

A plea for the scientific study of insanity : being the substance of addresses delivered before the Royal Academy of Medicine of Ireland, and the Medical Institution of Liverpool / by J. Batty Tuke.

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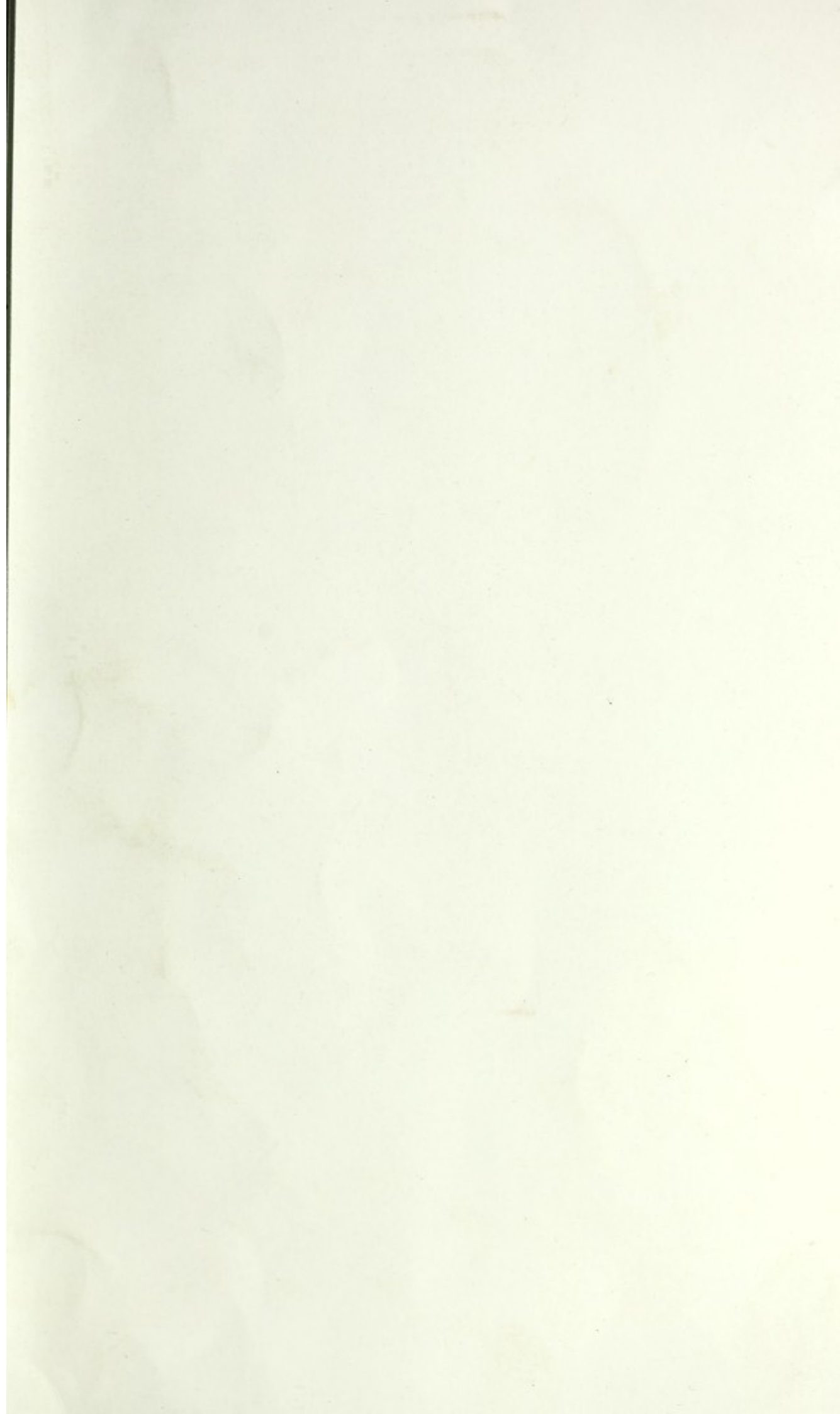
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A PLEA FOR THE SCIENTIFIC STUDY OF INSANITY.

BEING THE SUBSTANCE OF ADDRESSES DELIVERED
BEFORE THE ROYAL ACADEMY OF MEDICINE OF
IRELAND, AND THE MEDICAL INSTITUTION
OF LIVERPOOL

BY

J. BATTY TUKE, M.D., F.R.C.P.ED.,

MEDICAL SUPERINTENDENT OF THE SAUGHTON HALL INSTITUTION FOR THE CURE AND
CARE OF THE INSANE.

EDINBURGH AND LONDON :
YOUNG J. PENTLAND.

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A PLEA FOR THE SCIENTIFIC
STUDY OF INSTINCT

WITH THE ASSISTANCE OF AMERICAN COLLEGE
BIOLOGISTS THE EDITOR HAS BEEN
ABLE TO OBTAIN THE SERVICES OF
THE FOLLOWING AMERICAN BIOLOGISTS

YOUNG J. PENTLAND:
EDINBURGH, 11 TEVIOT PLACE;
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A BATTLE FOR THE MIND

EDINBURGH AND LONDON
YOUNG J. PENTLAND

PREFATORY NOTE.

At the request of numerous friends, I reprint the following
Address from the pages of *The British Medical Journal*.

JOHN BATTY TUKE.

SAUGHTON HALL, GORGIE,
EDINBURGH, *June* 1891.

PREPARED BY

As the result of a committee's report, the following

information has been prepared for the public.

JOHN BATTY, JR.

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A PLEA FOR THE SCIENTIFIC STUDY OF INSANITY.

I ASK you to consider a question of the highest importance, not only to the medical profession, but to the public at large; that question is, Does the study of insanity occupy that position in the realm of medicine which it ought to occupy? In my opinion it does not; it does not stand on the same level as other departments of medicine, and is regarded by the profession and the public as in a great measure disassociated from them. It has been often said that general and so-called psychiatric medicine stand divorced. With this statement I cannot agree, for the simple reason that I do not believe the two have ever been formally joined in the bonds of matrimony; and the object of this address is to show, first, the causes and consequences of separation; secondly, how union may be brought about, and the results which may be anticipated from it.

The main reason why this union has never occurred is that the study of insanity has not been conducted on the same principles as those on which general medicine has been founded. Anatomy, physiology, and pathology have been almost, if not entirely, ignored; and psychology has afforded, in association with clinical impressions, the institutes of so-called psychiatric medicine. Brief reference to the history of the subject will enable us to understand how this has come about.

The study of insanity in any form is barely a hundred years

old. The revulsion of public feeling against the system of cruelty and neglect under which the insane had suffered for centuries produced at the end of the last century a great change in their condition. The large proportion were relegated to asylums, where for the first time they came under the supervision of medical men. Almost inevitably the prominent symptom—mental aberration—forced itself on the minds of these observers, and their patients grouped themselves according as the prominent symptoms were exaltation, depression, or obfuscation of feeling. Nomenclature was based entirely on psychological considerations, and, although a large variety of such classifications were advanced, they all resolved themselves practically into the one enunciated two thousand years before by Hippocrates. The varieties of insanity were considered under the terms mania, melancholia, and dementia, which, to all intents and purposes, assumed in the mind of the profession and the public, the position of diseases. This position of matters necessarily served to concentrate attention unduly on the psychological aspect of the condition, and to keep in the background the study of the physical conditions, of which the mental aberrations were mere symptoms. The one exception to this rule was general paralysis of the insane, which was marked off as a distinct pathological entity, possessing a fairly consistent etiology, symptomatology, and pathology. So strong was this psychological influence, and so long did it continue unchecked, that we find in the Official Nomenclature of Diseases drawn up in 1871 by a Joint Committee of the Royal College of Physicians of London, all the insanities (general paralysis included) ranged under the head of Disorders of the Intellect, of which six were enumerated—mania, melancholia, dementia, paralysis of the insane, idiocy, imbecility. Surely nothing could show more thoroughly to what an exorbitant extent psychology had dominated the study, and had influenced the profession, than this formal renunciation of any connection between disease and insanity on the part of such an important medical body, which

emphasised its opinion by designating the insanities "disorders." Thanks to the works of Van der Kolk, Morel, and certain members of the Scottish school, this nosology was materially changed in the issue of 1881, when the same body advanced a fairly good, although somewhat confused, system of nomenclature, based partly on etiology, partly on psychology, and partly on clinical considerations.

The dominating influence of psychology shows itself strongly in the literature of the subject. Almost without exception, authors have commenced their works by disquisitions on mental philosophy. Many of these attempts to analyse mind, and to follow the course of its action in insanity, are of a very high order, and are doubtless of great value to the philosopher of abstract science; but the very highest of them brings us no nearer to the main conception, that the insanities are symptoms of various morbid conditions of the brain. It was not till the end of 1889 that a systematic book on insanity was published, beginning with a description of the organ through which mind is manifested, and through disease of which madness in every form arises. To Bevan Lewis belongs the high honour of first directing attention to the absolute necessity of study of the minute anatomy of the brain, and of showing throughout his colossal work how any conception of cerebral morbid processes is impossible without an intimate knowledge of nervous histology. In like manner, physiology and pathology have been neglected. The vast advances which experimental physiology has made within the last quarter of a century have had but slight perceptible influence on the general current of thought; and pathology, in the broad sense of the word, has been equally inactive. It is true we have been made fairly acquainted with the morbid changes found in the brains of the insane; and that (again thanks to Bevan Lewis) a chain of evidence is being constructed, showing the possible and probable connection between certain lesions and certain classes of symptoms. But utter vagueness exists as to the cerebral conditions in the early

stages of insanity—conditions which, I submit, must be attacked by the physician in order to obtain cure. It is to the study of these initial morbid states we must apply ourselves; they are the originators of symptoms; and, until we understand their nature, treatment cannot be applied, except empirically.

To all intents and purposes the department of medicine which undertakes the treatment of the insane is guided by psychology and clinical experience. We can always gain an insight into the position of a science by examining the papers set to candidates professing acquaintance with it, and seeking special recognition and honours following on the passing of examinations on the subject. The Medico-Psychological Association of Great Britain and Ireland has instituted examinations for a "Certificate of Efficiency in Psychological Medicine," which is granted on candidates passing certain examinations. The candidates are for the most part assistant medical officers of asylums. I have examined the questions set at various times for this examination, and have failed to find a single instance of one bearing on anatomy or physiology. It is true in the official notice of these examinations it is stated that candidates must be examined on the "Healthy and Morbid Histology of the Brain and Spinal Cord;" but, as I have said, healthy anatomy finds no place in the various published papers. The candidates are fairly tested in morbid histology, but the mass of the questions bear on psychology and clinical experience. Amongst the psychological questions we find: "Give an Account of the Will. How far do the Phenomena of Insanity illustrate it?" and amongst the pathological, "Explain the Pathology of Loss of Memory." Amongst the clinical questions we find a large number bearing on the candidate's views on certain clinical groups; but, so vague and conflicting is the literature of the subject that any one might undertake to answer the majority of these questions in two different ways—one diametrically opposed to the other—and quote authority for either statement. Take, for instance, general paralysis. The most contradictory opinions

are expressed in the various textbooks as to its etiology and pathology. One set of writers asserts—and I am sure rightly—that its symptoms are caused by a sub-inflammatory condition of the membranes and cortex; another, that they are the result of a “premature senility;” and, in like manner, the mere description of the symptoms of such a condition as puerperal insanity is of the most varied character. It may be urged that great disparity of opinion exists on many points in medicine, and that an absolute consensus of opinion exists in few. This is so; but surely no one will venture to say that the foundations of general and so-called psychiatric medicine are equally firm, or established on similar principles. No: the general conception of insanity is on the same level as that of the “dropsy” a century ago; and its varieties, mania, melancholia, and dementia are not one whit more pathologically definite than the anasarca, ascites, and hydrothorax of that period; and they must remain so till such time as the subject is studied by the same lights as those which enabled the anatomist and pathologist to break up the generic term dropsy into a series of widely different conditions possessing a common symptom.

As I have said, the official nosology and some textbooks recognise certain etiological or clinical groups of insanity, such as puerperal mania, senile dementia, and epileptic insanity; but, without exception, mania, melancholia, and dementia maintain their nosological position as distinct diseases, as concrete morbid conditions, and we seek in vain for any attempt to explain their causation on pathological principles. Whenever any one of these conditions is believed to have resulted from so-called “moral” causes, the reader is left to infer that a psychological continuity exists between cause and effect, without the intervention of any morbid cerebral factor. When a man becomes melancholic after a period of depressed emotion, the melancholia is suggested as an extension of the emotion; or, when another becomes maniacal after a period of excitement, the mania is suggested as its prolongation.

I would like to ask you to consider what grounds there are for regarding these three states of mind as concrete conditions, and for maintaining them in the position of diseases. Certain clinical observations serve to show that they have no right to any such position. In the first place, during the prodromal period of many cases of insanity, excitement and depression alternate; secondly, in many acute cases, mania and melancholia co-exist; that is, it is impossible to say whether they are cases of maniacal melancholia or of melancholic mania; thirdly, as many cases run their course the symptoms are consecutively mania, melancholia, and dementia; and, fourthly, in the condition called *folie circulaire* the same sequence of symptoms occurs time after time. A man may be melancholic in one week, maniacal the next, and demented the week after. In such cases, then, how is it possible to apply any one of these terms to indicate the actual nature of the disease under which a patient is labouring? Mania, melancholia, and dementia are merely convenient clinical terms to express the mental condition of a patient at a given time, and have no higher function. That there is no necessary psychological connection between the character of the emotional cause and that of the symptom is shown by the fact that in many cases depressing emotions are followed by maniacal symptoms, and that undue excitement may result in morbid depression. I trust that sufficient has been said to show that psychological considerations afford insufficient foundations for the scientific study of insanity, and should only play a subservient part in nomenclature.

How, then, must we regard insanity? It is not a disease. It is a symptom produced by many morbid conditions, which may arise primarily in the brain; or, secondarily, from depraved conditions of the general system. As we analyse cases as they present themselves, we find their insanity is traceable, in something like 90 per cent., to eight great classes of causes:—

1. Idiopathic morbid processes (that is, commencing primarily

in the encephale itself), produced by (*a*) over-excitation of the cortex; (*b*) the subacute inflammation of general paralysis; (*c*) acute inflammatory action.

2. Traumatic injury.

3. Adventitious products, tumours, apoplexies, etc.

4. Secondary effects of other neuroses; epilepsy, hypochondriasis, hysteria, etc.

5. Concurrent effects on the brain of diseases of the general system; syphilis, tuberculosis, etc.

6. Toxic agents.

7. Concurrent effects on the brain of evolutionary and involutional conditions; adolescence, pregnancy, the puerperal, the climacteric, and the senile periods.

8. Heredity.

Certain of these causes produce demonstrable changes of tissue; for example, the inflammations, the hyperæmia of over-excitation, traumatism and adventitious products, epilepsy, syphilis, toxic agents, and senile degenerations; others presumably produce changes in the various central constituents, the presumptions being founded on clinical and pathological analogies. It is not that the morbid action of these causes is undemonstrable, but that they are not yet demonstrated, mainly because the conditions produced do not often prove rapidly fatal. Heredity as a cause occupies the peculiar position of acting in two ways; first, as a predisposing cause, and so being a factor common to most forms of insanity; and secondly, as, in certain cases, acting as the sole factor, inducing symptoms without the intervention of any traceable active exciting agency.

Any classification based on etiology can only be held as provisional till such time as a nosology of the various conditions can be founded on the highest scientific platform—that of pathological anatomy. It is possible that as this line of inquiry is followed up certain classes of cases may be found to have been placed under one group which may require to be broken up; or, on the other hand, that subsequent investigation may show

that the same pathological conditions may underlie varieties which have been erected into species on grounds of origin or appearance which are not essential.* Such rearrangements may be, and indeed have been, made in every department of medicine. But I submit to you that the etiological method of investigation leads directly to special attention being given to the consideration of the changes produced in the convolutions brought about by the action of the various causes; that it has been successfully pursued as regards certain of them; and that, if followed up in connection with others, must result in important disclosures.

It would be impossible in the time at my disposal to attempt to refer to the effects in morbid action of the several causes adduced. I shall therefore confine myself to the consideration of one only, over-excitation of the brain, and endeavour to show how it may bring about structural changes, which in their turn produce mental symptoms. And I choose this class of causes for two reasons: first, because it will enable me to lay before you certain anatomical considerations which are applicable to the insanities at large; and secondly, because, so far as I know, no attempt has as yet been made to follow its results in morbid action.

Over-excitation of the brain is universally acknowledged as an inducer of insanity without the intervention of any other morbid factor; and the term "idiopathic" is strictly applicable to that form of irritation, the cause of which is undue exercise of the function of that organ, and the effects of which are expended on the encephale. Over-excitations, whether produced by such emotions as joy, sorrow, fright, anxiety, by worry, or by unduly prolonged intellectual action, are generally spoken of as "moral" causes, and in many works on insanity and in asylum reports are placed in strong contra-distinction to "physical"

* For example, puerperal insanity; insanity occurring during childbed may possibly be of toxic origin, or may be due to anæmia, or may be due to idiopathic causes.

causes, the psychical influence of the former being apparently held to be sufficient to account for the subsequent phenomena, irrespective of their action on the tissues of the brain. Very generally, as I have said, a psychical continuity is suggested, and no attempt has been made to connect the action of the cause with its effects in disease on the cortical constituents. But due consideration of the facts of anatomy and physiology ought to serve to demonstrate that no distinction exists between "moral" and "physical" causes; that, in effect, the former are as much physical as traumatism or alcoholic poisoning.

There is sufficient evidence to prove that when the psychical functions of the cortex are actively exercised hyperæmia of the active region is an immediate consequence. The observations of Mosso cannot be called in question, and I have had under observation two cases in which distinct hyperæmic bulging of the cortex through openings in the skull occurred during mental action. The bulging was steadily maintained whilst mental action continued; in degree it depended on the intensity of the action, and steadily increased according to the length of time it persisted until a certain maximum point was gained. With the withdrawal of stimulus the bulging gradually disappeared. The deduction to be drawn from this phenomenon is aptly put by Crichton Browne: "The blood vessels are clearly made for the brain, and not the brain for the blood vessels; and the amount of blood supplied to the brain and its several parts is determined, not by vascular domination, but by the functional activity of the nervous tissues."

The vessels directly involved are those which supply the cortex of the superior frontal and superior lateral aspects of the cerebrum, and are the terminal twigs of the three cerebral arteries, which are disposed in the cortex in an extremely rich plexus. When we look at this *rete mirabile* can it be doubted that it plays a leading part in the phenomena of cerebral action and that implication of its anatomical and physiological conditions must result in great and rapid perversion of function?

The vasomotor influences which govern this rich plexus are probably of two kinds, vaso-constrictor and vaso-dilator. The vasomotor centre is, under ordinary circumstances, in a state of moderate tonic excitement; but there is experimental evidence to show that alterations in blood pressure may be produced reflexly by stimulation of the cerebral cortex acting on the medullary centre.

Time will not serve to discuss now in full the question of vaso-dilator nerves. I therefore quote the conclusions of Gaskell: "The presence of special vaso-dilator nerves for the blood vessels of every part of the body is an accepted article of faith for almost all physiologists of the present day. Owing, however, to the fact that in most instances such nerves are found mixed up with the vasomotor nerves the evidence upon which their existence is based is, in the majority of instances, indirect rather than direct. Fortunately we possess among the vaso-inhibitory nerves a few examples, the separate existence of which is beyond dispute," namely, the inhibitory nerves of the heart, the vaso-dilators contained in the chorda tympani and small petrosal nerves, and the nervi erigentes. Considering the close analogy between the active functional congestion of the cortex and of the glands it may be fairly assumed that, as the chorda tympani, the glosso-pharyngeal and other nerves pass to their ultimate areas of distribution they send off vaso-dilator fibres to the membranes and convolutions.

Moreover, we must take into account the interesting experiments of Roy, on which he founds a theory that the products of metabolism have considerable effect on the capillaries of a region called into activity. His opinion is based on the absence of anatomical proof of the existence of cerebral vasomotor or vaso-dilator nerves and on the effects of injection of filtrates prepared from brains showing acid reaction. The injection of such filtrates is followed rapidly by hyperæmia. Roy concludes: "that the chemical products of cerebral metabolism contained in the lymph which bathes the walls of the arterioles of the

brain can cause variations of the calibre of the cerebral vessels; that in this reaction the brain possesses an intrinsic mechanism by which its vascular supply can be varied locally in correspondence with the local variations of functional activity."

In the present state of knowledge of the subject it is impossible to come to a definite conclusion as to the mechanism of functional cortical hyperæmia. I cannot now advance various arguments leading me to the belief that both sets of nerves may exercise influence; that stimulation of the vaso-dilator system is the immediate producer of functional hyperæmia; that subsequent inhibition of the vasomotor system of nerves assists to maintain it; and that the products of metabolism, especially under diseased conditions, also exercise a powerful influence.

Functional hyperæmia is in every respect a condition of health, one necessary for the provision of temporary nutriment during temporary activity, ceasing with the withdrawal of stimulus, when the calibre of the vessels is reduced to its original dimensions through the constricting nervous influence. Anatomical arrangements favour it. The rich plexus of vessels in the pia mater is always full—it might be said, over-full—in conditions of health; for the greater veins of this membrane enter the superior longitudinal sinus at an angle so as to direct the blood as it enters the sinus against the general backward current (Moxon), and thus maintaining a mild mechanical congestion. The increase of bulk of the convolutions due to functional hyperæmia is, under conditions of health, provided for by the displacement of cerebro-spinal fluid into the elaborate system of lymph spaces in the pia, the subdural space, and the dura mater, and into the cisterns at the base. All these spaces and cisterns are in direct communication with the ventricles and with the great spaces in the spinal column. The fluid reaches the extra-skeletal lymphatics by peri-vascular and perineural conduits, in fact, it escapes by every foramen of the skull and spinal column.

However much functional hyperæmia may be a condition of

health, demands on the local circulation may be so great, and may be so long-continued in consequence of the persistence of intellectual and especially of emotional activity, that, as in other organs, the physiological line may be passed, and pathological conditions may be induced, not confined to the vessels themselves, but extending to the tissues they supply. If the nutrition of the cells is unduly interfered with for any long-continued period of time a series of changes ensues, not only in the cells themselves, but also in the vasomotor and vaso-dilator control systems, which may be temporary or permanent according to circumstances. The circulatory apparatus is adjusted to meet the increased demand, but the cells being stimulated beyond the health limit, a condition of unstable equilibrium between nutrition and function is reached, and consequently, instead of normal discharge of energy, irregularity of discharge is produced by the prolonged maintenance of over-vascularity. The continuous excitation demands a greater supply of nutriment, and in consequence gradually increasing strain is laid on the vaso-control system, till at length one of two events occurs—either a diseased balance between nutrition and function is reached, or the balance is completely destroyed. In the first case, discharges take place at a lower level of cell nutrition and function; in the second, vascular changes become so advanced that what must be regarded as a series of sub-inflammatory processes ensues. To take a parallel example from the field of general pathology—the over-exercise of function of the special cells of the kidney, whether induced by excess of blood, by effete substances, or by the presence of poisonous agents, is the immediate cause of parenchymatous nephritis—and we have the first symptoms of the disease associated with cell changes, followed by vasomotor disturbances, which, in their turn, react on the cells and tissues of the organ through histological alteration of the vascular and lymphatic apparatus.

The implication of the relation of nutrition to function constitutes the preliminary or primary factor in the production of the

prodromal symptoms; the arteries of the cortex are dilated, and send an abnormal amount of blood inwards, and as a result there is increased and sustained pressure in the veins. If recognised, appropriate treatment may often procure reduction of hyperæmia, prevent degeneration of tissue, and procure recovery; but if the condition is neglected the sequence of events common to all tissues under similar circumstances of irritation ensues. A sub-inflammatory stage is reached, evidenced by much greater than normal deposits of leucocytes between the sheath and the muscular coat, and by various degrees of proliferation of the nuclei. Both leucocytes and nuclei break down, and a *débris* is formed, which, along with masses of blood pigment, occupies the spaces in large quantities, and can be found distributed along the whole course of a vessel to its ultimate ramifications. This *débris* has been found in quantities so large as to interfere with the patency of the lymphatic sheath, and to procure its distension by the obstruction of exudation fluid.

Implication of the lymphatic circulation is one of the most important—if not the most important—of the pathological factors in the production of idiopathic insanity. Allow me to remind you what the relations of the lymphatic system are to the cell itself. Each cerebral vessel, as it enters the cortex, is surrounded by a sheath given off by the inner layer of pia mater, which surrounds it to its ultimate ramifications, and is called the hyaline sheath. Each cell is surrounded by a capsule, which is an extension of the hyaline sheath, the two being connected by the spur-like process of Obersteiner. Thus each cell possesses a lymphatic envelope, which discharges the products of metabolism through the spur-like process into the hyaline sheath surrounding the vessel, which, in its turn, debouches into the hyaline or lymphatic sheath of the vessel, and the lymphatic fluid is thus conveyed into the spaces between the arachno pia and the visceral pia, and thence to the great cisterns already mentioned. Implication of this lymphatic apparatus may act in two ways—first, by submitting, through

diminished drainage, the cells to the action of waste products; and, secondly, by affecting the conductivity of vasomotor fibres. The spur-like process of Obersteiner is a very fine tubule, and necessarily easily occluded. Not only does the occurrence of exudates in the hyaline sheath dam back the flow from the capsule, but the deposits of leucocytes, proliferated epithelium cells, and masses of pigment, may actually occlude the openings of these processes. Under these circumstances, the cell lies bathed in a poisonous fluid, the reaction of which is acid, and so opposed to its healthy alkaline constitution. Degradation is a necessary consequence, shown first by granularity of the protoplasmic body of the cell, and subsequently by changes of a more profound nature. But exudation fluid may also effect the exercise of the function of the vaso-constrictor fibres. It is more than probable that a certain amount of pressure may be caused, and it is well known that pressure at first tends to stimulate, and, if continued, to paralyse the action of such nerves. In this case also the acid exudate acts in a similar manner, procuring intensification of function followed by exhaustion from extreme stimulation.

In whatever manner exudates act on the vaso-constrictors, it is certain to be finally in the direction of reduction of inhibitory function and consequent dilatation. When the pia mater becomes infiltrated, as it often does, there can be little doubt that pressure acts strongly on the branches of the system running between its layers. Whenever a vaso-constrictor nerve is involved in an inflammatory mass, we have the same condition as where it is accidentally cut; and this alone would be sufficient to account for the obstinate congestion of the brain, causing delirium or death, not only in cases of idiopathic insanity, but also in many other affections.

Mendel, Furstner and Kousnezoff have produced cerebral hyperæmia artificially, and have described the various changes occurring after its establishment; the chief of which are hypertrophy of connective tissue of the vessels and neuroglia, and degeneration of the cells and nerve fibres. I can only speak

from the experience derived from the examination of four cases of idiopathic insanity, which proved fatal within two months of the development of mania and melancholia, as to the period at which the products of sub-inflammatory processes show themselves and exercise influence. In two cases—one symptomatised by mania, the other by melancholia—deposits of leucocytes, pigment and nuclei of epithelium were found in considerable quantities, either in aggregated masses at the bifurcations, or scattered throughout the length of the vessels (between the hyaline sheath and the muscular coat) taken from the superior convolutions, and the proliferation of nuclei was marked. In two other cases—one symptomatised by mania (death having resulted from exhaustion), and the other by excited melancholia (the subject of which committed suicide)—stasis of a very well-marked character was found; the lumen of many cortical vessels of all sizes was occupied by blood corpuscles, the peri-vascular lymphatics were much distended and blocked by *débris*, and wide spaces between the sheath and the brain substance was shown in the maniacal case. There can be little doubt that these morbid products are deposited much earlier in the case than two months, but in the absence of data it is impossible to assign a definite period for their appearance. It is highly improbable that such intensity of diseased action occurs, save in extreme cases, but in the first two instances adduced the pathological products were not much more strongly marked than those presented in subjects of older standing insanity of a milder type. In such I have constantly found the products described, and have noted the evidence of extensive exudation. It is not often that the observer is fortunate enough to get the cellular capsule and its process in absolute relation to the lymphatic sheath; but in three instances I have procured evidence of their continuity, and noted the distension of the whole apparatus, the cell lying in a clear open space in connection with a wide canal. This can be easily demonstrated, as regards the capsule alone, in chronic cases. If, as Bevan Lewis asserts—and I entirely agree with him

—each cell is surrounded by a looped capillary, and if this vessel becomes implicated to the extent of stasis, or even short of it, it is not difficult to understand how degeneration of cell protoplasm is hastened by two sets of action; toxic from within, and deprivation of nutriment from without.

But further morbid instrumentality is at work. We have direct evidence that during sleep the cortex of the superior convolutions is anæmic; according to Mosso's experiments and observations the supply to the cortex is much diminished, the vessels—both arteries and veins—being contracted, and the brain is smaller. Insomnia is one of the earliest symptoms of incipient insanity, and continues during its acute period; sleep is not obtained in its natural degree till convalescence or terminative dementia is reached. It cannot be doubted that this insomnia is due to hyperæmia. In those rare cases of insanity in which there is no interference with the periodicity or intensity of sleep, the fact of its presence ought to influence diagnosis. Sleep is the condition necessary for the recuperation of cell tissue; in its absence the downward tendency to degeneration must necessarily be assisted.

The question which now naturally presents itself is, How can we reconcile the dependence of two such apparently widely divergent morbid mental symptoms as mania and melancholia on one common pathological condition? The arguments founded on clinical observation which I have already used to show that we have no right to regard these three states of mind as concrete conditions, or maintain them in the position of diseases, are again applicable: they alternate, they co-exist, or they occur in regular sequence in many given cases. But further, we may argue for the unity of pathological causal conditions by reference to the phenomena of general paralysis and acute alcoholism. In general paralysis of the insane, the inflammatory nature of which is beyond doubt, a certain proportion of cases are characterised by exaltation of feeling, another by depression, and a third by obfuscation from beginning to end, whilst in certain others

we may have all varieties and degrees of symptoms. The effect on the brain of the administration of certain poisons, markedly alcohol, is a sequence of psychical phenomena of much the same character; the drunkard runs the full gamut of symptoms in a couple of hours. These observations point, not to a difference in kind of primary causation, but to variation of symptoms in accordance with the progress and nature of pathological processes, which vary principally in accordance with the constitution of the tissues of the individual. It must be borne in mind that the deposits of inflammatory products and congestion are not identical or constant in the individuals of a series of subjects, because the individuals and their tissues are not constant quantities. We have thus a constant condition of irritation acting on inconstant subjects. We know that the pathological results of over-taxation of brain function are accompanied by morbid excitement of action of the organ; but we are apt to forget that, although mania is accompanied by exaltation and melancholia by depression of feeling, they are both manifestations of excitement of feeling. Given this common psychological condition of excitement of feeling, we must seek for an explanation of the varieties of its phenomena either in some quality or quantity of its exciting cause, in some peculiarity of its pathological products, or in some idiosyncrasy of the affected individual. We derive no material assistance from psychological considerations, for there is no necessary connection between depressing emotions and melancholia on the one hand, or between stimulating emotions and mania on the other. Intense grief produces mania as often as melancholia, and the insanity of the man of saturnine disposition is as often as not characterised by mania. The peculiarity of the exciting cause appears to be not its psychological characteristics, but its intensity and rapidity of incidence, the latter depending not only on the former but also on the stability or instability of tissue. According as excitement of feeling is rapidly produced, so the more likely is mania to be the symptom, especially when it acts on an

extremely irritable but unstable protoplasm. It is not only to the hereditary constitution of the cortical cells and their networks to which we may look for evidence of instability and irritability, but also to the ganglia which govern the vasomotor systems of nerves. Inherent weakness of these centres may play an even more important rôle in the production of insanity than instability of the peripheral ganglia, more especially as regards the rapidity of its production. May not hereditary instability exist as frequently in the cells of the vasomotor or vaso-dilator as in those of the cortex? That melancholia often supervenes on depressing emotions, gradual in their incidence and action, does not imply a psychological nexus, but that as their irritating influence is slowly applied to cells of low vitality and nutritive power, so the results of the irritation are slowly produced; and, as in the case of every organ of the body, we have variety of degrees of symptoms in conformity with the rapidity of the progress of pathological events. In extreme cases of recent excitement, maniacal or melancholic, I have found stasis and the products of inflammation; in chronic cases the same appearances are presented, although in a less degree, whatever the symptom may have been; and, if we have any right to connect *post-mortem* demonstration with the indications of disease during life, the inference is unavoidable that considerable variety of clinical phenomena may be dependent on a common cause acting on differently constituted tissues.*

It is unnecessary here to enter on a description of the further gradual degradation of brain elements, all of which suffer in the event of hyperæmia not being overcome. Suffice it to say that the result is disorganisation, more or less complete, which, so far as the mental functions are concerned, means terminative dementia.

But, beyond impairment of the psychical functions of the

* This argument will be found more fully discussed in the article "Pathology," by Dr Sims Woodhead and myself, in the forthcoming *Dictionary of Psychological Medicine*, by Dr D. Hack Tuke.

brain, another important function is apt to become impaired as a consequence of morbid hyperæmia. The general system of the patient suffers at an early period from implication of the "trophic," or, to speak more accurately, the nutrition-governing, function of the brain. That organ being diseased, the power it possesses over metabolism becomes lessened, which is soon manifested by impaired nutrition. The patient rapidly becomes pale and dusky in complexion, the skin does not act normally, the hair becomes dry and harsh, the chylopoietic viscera perform their functions inadequately, the muscular tone—in fact, the tone of the whole system—becomes markedly lowered; and in women menstruation becomes irregular or is absent. To this implication of other systems, consequent on the impairment of the control of the function of the cerebrum, can be traced a large amount of the errors which exist as to the causation of idiopathic and other insanities. The secondary condition is very frequently set down as the primary cause. The insanity may be referred to derangements of the stomach, when they are in fact, concomitantly with the mental disturbance, results of the cerebral mischief. In like manner, arrested menstruation is often insisted on as the proximate morbid influence.

I am compelled to confine myself on the present occasion to the demonstration of the results in pathological action of purely idiopathic causes, merely assuring you that evidence of the results in morbid action of many other classes of causes is not difficult of production. My belief is that the time is not far off when we will be able to base a classification of the insanities on the highest platform of pathology—morbid anatomy. Taking our stand in the mean time on etiology, we start from the point which is most likely to lead us to the consummation of our hopes, which could never be arrived at from a study of psychological symptoms. From a social and legal point of view they form the essence of a given case, but that they ought to assume the same position to the physician is to my mind very highly questionable. To take, again, the prominent example—general

paralysis of the insane—in the majority of its subjects the predominant symptom is exaltation of feeling, but, in a smaller proportion, melancholia and dementia are the characteristics of the disease. The pathological condition is the same in all; therefore the mental symptoms are of secondary importance. Analogies might be adduced in other forms.

In my desire to concentrate attention on the thesis that insanity is a symptom of active idiopathic morbid cerebral processes, I have been obliged merely to allude to other prominent examples, markedly general paralysis, the traumatic, syphilitic, toxic, and puerperal insanities. All these are the result of disease produced directly by the action of morbid factors. We are told by certain authors that insanity at large may be accounted for on the theory of "dissolution" beginning in the convolutions. I honestly confess I cannot grasp the idea or reconcile it with the results of pathological and clinical observation. That certain forms of insanity are connected with involutional changes in the individual is undoubtedly true, but to say that the forms I have just alluded to bear any such relation is to me as difficult to understand as would be the assertion that pneumonia, tuberculosis, or inflammatory nephritis, were evidences of involution. The propagation of such an idea widens the breach between the insanities and disease at large, and serves to divert the attention from the search after methods of overcoming those actual morbid processes, of which insanity is only one of the symptoms.

If we accept this position the subjects of most of the insanities are very sick people indeed; that they are so I have no doubt, for they may, in the first place, be in danger of their lives, and, in the second, they are in imminent danger of lapsing into that living death, terminative dementia. In order to prevent permanent implication of the cortical substance each case demands special hospital treatment conducted on identically the same principles as those which regulate practice in our general infirmaries, and conducted under similar conditions as regards

rest, nursing, and therapeutic agents. This is, or should be, easily attainable for patients of the upper and middle class; but for those derived from the poorer class the existing system of asylum structure, management, and treatment, makes it almost unattainable. I am not going to repeat the opinion expressed on many previous occasions that the structure of our lunatic asylums is very faulty, that individual treatment of the patients is impossible so long as the energies of the medical officers are expended and frittered away on administrative duties, and that treatment is not directly applied to the relief of the morbid brain conditions, and consists in too great a degree in attempts to attack the mental symptoms by psychological agencies. My contention is that the large majority of recent cases, rich and poor, require strict hospital treatment under circumstances of curative rest and calm. No class of cases requires the attention of trained nurses more than the subjects of recent insanity; the head nurse of each ward or department should have been trained in a hospital for at least a year. We all know the value of the trained nurse in ordinary disease; I can assure you my experience is that the constant observation of such officers is specially valuable amongst the insane, many of whom can give no indication of symptoms of disease of the general system, and where clinical phenomena often require to be interpreted much in the same manner as those of sick children. I hold that rest and quietude are absolutely demanded. Exercise must be employed with the utmost care. In the early stages of many forms of insanity it is absolutely baneful, and often aggravates symptoms. Most idiopathic cases, for instance, are for the first few weeks best treated in bed or on the sofa, careful massage taking the place of exercise. By this method functional hyperæmia of the muscles is easily induced without any expenditure of energy. Where there is anything approaching to emaciation, or even flabbiness of muscle, considerable quantities of oil may be used by the rubber, and the patient often gains weight by sleeping in oily blankets. This is far

superior to the system of overloading the stomach with large quantities of oily food, which the atonic digestive apparatus is not able to deal with, and which is liable to increase gastric affections. Simple well-considered diet in moderate quantities is ample to procure good results. It may be suggested that the restlessness and excitement (whether maniacal or melancholic) of certain patients renders such treatment difficult or impossible. Difficult it may be, but not impossible, in the presence of a well trained hospital staff; and as such treatment is persevered in difficulties disappear. Rest and quietude I hold to be essential in such cases. The congregation of patients is most objectionable. The seclusion of cases of hysteria and sufferers from nervous exhaustion has been strongly advocated, and I am sure rightly; how much more is it called for in the cure of the hyperæmic brain, the subject of which is liable to irregularity of cortical discharge? Restriction to the bedroom under charge of competent nurses affords the best opportunity of obtaining quiet and of avoiding objects of irritation. This is impossible in the ordinary asylum ward except for a restricted number of cases; but in a properly constructed hospital, where the rooms should be large and numerous, it would be readily attainable.

For many years past I have doubted whether the constant excitement of balls, parties, theatricals, and other amusements is good for the insane. It appeals to the popular conception of psychological treatment for a psychological complaint, but I have no hesitation in saying that for the mass of the insane it is not good. It may be of a certain value for certain chronic cases, as it would be valuable in an ordinary workhouse, but as a curative agent it may be discarded. Why should an excited crowd live in an atmosphere of excitement? I have known many cases of terminative chronic mania and melancholia, and of *folie circulaire*, recover after a course of steady treatment conducted under circumstances of complete rest and quietude. It may be said that recent cases are not generally sent to entertainments; but they live in the atmosphere of excitement caused

by them. The knowledge that a weekly ball occurs, the preparations for it, the bustle attending it over the whole establishment, the restriction from being present, all tend to maintain the restlessness of the acute case. In separate hospital blocks this would be avoided. I am far from saying that amusements carefully administered are not good for the chronic insane; in certain convalescent cases even they may prove beneficial; but all those in whom active disease is present are better withheld from its unsettling influence.

Therapeutic treatment is too large a question to enter on upon the present occasion. To be of any avail it must be preceded by most careful and systematic clinical examination, aided by every diagnostic instrument and process at our command. Treatment founded on the character of the mental symptoms may be entirely erroneous. Take the case of "acute mania," which is equally dependent on sthenic and asthenic conditions. We may have it in a florid person labouring under idiopathic insanity, and in the anæmic subject of the insanity of lactation; manifestly the same remedial measures are not applicable to the two cases. These are extreme instances, but many occur in which the determination of such matters as the condition of the blood, the proportion of urinary excreting products, and the reaction to electrical stimuli, afford important indications as to treatment. Cases of almost any class when subjected to treatment during the prodromal periods are readily amenable to therapeutic agents; and even when further advanced rapid recovery is often obtained by their employment. But it must be remembered that the brain is liable to suffer under pathological conditions from a circumstance which does not affect many other organs: it can obtain no vicarious aid, it cannot cast its functions on other systems, it must do its own work, and rid itself of the products of waste and disease. Long continued treatment is therefore often necessary; but steady continuous hospital treatment obtains cure in many cases which at first appeared hopeless; half-hearted efforts continued for a few

weeks or months are therefore not sufficient; the physician must work at his case as a physician till the last glimmer of hope is lost.

In Scotland, I am glad to say, great efforts are being made to obtain true hospital treatment. In connection with certain Royal and District asylums, hospital blocks, separate and apart from the main buildings, are being constructed where patients will be submitted to curative influences apart from the excitement of asylum life. They will, in these hospitals, be treated, it is to be hoped, as sick people suffering from disease of the brain. But there is another great desideratum. The treatment of the insanities must be brought more directly under the observation of the general practitioner and the student of medicine. At present all so called "mental cases" are prohibited from entering general hospitals, and the graduate or licentiate may enter on the exercise of his profession, without ever having seen a case of insanity. This is one of the great causes of the breach between the insanities and general medicine. The advisability of establishing in London a hospital for the treatment of recent and acute cases has been under discussion. The scheme is at present in abeyance, chiefly owing to the opposition raised against it by asylum superintendents, in whose arguments, or rather statements, I have failed to find anything substantial. The experiment was well worthy of trial; no one could have suffered from it, the insane might have benefited by it, and the study of the insanities might have been largely developed by their subjects being brought under the observation of physicians whose experience of disease extended over all its phases. The subject was discussed at various meetings of the Medico-Psychological and British Medical Associations. Few could help feeling deep disappointment at the almost unanimous expression of perfect satisfaction with the existing state of matters regarding the treatment of insanity. No faults, no shortcomings were admitted; administration was held to be perfect, and a higher

scientific position to be unattainable. So long as the insane were well housed, well treated, well aired, and well amused, the asylum physician exhausted the chief resources of his art. Hospital treatment, as opposed to asylum treatment, was scouted and scientific investigations were, by certain speakers, jeered at. How far such opinions are in consonance with those of the general public may be questioned; but it is certain they are not in accord with the feeling of an important and rapidly increasing section of the medical profession.

I have said elsewhere, and I say it again, that an asylum is not the best place to teach the future general practitioner how to observe and treat the insanities. He finds there cases more or less confirmed, and initial symptoms, which are really the most important for him to be conversant with, are never brought under his notice. In connection with all our great hospitals small wards should be established where recent and acute cases could be submitted to treatment. Such wards would not be nearly so difficult of management as the delirium tremens wards which at present exist; they would save hundreds yearly from being sent to asylums by procuring their early recovery; they would allow the student to become accustomed to the observation of a type of disease which afflicts three in every thousand of the community; they would afford the practitioner the knowledge of a condition which he does not at present possess, but which the law presupposes he is in possession of, inasmuch as it confers on him considerable powers over the liberty of the subject; and they would serve gradually to draw the study of the various diseased conditions of which insanity is a symptom within the confines of general medicine. The professional and popular conception of their position would undergo great modification, and as time goes on such terms as mental disease, psychiatry, psychological medicine, would fall into desuetude, and along with them the prejudice, superstition, and misconception which they help to maintain would cease to exist.



