts similarly on the nerve centres of different people,; so by the multiformity of the symptoms that follow the ingestion of the same amount of alcohol by different people we see the share taken by the inherent disposition of a man in determining what form, if he becomes insane, his insanity shall assume.

Delirium, which is, of course, a form of alienation, although from its transient duration and assignable cause it is not clinically considered as insanity, is common in the course of the specific fevers. When it occurs at the climax of the fever, it may be due to the high temperature; and when it occurs toward the end, it may be considered due to the waste of the highest nervous centres concurrent with the general waste; but when it occurs at the outset of the malady, it can have no other cause than the presence of the poison in the blood and the action of this poison on the brain. It is a very noteworthy fact that the invasion of the organism by a specific poison is usually announced by the excessive discharge of some nervous centre or group of centres. Ordinarily the vaso-motor and its allies are the centres affected, and their discharge produces directly the contraction of the vessels, dilation of the pupils, erection of the hair follicles (cutis anserina), and indirectly the lividity, the shivering and the feeling of cold that together constitute a rigor. Often, and especially in children, the discharge proceeds from a group of motor centres, and the effect is a convulsion. Sometimes the centres discharged are the highest of all, and the manifestations, direct and indirect, of this discharge constitute mania. I have notes of a case of typhoid fever which was for some days regarded as a case of insanity, the earliest observed occurrences being extremely vivid and persistent hallucinations, culminating in acute delirious mania.

(*To be Continued.*)

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