possible way the fruits of that combined work on which I believe the future of medicine so much depends. It is to such combined work, and to such mutual interest, that our meetings of this week call us, and we cannot doubt the result. But we meet not only for work but for pleasure, for the pleasure of renewing old friendships, and for the pleasure of making new ones; for the pleasure of imparting knowledge, and for the pleasure of receiving it; for that instinctive pleasure which arises from the first meeting of men whose work we know and whose labours we have long appreciated, but whose personal influence we have never before felt. These advantages flow from all meetings of scientific men, whose feelings and whose interests have so much in common, yet whose life and whose labours lie so wide apart; but I believe that by no class of men is there felt more real community of interest, or more true sympathy in each other's work, than that which is evidenced at such meetings as this, of members of the profession of medicine.

ADDRESS IN MEDICINE

BY

JAMES CUMING, M.A., M.D., F.K.Q.C.P.I.,

Professor of Theory and Practice of Medicine, Queen's College,
Belfast.

*At the Annual Meeting of the British Medical Association held
at Nottingham, July, 1892.*

The Extent to which the Study of Ancillary Sciences is necessary for Medical Students.—The Recent Advances of Bacteriology and Neurology.—Phagocytosis and the New Cellular Pathology.—Hypnotism.—The Alleged Increase of Nervous Disease.—Increase of Insanity.—Psychology and Medical Psychology.—Neuropathology.—The Pathology of Memory.—Aphasia.—Experimental Psychology.—The Necessity for the Adaptation of Medical Studies to the Changed Conditions of Modern Life and Competition.

GENTLEMEN,—When I accepted, with some diffidence, the high honour of addressing the members of the British Medical Association at this meeting, I decided after some reflection to devote the time at my disposal to laying before you some considerations regarding a subject which has naturally much interested me, as now for many years a teacher of medicine in a large and flourishing college, namely, the position of medical science in the general world of thought and its relations to certain other branches of knowledge with which it is allied.

It has often been a subject of regret to those familiar with the history of medicine and solicitous for its repute and dignity, that the profession to which we belong should have lost the primacy of learning to which it was once legitimately entitled. The often-quoted remark of Bacon attributing greater honour to divinity and more profit to law, but awarding the palm of learning to physicians was no doubt an accurate estimate of their relative position at the time of Harvey.

Now, while we have lost in respect of learning, I fear it can hardly be said with truth that we have gained much upon our sister professions in respect of honour or of profit. Yet, at no period of the world's history has medicine been more assiduously cultivated, never have its ranks been filled by so many able and energetic workers, and at no period have its claims to public usefulness been capable of being so triumphantly vindicated. And the question naturally arises in what method can its dignity and usefulness be best furthered and developed, and whether there are any impediments which tend to embarrass its progress and trammel its efforts, of which it might be advantageously relieved, and whether its study is being conducted on the lines best calculated to lead to the results at which we aim?

Let us consider for a moment our relations to certain of the natural and experimental sciences, namely, chemistry, botany, and physics. Chemistry and medicine have been long closely allied. Cullen lectured on chemistry both in Glasgow and subsequently in the University of Edinburgh.

Boerhaave was hardly less celebrated as a teacher of chemistry than as a teacher of medicine, and for a lengthened period chemistry was regarded as likely to furnish the key to the alterations generated by disease, and to be of prime helplessness in dealing with its manifestations; and thus, not unnaturally, the physician and surgeon has found a knowledge of chemistry laid down as an essential portion of his preliminary training.

Now, during the last twenty years the growth of chemistry has been prodigious. It is no longer a science which one man can master, or of which he can even have a comprehensive grasp, as a perfect cataract of new facts is pouring down without cessation. The annual reports of the German Chemical Society for the year 1871 were contained in the modest number of 998 pages. For 1891 they have risen to 4,270 pages of original communications, and 1,006 pages of abstracts, making a formidable total of 5,276 pages for a single year. Even a professor who devotes his life to this subject finds himself unable to cope with the immense mass of details which is accumulating, and, feeling it hopeless to attempt a thorough mastery of the subject, usually confines himself to one or two portions of the science. There are, of course, many fundamental doctrines and facts in chemistry which no further research can alter, but some aspects of the science are changing from day to day.

May not the question be fairly put whether it is necessary or desirable that the student should make a serious attempt to grapple with this immense mass of material? Would not the principles of chemical science suffice amply for his practical wants, which after all are comparatively simple? When the practitioner of medicine has tested for albumen and sugar, and is familiar with the composition and reaction of a few urinary deposits, and knows that a condition of acidity may be temporarily relieved by an alkali, he has pretty completely gained all the information of practical value which chemistry is likely to give him for the needs of his daily work. We may, perhaps, add the tests for the principal poisons and alkaloids. To carry on investigations into the problems of pathological or of physiological chemistry elaborate and complicated apparatus are necessary and also ample leisure, so as to afford opportunity for the close and uninterrupted attention which is essential to their successful prosecution. Subjects of such complexity can only be dealt with adequately by those engaged in scientific pursuits. They constitute the field for men of research as distinguished from men whose best energies must be given to the active work of professional life.

In so far as the physician devotes himself to this class of pursuit, in so far does he divorce himself from the occupations of his daily life, and this line of research, though it may touch, does not coincide with that which his professional duties compel him to follow.

Trousseau—perhaps the most accomplished clinical observer of the past generation—used to recommend students to learn chemistry thoroughly, that they might once and for all become convinced that it was of no use in medicine. Nor can we derive much comfort from the prospect held out to us by some chemists that the free carbonic acid necessary for the nutrition of vegetables, and the free oxygen necessary for the maintenance of organic life are steadily diminishing, and that the time is slowly, but surely, approaching when the conditions necessary for our existence will no longer prevail, and when all life will become extinct on this planet.¹

Then as regards botany, does the botanical source of our remedies in any way elucidate or guide us in their application, or would the majority of us recognise the plant in its growing or dried form from which we derive our most valued agents? The tendency—a tendency daily increasing—to employ the compact and manageable preparations furnished by the large manufacturing druggists is waging a serious and not unsuccessful war with the art and mystery of the apothecary, and has already much diminished, and tends daily still more to diminish the preparation by the practitioner of even the ordinary pharmacopœial remedies.

As for natural philosophy, so important did this, at one time, seem to the examining board to which is affiliated the School of Medicine with which I am connected, that nothing less than three examinations in successive years could satisfy

¹ Bunge, *Phys. and Path. Chemistry*, trans. by Wooldridge. p. 19, 1890.

that body that medical students had adequately mastered the mysteries of light and sound, of mechanics, hydrostatics, and electricity. Proficiency in such secondary subjects as medicine and surgery could be tested in one examination, but no less than three were necessary to afford sufficient proof that the future physician understood these branches of physics sufficiently. If the human body were a congeries of tubes, or a bundle of levers, or a galvanic battery, more scrupulous pains could not have been taken to ensure attention to these branches of knowledge. And yet I think everyone will admit that any considerable, not to say profound, knowledge of subjects which have received so much attention at the hands of physicists, and which have been worked out with such minuteness and care, and of which the full comprehension entails so much mathematical acquirement, are altogether beyond what may be fairly required from a student of medicine.

It may be urged that the study of the ancillary sciences, as they have sometimes been called, is of high importance to the discipline of the intellect, and tends to develop the habit and the power of careful and accurate observation; and this may be admitted in the fullest and most ungrudging manner. But the powers of the average human intellect are far from illimitable, the capacity of attention is bounded, and the sum of mental energy requires to be carefully husbanded, to be directed in the right channels and not to be allowed or compelled to dissipate itself in useless effort. Besides it cannot be justly denied that there are several subjects which are more closely identified with medical science, which subserve more directly and efficiently its activities, and which afford abundant scope for wide and exact mental discipline. To overload the memory with a mass of facts which never become fairly organised into its structure, and which, never being revived, fade gradually but surely into oblivion is a wasteful and exhausting process. It was at one time necessary to defend medicine from the overweening pretensions of authority and prescription; may it not be now necessary to shield it from the excessive demands of science? A student with the mental equipment which I have indicated, finds it—

Like Saul's great armour on the shepherd boy,
Encumbering, and not arming him.

We may now leave the negative part of our subject and turn to what constitutes the indispensable parts of our equipment. Besides the so-called practical subjects—medicine, surgery, and obstetrics—we should know all that can be learned about the structure and the functions of the human body. Our anatomy must be thorough, although it is instructive to remember even in respect of a subject so absolutely essential as a groundwork of medicine and surgery, that a surgeon of no less eminence than Mr. Lawson Tait entered his protest in Birmingham against the unnecessary minuteness and elaboration of even anatomical teaching. For my own part I am inclined rather to adopt the standard of Huxley, that anatomy should be so learned that the body will be, as it were, transparent to the eye. Then we can afford to dispense with no considerable portion of the wide and fruitful field of physiology, a science which is now so extended and so rapidly increasing that many men of science are specialising themselves on different portions of its vast territory.

Now one cannot fail to be struck with the fact that among the subjects of greatest present interest there are two which seem to give evidence of distinct currents of thought moving apparently in opposite directions. On the one hand we find an important part in pathological and physiological processes ascribed to minute organisms, the white corpuscles or leucocytes, which are apparently free from all direct nervous influence and float freely in the blood; and on the other hand we find that the domain of the most highly organised and differentiated part of the body, the nervous system, is being extended and increased. It seems as if attention was being divided not unequally between the simplest elements of the body and the most complex portion of its structure; shared between little masses of protoplasm which present but slight differentiation in structure, and the nervous system with all its complicated and refined activities and powers. And even what is still more remarkable, we find a certain similarity in function suggested as existing between these seemingly widely different portions of the economy.

It has been long known that unicellular organisms, amoeboid

cells, possess the power of choosing their appropriate nutriment and of rejecting what is harmful or useless to them. These facts have been for a considerable time familiar to naturalists, and their remarkable character has caused them to be studied with much interest. It has been abundantly shown, in respect of animals higher in the scale, but possessing either no cerebral hemispheres or only a rudiment of them, that they are capable of much and varied bodily activity in response to suitable stimuli. With regard to the human body, it has been also established that osmosis does not take so important a part in nutrition as was formerly supposed, and that a distinct selective power is exercised by the epithelial cells of the intestines, which, for example, pick out the globules of fat from the materials within their reach, and transmit them to the commencement of the chyle vessels. Now, the striking observations of Metschnikoff regarding the action of the leucocytes on microbes—the phenomena of phagocytosis—have naturally been received with more favour, owing to the knowledge we possessed of facts presenting some analogy with his observations.

The instructive discussion which took place in the Pathological Society of London during the earlier months of the present year has brought, more prominently than formerly, the facts on this subject before the profession in this country. In the main, I think, we are compelled to accept Metschnikoff's views as representing the present state of our knowledge, and accordingly we must accept phagocytosis, notwithstanding the opposition of some observers of great weight and authority, and notwithstanding some considerable objections. It seems, then, to be established that certain cells, of which the leucocytes are the most important, possess the power of attacking and destroying certain infective microbes when introduced into the body; that these free, mobile, and apparently quite independent organisms act in a manner highly important to the integrity and safety of the body at large, protecting it under suitable circumstances from the injurious effects of virulent bacteria. So much, I think, may be regarded as fairly established, even should Buchner's views regarding the importance of antibiotic fluids in the blood be ultimately established.

It is, however, with a certain degree of wonder, not unmingled with distrust, that we find something of the purposive character which has hitherto been supposed to be the exclusive endowment of conscious beings attributed to these minute, hardly differentiated masses of protoplasm. We learn that under the influence of chloral the leucocytes refuse their work and become anaesthetised, so that the bacteria have it all their own way. We are told that they show a liking for some substances, and an instinctive aversion for others; and some facts are adduced regarding their mode of warfare, which seem to point to a more than nascent civilisation. One observer describes them as marching right up to the bacilli and attacking them, which seems analogous to the Napoleonic tactics in battle, while the lymphocytes are described as forming a second line of defence, a method suggestive of the more watchful strategy of Moltke. Altogether the demeanour and endowments of the cells open up a field for investigation, both as regards cell action in itself and as regards its relation to the organism generally, which contains much that is of the highest pathological and physiological interest. A new cellular pathology is being developed, differing widely indeed from the brilliant theory bearing this name, so long familiar to us from the powerful advocacy of Virchow, but agreeing with it in the important functions assigned to the ultimate elements of the body as independent factors, both in morbid and healthy processes; and also in representing them as being either uninfluenced or as only indirectly influenced by the nervous and vascular systems in some of their essential activities.

Now while phagocytosis is directing our attention with increasing interest to the minutest and most elementary constituents of the organism, on the other hand, renewed zeal is being shown in investigating the complex problems which the nervous system presents to the inquirer. Even with regard to those more doubtful subjects which are in the borderland of legitimate scientific inquiry, a revival of interest has taken place. Hypnotism and its allied states have long exercised a powerful fascination on a large portion of the intelligent public, and have been looked on with much

curiosity, but always with a little suspicion, by physicians. Although not new, these singular and striking manifestations have of late been more carefully studied, and the methods of producing them have been more clearly ascertained, and one is glad to notice that, instead of being relegated to non-professional men, they have engaged the attention of some of the physicians most competent to conduct such inquiries, and most capable of estimating their results with precision and judgment. Whatever verdict may ultimately be passed on hypnotism, there can be no reasonable doubt that certain facts have been elicited which show that, in the hypnotic condition, profound and extensive modifications occur in the sensory and motor functions of the brain. Now, admitting much that has been urged against hypnotism; granting that it is likely to attract the attention of men who have a liking for the marvellous; that it can be practised by men possessed of no scientific training, and incompetent to deal with the most refined activities of the nervous system, and that it thus lends itself to charlatanism and imposture; granting that it may be attended with danger of a formidable kind, and also that its field of therapeutic usefulness is likely to be at best a very restricted one, and its effects probably only transitory; still it is a subject eminently deserving of careful and profound scientific investigation, conducted under the most rigid precautions, so as to exclude intentional or involuntary deception. We do not need to be much concerned about whether, as has been stated, we have in hypnotism a condition akin to natural sleep, or whether it is in reality a pathological state related to hysteria. What is at present wanted is a clear account of the phenomena which are capable of being produced under its influence. If, as numerous statements aver, hypnotic suggestion can be shown in any degree to affect processes of nutrition and the reaction to irritants, then some points of the very highest interest as regards the influence of psychical on physical processes will have been established.

Most of us have been inclined to read with a considerable degree of scepticism the accounts of instances in which obvious physical changes have been stated to have resulted from nervous influence, especially when these changes have occurred in a rapid manner. But should the statements on this subject which have been made so positively, and on the faith of apparently cautious and trustworthy observers, prove to be authentic, it will certainly compel us to reconsider our position with reference to this subject.

The opinion is very generally entertained that the diseases of the nervous system are now more widely diffused and more numerous than formerly. It is somewhat difficult to obtain accurate statistics on this question, and not altogether easy to ascertain their precise value, but some facts seem open to no serious question. In Ireland, the proportion of the insane to the population has steadily increased. I owe to the kindness of the Registrar-General for Ireland the numbers of those mentally affected as shown in the census of 1891 as compared with that of 1881. The numbers of the insane, including idiots, were: in 1881, 18,313; in 1891 they are 21,188, an increase of 2,875, although the population has diminished by 453,677. The proportion is 224 to each 100,000 of the population. Even allowing for the fact that emigration takes away in the main the healthy and strong, and that consequently this represents the proportion of insane to a much larger population than now exists in the country, still it indicates a very notable increase.

The reports of the Registrar-General for England show an almost uninterrupted increase in the mortality from nervous diseases. Some of this is no doubt explicable in other ways, but, on the whole, the evidence of statistics coincides with the general opinion among physicians that there is an increase. Whether this depends on the increase of causes tending to overwork, and weary, and exhaust the brain and nervous system we need not at present stop to discuss. Now, even those of us who have no special connection with the treatment of the insane find ourselves frequently brought into contact with questions regarding insanity. Apart from the mere granting of certificates, which, however, is attended with much anxiety and with heavy legal responsibility, there are the numerous minor forms of aberration in which it hardly becomes a practical question whether they necessitate restraint or not, and there are also the many instances in which general affections produce mental phenomena. Then

we have the numerous cases of temporary insanity which are never known beyond the families of the sufferers and the medical men to whom their care is entrusted, as well as the incipient stages of mental disease in which skilful management is of the utmost importance.

It is no doubt in consequence of considerations based on these facts that systematic instruction on the subject of mental disease has been adopted by some of the examining bodies as a necessary part of the training of the practitioner in medicine, and has thus become a recognised portion of medical education. I may add that the existence of the Psychological Section of this Association is a further proof of the importance of this branch of inquiry to the medical practitioner.

Now, the study of medical psychology alone is, in my mind, a very incomplete and inadequate preparation for comprehending the multiform disturbances of mental function, and is even more inadequate in respect of either diagnosis or therapeutics, and in view of the expectation of adding to our knowledge of cerebral diseases, as regards either localisation or character.

I have long been of opinion that some knowledge of psychology proper, that is of the science of the phenomena of mind in its normal conditions, is absolutely necessary. Without an acquaintance with the problems and methods of psychological inquiry it is impossible to observe and to describe adequately the phenomena of morbid mental states. In the investigation also of those conditions in which the disturbance of a single function is what is most manifest and striking, it is clear that a knowledge of the limits and differentiation of function must be of capital importance. It will be of value also to become familiar with the terms used in psychology, in itself a study of no inconsiderable difficulty and extent. In dealing with such questions as amnesia, aphasia, delusions, and hallucinations, and other disturbances of consciousness we are not only in the sphere of our legitimate activity and of our daily work, but we are touching, not indirectly, on some of the most interesting problems of mind. In examining these questions we get into one of the main currents of modern thought, and have suggested to us some problems which have engaged the attention of many of the acutest intellects of ancient and modern times. Some psychologists refuse to accept any help from physiology and fortify themselves in the citadel of introspection, declining all external aid. It is said by them that the comprehension of physical processes throws no light on psychical processes, and that these are absolutely heterogeneous. I am not concerned to defend the claims of physiology, which find advocates enough; but in respect of morbid conditions, when we find misery and despondency connected with defective digestion, perversions of the will and deceit attending on hysteria, emotional instability, causeless anger, and childish tears and laughter accompanying the later stages of chronic damage to the brain; when, to take simpler and more transitory influences, we find alcohol leading to the well known mental exhilaration which attends the early stages of its effect; when we find opium, in those accustomed to its use, producing such agreeable sensations that De Quincey could state that: "Here was the secret of happiness, about which philosophers had disputed for so many ages, at once discovered; happiness might now be bought for a penny and carried in the waistcoat pocket; portable ecstasies might be had corked up in a pint bottle, and peace of mind could be sent down by the mail:" when we find all these and many kindred mental accompaniments of physical changes brought to our knowledge, we have the strongest motive to attempt the analysis of the material lesion and of its modifications and varieties. Some of our greatest observers attach much moment to the entire and absolute denial of any relation of cause and effect in these events, and they insist on regarding the neural occurrence as merely concomitant with the mental occurrence. Now we may grant at once that the nexus between them is as yet undiscovered and may be undiscoverable; but in investigating mental phenomena from the physical side we are doing something that can hardly fail to throw light on certain obscure questions, and we need not embarrass ourselves with any considerations regarding the real connection or relation with each other of these concomitances.

For my own part, I may be permitted to say that the progress of psychology is, I think, in a great measure to be sought for at the hands of the members of the medical profession. In physiology I am convinced that pathological and clinical observations have done more than experiment to elucidate function; and in like manner I have little doubt that the study of morbid and limited and incomplete mental and cerebral manifestations will throw a great deal of light on some of the most abstruse questions in the relations of matter to mind. It will be bringing into action the logical method of difference, the ascertaining the influence of the removal of part of the cause on the effect. Now, in assisting in the solution of these grave problems, I think our function as medical men is in the main a limited, although a highly important one. Our obvious duty is to collect such a body of facts as will afford a sure foundation for future generalisations. Besides the states of marked and more or less well-defined disease, which enter of right into our nosological classifications, we have a wide field in examining into the influences of habit and heredity, the cerebral peculiarities which, more or less transformed, descend from generation to generation, constituting an "innate preparedness" for the development of particular morbid phenomena; the relation between vice and disease, and the question of when criminality implies merely pathological conditions.

I think we should avoid, at least for the present, the more ambitious philosophical attempts which have exercised during many generations a powerful influence on some of the highest intellects of our race. We need not attempt the great metaphysical questions of substance, reality, the nature of consciousness, the ontological nature of space and time, the essence of causal action, and the like. The domain of the clinical and pathological observer is a humbler, but we may fairly congratulate ourselves a more fruitful one. Just as biology concerns itself with the manifestations of life, and puts aside all theories regarding its nature and origin, just as in fact all sciences have resolutely to set aside at the beginning a certain number of unsolved questions, so we may fairly relegate these problems to other and more competent authority.

Nor do I think we should gain much at present by attempting to form any wide generalisations. A working hypothesis is no doubt of the highest utility in an experimental science, even if it ultimately comes to need to be corrected or to be altogether abandoned; and if the facts which come before us were capable of being called into existence or of being modified at pleasure, such an hypothesis might be necessary for our guidance. But we have to deal only with phenomena not susceptible of voluntary modification, and what we have to do is simply to observe them with accuracy and to record them with fidelity. In these observations the materialist who regards mind as a form of motion in the brain cells, and the spiritualist who looks on it as an immaterial principle underlying the phenomena of consciousness, although acting through the nervous system, can work together in perfect harmony, as the problem is to observe and analyse the phenomena brought before them. Even in this task there are limits set to our observations which it is not easy to surmount or evade.

Physiologically it seems improbable that we shall ever be able to identify or to estimate accurately the results of mental activity in the shape of oxidation products of brain substance. The weight of the brain is about 2 per cent. of that of the body, and we can hardly doubt that in mental processes only a small portion of the cerebrum is employed at any given time. Besides, we have no measure of the relative degrees of intellectual exertion, and consequently cannot express them in terms of potential energy.

The nerve cell must doubtless be accepted as the ultimate unit of the nervous mechanism, and the nerve fibre plexus as containing or constituting the channels of communication between these elementary units of cerebral activity. When we come to localisation of function, with the exception of the motor areas and Broca's convolution, and some further fairly definite areas concerned in disturbances of language, we have little well ascertained.

If, as is hoped, we can make out that in the brains of the insane special areas are differently and disproportionately affected, it is not unreasonable to suppose that these areas

may ultimately be ascertained to be connected with special functions. Dr. Charlton Bastian long ago expressed the opinion that the posterior lobes of the cerebrum are the most important for intellectual purposes, and this view has received the high sanction of Dr. Hughlings Jackson. On the other hand,² Dr. Bevan Lewis lays down without hesitation the following principle regarding insanity. He states that, while acute insanity may be regarded as a very general implication of the sphere of mind, and hence of a widespread disturbance of the cerebral cortex, its morbid results on the brain are decidedly concentrated on the motor or fronto-parietal section of the hemispheres. We learn from these conflicting opinions how little is definitely ascertained regarding the most important developments of cerebral activity.

If I might indicate some definite lines on which medical observation might be of the greatest value in elucidating some unsettled problems, I should be inclined to name among others the aberrations and decay of memory. For this species of observation no apparatus is necessary, and the opportunities are daily offering themselves, and most abundantly to the busiest practitioner. Have we as yet any sufficient number of facts to justify the dissolution view of the decay of memory: that is, that in the decay of memory there is a certain definite sequence of events? The law of regression, as it has been formulated by Ribot, corresponds to the general principles of dissolution as a reversal of evolution which have been enunciated by Dr. Hughlings Jackson with his usual force and ability. The process of decay would then go on in a regular gradation, from the complex to the simple, from that which has been least thoroughly organised or incorporated into the brain to that which has been most so, from the least to the most automatic of our acquisitions, so that we forget first recent events, then intellectual acquirements, then the impressions which belong to the domain of the feelings, and finally, how to perform automatic acts.

All this of course depends on a supposition that a physical modification of some of the very many millions of cells of the cortex of the brain takes place, originally, in connection with the mental process which memory revives, this modification constituting the organic basis or anatomical substratum of memory. It is suggested that it is in this way that we can best comprehend the retention of impressions which are for a time absent from consciousness just as it is the intercommunication of the cells which enables us to conceive how the impressions can be revived. But is this law fairly established? When we reflect on the enormous number of instances in which memory suffers notable, and so to speak, pathological decay in age, it would seem easy to collect and classify such a number of facts as would put this doctrine on a secure footing. But I think this is far from being the case, and the number of exceptions seems to be so great, that we may fairly regard this law as, as yet in this important sphere, unestablished.

I have recently had the opportunity of witnessing a curious disturbance of memory in a young medical man, in whom multiple neuritis had arisen in consequence of much and premature exposure to cold after an attack of influenza. Besides the usual paralytic symptoms, his memory became greatly impaired. He gradually reached the point of forgetting the year and the month, became hazy about his personal identity, and was doubtful who his wife was, and where he himself was residing. *Nec domus, nec placens uxor*, were retained in his memory; but he still had a very fair recollection of the leading diagnostic and therapeutic facts about his profession. He had forgotten a great deal, but the platysma myoides was fresh in his recollection, and the differential diagnosis of fluid in the pleura from consolidated lung was retained firmly. These facts, I cannot but think to the no small credit of his teachers, were so organised in his brain that they resisted dissolution.

The phenomena of aphasia, which have been so much studied and about which so many curious facts have been ascertained, bring us in contact with a most interesting problem: the relations of thought to language. It is I think doubtful whether without words any continuous reasoning can be carried on, and it is pretty certain that in the absence of the symbol no abstract reasoning could take place. According to the fine illustration of Sir William Hamilton, all

² *A Textbook of Mental Diseases*, Bevan Lewis, p. 489.

considerable progress in thought must be accompanied by a corresponding development in language.

"You have all heard of the process of tunnelling through a sandbank. In this operation it is impossible to succeed unless every foot, nay, almost every inch in our progress be secured by an arch of masonry before we attempt the excavation of another. Now, language is to the mind precisely what the arch is to the tunnel. The power of thinking and the power of excavation are not dependent on the words in the one case or the mason work in the other; but without these subsidiaries neither process could be carried on beyond its rudimentary commencement. Though therefore we allow that every movement forward in language must be determined by an antecedent movement forward in thought; still unless thought be accompanied at each point of its evolution by a corresponding evolution of language, its further development is arrested."

Now, when we find that a special damage in one situation makes us lose the power of reviving the recollection of the word, although we recognise it when heard; that damage in another region so affects us that the sight of the word does not call up its mental representation, although we see the word plainly; and that lesions in a third region have as their result that the sound of a word will not call up the corresponding idea, although we hear the sound of the word distinctly; it is impossible not to recognise that here we have got a good way in making out the very mechanism of this potent instrument of thought, and it is difficult to see in what other way we could have arrived at a similar comprehension of these complex and refined activities. We learn from facts like these how great a part the observation of the dislocations and derangements of important functions can play in enabling us better to understand the scope and nature of the function itself.

Few things are more noticeable in connection with this subject than the amount of research which is being conducted on the subject of experimental psychology. In this direction much of the best work has been done in the Leipzig Psychological Laboratory by and under the direction of Wundt, but kindred investigations are being made by various observers. The researches on the intensity and the time relations of sensation and of motor response to stimuli are of the highest interest. They have enabled us to ascertain the time occupied by mental acts, by the reproduction of impressions, by acts of association, and by logical judgments. The amount and quality of work done in this direction justify the hope that psychology, as a natural science, will take its place beside physiology, and that the physical basis of mental activity will be more and more understood and elucidated.

I have dwelt, at perhaps undue length, on this aspect of my subject, partly because it has a direct bearing on the relation of medical science to other branches of knowledge, and partly because it furnishes a convincing proof of the claim of medicine to take a leading part in the elucidation of important psychological problems.

Again, to take an instance of how medical experience can correct psychological speculation, we may, even if it be a little ungracious, select an example from the writings of a great thinker to whom many of us are under deep intellectual obligation, Mr. Herbert Spencer. This eminent psychologist³ attributes an importance to the circulation in the brain which physicians would be inclined to regard as excessive. He states that quickening of the circulation in the brain causes a rush of unusually vivid ideas, and makes the memory more distinct than usual. He contrasts the delusions of delirium as exemplifying the extreme vividness with which revived feelings may arise when the cerebral circulation is excessive, and the loss of consciousness caused by cerebral anæmia as exemplifying the converse result. Now, we have ample opportunity of knowing that anæmia is a fertile source of delirium, as the term "inattention delirium" indicates, and while there is much that is doubtful in that most obscure chapter of pathology which deals with hyperæmia of the brain, we know that it is at least as likely to produce somnolence and coma as it is to produce illusions. If the rapidity of the blood current were so potent as Mr. Spencer supposes, physical exercise ought to heighten the receptivity of impressions and there would be even a perceptible increase in the

erect as compared with the recumbent position. As a matter of ordinary observation, it is found to be difficult to collect our thoughts when the circulation is much accelerated by rapid exercise, and hardly possible to carry on a train of reasoning requiring any considerable exercise of memory. Indeed it has been urged by Schroeder van der Kolk⁴ that a free communication exists between the arteries and veins in the pia mater so as to allow a considerable portion of the blood, when the circulation has been quickened, to pass away over the cortical substance without entering its tissue at all, and thus to avoid the disturbance which its rapid passage through the capillaries of the brain would cause. In this way, as he has put it, the storm sweeps over the brain without our perceiving it.

I have alluded to this comparatively trivial point to indicate how medical knowledge comes to have a direct bearing on subjects of wider and more general interest, and to show also how physicians, by bringing their special knowledge to bear on the solutions of some of the most interesting problems which can engage the human intelligence, can best vindicate the dignity of their profession, which will thus have the fairest prospect of again forming an important factor in promoting the intellectual progress of the race.

Nor even in a therapeutic sense will studies of this kind fail to bear fruit in enabling us to deal more rationally and more successfully with the morbid conditions of this important portion of the economy. It can hardly be denied that there is a tendency among the most enlightened members of the profession to attach a less overwhelming importance to the administration of medicinal agents, and to have recourse to the employment instead of them of what may be called physiological remedies in the treatment of the morbid conditions of the mind and brain. Light, air, nutriment, environment, the warding off of hurtful, the presentation of soothing impressions—these are more frequently and more successfully employed than the large class of nervines, of the remedial actions of which we are not so certain as we could wish; and when we add to these the so-called moral treatment, comprising amusement, occupation, and the like, we have enumerated most of the agents on which we rely with the greatest and the most assured confidence.

I do not wish to be understood as underrating the numerous and potent additions which have been made of late to our stock of nerve remedies. I like to know that they are being constantly added to, and that their actions are being more fully investigated and defined. I regard them in the light of a great arsenal of warlike weapons of the newest construction and the most perfect adaptation to their purpose, kept always ready for use and in a thoroughly efficient state of order and readiness; but as I regard it as the highest and most successful statesmanship not to be obliged to employ these powerful weapons in actual warfare, so we best vindicate the efficiency of our art by having recourse to our armaments only as sparingly as may be—confident, however, that at critical moments and in periods of active disturbance they can be employed with great and admirable effect.

It is a common and easy practice for writers to exercise their wit at the expense of the profession of medicine. Molière and Le Sage have condemned to immortality what was perhaps not a very gross caricature of some forms of practice in their day; but graver and weightier thinkers have lectured us on our shortcomings and have given us much well-meant advice. Now, there is nothing which gives us a higher idea of the ability of the earlier physicians than when we examine the opinions and theories which have been advanced by some of the most commanding intellects of the world in reference to medical subjects, and which are often ludicrous and absurd. The father of modern experimental philosophy, Bacon, brought a charge against physicians that they prescribed in too simple a manner and did not combine together a sufficient number and variety of drugs. It is but justice to say that a number of both ancient and modern therapeutists have applied themselves with no inconsiderable energy to relieve their profession from this reproach. The same great philosopher advised the employment of a peculiar bath to obviate the hardening effects of age, and he hoped by this means to promote longevity and to restore to the rigid frame of age the suppleness and freedom of youth. The bath was to consist of

³ *Principles of Psychology*, vol. 1, p. 237.

⁴ *Mental Diseases*, trans. by Rudall. London, Churchill, 1870, p. 36.

fresh blood, or if that were found loathsome it might be made of milk, butter, yolks of eggs, and the fatter kinds of flesh, with oysters and wine, and sweetened with sugar or honey. This extraordinary bath was to be followed by various anointings and frictions. It is hardly to be wondered, when one reads this curious prescription, that Harvey, who was said to have been his physician, remarked of him: "He writes philosophy like a Lord Chancellor."

Berkeley recommended, as is well known, his wonderful tar water as not only capable of remedying bodily disease, but as having a valuable influence on the understanding—an effect of matter on mind which we would hardly have expected from the great master of idealism. "Nor is it only useful to the bodies of infants," he says, "it hath also a good effect on their minds, as those who drink it are observed to be remarkably forward and sprightly." When we remember that when this passage was written Cullen and William Hunter were teaching medicine and anatomy, we have no reason to think that the physicians of that day had much to learn from the metaphysicians.

Kant, the most profound speculative genius of Germany, was strongly opposed to vaccination, which he called "the inoculation of bestiality," and he was enthusiastic about what he regarded as the great discoveries of Beddoes regarding the prevention and cure of consumption. One of these discoveries was the use of digitalis as a remedy for phthisis, which Dr. Beddoes regarded as opening out a brilliant era for humanity, as in his hands it cured a large majority of cases of this disease.

Now, when we see the notions which existed on the subject of medicine amongst these great and highly endowed thinkers, we can form some idea of the views which would have in all likelihood found favour among the masses of mankind, and the effects to which such views were likely to lead, and we can form, too, a fairly adequate notion of the superiority on their own ground of the contemporary leaders of medical science. We can see, also, what important services legitimate medicine has rendered to the world, even if it had only the negative merit of protecting mankind from disastrous and ignorant meddling. Physicians cannot accept the position of mere *curiosi nature*; in presence of serious disease they must act with the best means they possess. Failing in this duty they would be justly liable to the reproach of Mephistopheles—

To grasp the spirit of medicine is easy;
Learn of the great and little world your fill,
To let it go at last, so please ye,
Just as God will!

We must always remember that it is by its utility to the world that medicine must ultimately stand or fall, but we must use the word utility in its widest signification as comprising on the one hand all the special activities of our profession in preventing, or mitigating, or removing human suffering; and on the other all its incidental advantages in aiding the development and progress of human intelligence by taking its position along with other members of the group of sciences of observation.

It is to be regretted, but I fear it is inevitable, that the study of the old humanities must be curtailed, and must even in some measure disappear from medical education. Greek seems doomed past recall, and it will, perhaps, be possible to say at some future day of the medical profession, as Petrarch said of Italy in the fourteenth century, that it did not contain more than ten persons who could appreciate Homer. And yet in putting aside Greek, medical men will miss some of the finest products of the human intellect moulded in the most perfect form. Many of those who take an interest in the study of the subjects I have been imperfectly advocating will be glad to be reminded of what is surely one of the most touching passages in ancient literature, that in which the scene before the death of Socrates is related in the "Phædo" of Plato, when the illustrious old psychologist, after his fetters had been removed, began to bend and rub his leg where the chain had galled it, saying as he rubbed: "How singular is the thing they called pleasure, and how curiously related to pain, which might be thought the opposite of it; for they will never come to a man together, and yet he who pursues either of them is generally compelled to take the other." Our psychologists are to-day still busily engaged in investigating the same problem.

Latin will make a harder fight to maintain its place, and will probably succeed in retaining it. If it should fail it will be impossible not to feel a profound sense of compassion for the physicians of the future, if they are never to be admitted to the simple feasts at the Sabine farm, at which educated men have been charmed guests for so many generations; or if they are never to feel the beauty and finish of the hexameters of Virgil. I do not suggest that grace of style or elegance of diction is to be regarded as of intrinsic value in medical writings—

Res ipsa ornari negat, contenta doceri.

Works on a subject so changing as medicine are destined to a comparatively brief existence, and any prolonged or anxious care devoted to their form and finish would be alike unnecessary and fruitless. The classical latinity of Mead and Heberden has not saved their works from all but total oblivion. The same fate is destined, at no remote date, to overtake the eloquent periods of Latham, and the charming lectures of Sir Thomas Watson—lectures which it is surely not merely early prepossession which makes me regard as among the finest English prose of the generation which witnessed their publication. But good writing satisfies the literary conscience of the author, and gives a not altogether undesirable pleasure to the reader.

The pursuit of literature is everywhere being regarded as less necessary—and we must be of our generation—and from a utilitarian point of view it is impossible to give more than a passing regret to those branches of learning which have so long been regarded as the stamp and evidence of culture. What with unconscious irony are called the paying subjects are brought more and more prominently forward in general education, and those studies which bear on professional training will ultimately prevail to the comparative exclusion of all others. But it must be also borne in mind that it is not by the mere accumulation of scientific facts that the physician of the future will gain his most valuable training. It is by those studies which develop and heighten intellectual energy and aid in forming and promoting that flexibility and grasp of mind which enable it to deal with the varying problems which medicine presents in such abundance. It was remarked by Dugald Stewart that Locke owed some portion of his success as a psychologist to his medical training.

"No science could have been chosen more happily," he observes, "to prepare such a mind as that of Locke for the prosecution of those speculations which have immortalised his name; the complicated and fugitive, and often equivocal phenomena of disease, requiring in the observer a far greater portion of discriminating sagacity than those of physics, properly so-called; resembling, in this respect, much more nearly, the phenomena about which metaphysics, ethics, and politics are conversant."

It will always also be of great aid to the physician to be able in dealing with those committed to his care to recognise the influence on them of ideas of hope, of confidence, of endurance; to be able to deduct from their complaints what is the result of an impressionable nervous system and what of pure imagination; to solve, as nearly as may be, the personal equation. These capabilities will supplement beneficially the most refined and accurate physical diagnosis. We need not doubt that the multifarious aspects of disease, following, as they do, closely on the track of all the numerous and diversified forms of human energies and activities, will afford ample scope for the freest exercise of the highest scientific faculty, as well as for the employment of the most minute and patient observation. The tendency of the medicine of the future will no doubt be in the direction of greater specialisation. Physicians and surgeons will devote themselves, more and more, to the cultivation of a limited portion of the vast and always widening field of knowledge. Medicine must adapt itself to the varying necessities and requirements of the world. It must prove itself capable of supplying the wants of a civilisation, rapidly becoming more complex in its development, and therefore more varied as well as more exacting in its demands. It must press into its service all knowledge, physical and mental, likely to aid in the furtherance of its mission; accepting the help of its sister sciences, but allowing itself to be dominated by none of them. It must be alike flexible in its methods and steady in its aim; and it must be at once cautious and aspiring, always sane in practice, while bold in

speculation. But at the same time it behoves all those concerned in its guidance, or responsible for the instruction of those who are to become its members, to bear in mind its position as one of the main supports of the tripod of learning, as one of the great factors in the intellectual progress of humanity; being well assured that it cannot sacrifice any portion of its intellectual elevation and dignity without a corresponding sacrifice of its truest and most practical usefulness.

ADDRESS IN SURGERY

BY

WM. H. HINGSTON, M.D., LL.D., D.C.L.,

Surgeon-in-Chief to the Hôtel Dieu, Montreal; Professor of Clinical Surgery in Laval University.

At the Annual Meeting of the British Medical Association held at Nottingham, July, 1892.

ON SYNTHESIS IN SURGERY.

Surgical Unrest.—Surgical Diseases in Canada.—Surgery among the Aborigines.—Hospitals in Canada.—Specialisation and its Dangers.—Necessity of Synthesis as a Corrective.—A Plea for Liberal Education as a Preliminary to Medical Study.

THE feelings with which I rise to address so large and so distinguished an audience are a strange alloy of regret that I must needs fall short of my own desires; of confusion at finding that those to whom the same post of honourable duty has been entrusted in past years have left no branch of surgery untouched; and more than all, of dread lest my beloved Canada should suffer in your estimation at the hands of one who wants, not the will, but the power to do her justice on this momentous occasion.

Permit me, in my country's name, to thank you in all sincerity for the compliment paid to her in inviting one of her children to your shores, and in assigning to him a position of such honour in your deliberations—a position hitherto reserved for the most eminent of your own land—a land teeming with all that is great and noble in our art. Let me assure you that Canada is not unmindful of this fresh token of your regard. She is, as you well know, most firmly attached to the parent State; she glories in your past, she is deeply interested in your future; your glory is her glory; your future is her future; and she is grateful for any thought of her in your councils, especially where science is concerned, and where the common good of mankind is the object.

It was the desire, on our part, to be in closer touch with you which made it possible, last year, for that able and indefatigable worker, Mr. Ernest Hart, to successfully establish those more intimate relations which now so happily exist between members of our profession in the parent State and in the Canadian Dominion. Mr. Hart passed quickly from Vancouver to Quebec, and at his touch Branches sprang as quickly into existence as beacon fires were once lit on the summits of your Welsh hills.

Coming, as I do, to the very apex of surgical art from the wide circumference of its base beyond the seas, it might appear bold were I to attempt, as we sometimes do in Canada, to pass in review the advances in our art during a certain period. There we are accustomed to glean from the United Kingdom, France, Germany, and other countries, the best fruits of their workers, and to place them before the profession, stamped, for the most part already, with the mark of your and of their approbation. But that would here be dangerous, for an address of that nature—however carefully prepared, nicely adjusted, thoroughly combed down, complete and fashioned in all its parts, when leaving the western hemisphere, might, on its arrival here, be found to be wanting in the most recent of its important features—features with which you, in the meantime, might have become familiar—for the advances in our art excel in speed, sometimes, the swiftness of ocean travel.

It has been found by some of my predecessors in this rostrum that the advances in surgery have been so great and so important that to follow them at all closely in their many ramifications would be impossible. This difficulty seems to

have occurred to my immediate predecessor—the learned Edinburgh surgeon—and, in his admirable address, he turned at once, and for relief as it were, to surgical rest. But the rest, aptly termed surgical, for which Professor Chiene, following Mr. Hilton, had secured so much attention was objective. It seems to me that with this much needed surgical rest there runs *pari passu* a surgical unrest which is subjective, and which will be my text for a moment.

On this the eastern side of the Atlantic, where, in every branch of commerce, in every trade and handicraft, in every liberal art, in every learned profession, the lines which divide the work to be done by each are, for the most part, clearly and distinctly traced, the ceaseless agitation of life is marvellous, and would seem to favour the view long ago expressed by De Quincey that solitude was, even in his time, becoming a visionary idea in this country. Yet to me, a visitor, it appears life here is calm, quiet, placid when compared with that on the western continent. Here there is time for easy and familiar intercourse; there it is grudgingly given. Here you leisurely perform the functions necessary for the repair of wasted tissue, and the reception of food, recreation and sleep have each their due time allotted to them; there they are unduly curtailed as things which might be realised and converted into currency. This state of unrest everywhere—but especially in the western world—is not favourable to the surgeon, the full capabilities of whose intellect are not unfolded without sufficient occasional leisure and thought and retirement, all of which are, in some measure, denied to him in our new and over-active world. With you, as with us—but, as it seems to me, not so much with you as with us—the average surgeon of to-day is less a man of thought than a man of action. He is constantly liable to disturbance, either from the particular character of his calling, or from the agitation of all around him, of which he soon partakes. He is made to eschew the more meditative habits which would the better fit him to weigh well and to adopt or reject what should be adopted or rejected, without reference to authority, or without being swayed by the influence, not always safe and reliable, of superiority of position or of condition.

Perhaps, at no time in the history of our art have the facilities been greater everywhere than they are at present of arriving at conclusions which may not be sound, and of being misled by representations which may not be strictly true. In the few intellectual centres, in ancient times, opinion was gradually formed in solitude. It advanced in regular progression, and from mouth to mouth, as it were. To-day, with steam and electricity and the wondrous and unceasing development therefrom of vast physical agencies, men are brought nearer to each other. Truth, to-day, travels with the speed of lightning; but error also, and with like rapidity. Opinion, formed in large centres, acts especially on the imagination of those around, and more powerfully still, perhaps, of those at a distance. It does not always convince, but it impresses, and, to quote the words of a classical writer, it has the force of authority rather than of reason; and concurrence in it is not always an intelligent decision, but a more or less blind submission. Our minds are often misled by misrepresentations, and they remain misled till other and truer representations put them right again.

Surgical opinion, in an especial manner, is at first, and for some time, what seems to be thought by every one in general, and by some one, or perhaps no one, in particular. An opinion hurriedly expressed by eminent, or even prominent, or perhaps only self-beguiled authority is adopted; it is propagated; it becomes the opinion of the general body, and although we may have resisted the influence of the individual authority in the first instance, we finally succumb to the voice of that general body of which we are constituents—each part having, without perceiving it, perhaps, done its share in diffusing truth, it may be in extending error.

The views on surgical questions, expressed ere they have been fully considered; hasty reports of surgical cases, and premature records of surgical operations—especially if the operations have been bold and novel—when published within a few days of their performance, are often misleading. Had the publication of so-called successful cases in medical journals for its sole object the elicitation of truth, error in time would be of small moment.

The haste in publishing enables the operator to scatter re-