AN ADDRESS

DELIVERED AT THE OPENING OF

THE SECTION OF PHARMACOLOGY
AND THERAPEUTICS,*At the Annual Meeting of the British Medical Association, held in
Cardiff, July, 1885.*

By THOMAS R. FRASER, M.D., F.R.S.,

Professor of Materia Medica and Therapeutics in the University of Edinburgh.

THE PROGRESS OF PHARMACOLOGY AND THERAPEUTICS.

THE British Medical Association has now been in existence for upwards of half a century. In this period of time, it has accomplished much that may be contemplated with satisfaction. It has rendered valuable service to the medical practitioner by the diffusion of information through its JOURNAL, and by binding into one united body the great proportion of the medical practitioners of this country, thus giving to the profession a valuable organisation for self-protection and advancement. Above all, it has actively fostered the advancements made in knowledge bearing upon the healing art, and in no more effective manner has it done so than by recognising the differentiation of knowledge, by assigning the consideration of special subjects to departments which have from time to time been instituted. For many years this recognition has been accorded to the subjects of medicine, surgery, and obstetrics; more recently to public medicine, medical psychology, and ophthalmology and otology; and, only last year was there, for the first time, instituted the Section of Pharmacology and Therapeutics, whose second meeting we have now met to inaugurate.

I do not, gentlemen, feel disposed to attach any blame anywhere or to anyone for what may by some be regarded as a tardy recognition of the claims of pharmacology and therapeutics. The administrators of this Association have always most fairly recognised and given effect to the just claims of every subject, and they have admirably reflected the best opinion of our profession. Medicine is a progressive subject. Its special departments have been produced and created by the process of evolution that everywhere marks progress in Nature and in the knowledge of Nature.

In the beginnings of medicine, whether contemplated in primeval time or in coeval time, among peoples who have failed to make any substantial advance in the mental state of their earliest ancestors, therapeutics is found to occupy a position of great importance. It is entrusted to functionaries whose position in the social economy is generally one of great dignity, and it is exercised with the concomitants of the superstition on which it is founded and maintained.

Wherever the civilising influence of knowledge had extended itself, inquiry was originated into the structure of the body, and a prosecution of this inquiry led to the founding of the science of anatomy. The function of structures then engaged attention, and physiology became a science. Observation, in the course of time, revealed alterations in structure in connection with disease, and so morbid or pathological anatomy was evolved. Crude observation, as distinguished from experiment, was in medicine the great means of extending information; and as therapeutics—both surgical and medical—could not cease to engage the chief attention, such observation governed and directed the exercise of the function of healing.

But therapeutics requires for its advancement more than mere observation in disease; and, therefore, it has been that, for many years after anatomy, physiology, and pathological anatomy had attained great and important developments, therapeutics continued to be a vague and unsatisfactory art, veering, like a weather-vane, under the influence of theories propounded from insufficient data; at one time dominated by the absurdities of the doctrine of signatories, and, at other times, by the equally erroneous systems of Paracelsus, Stahl, Brown, Rasori, and others.

A new era, however, was entered upon early in this century, when Bichat and Magendie recognised the necessity for ascertaining the actions of remedies by experiments, and thus founded the science of pharmacology. This science—the science of the action of remedial substances—deals with the changes produced in normal physiological conditions by the influence of substances used as remedies. It con-

cerns itself with the elucidation of the changes, with determining what remedies do. The attaining of this knowledge by clinical observation in conditions of disease is, I believe, a task of insurmountable difficulty. The problems must be studied apart from the complications, and apart from the departures, at present generally unknown, from normal conditions, which are met with in disease. In this manner, the science of pharmacology has been prosecuted since its origin. The results already gained have extended the resources of therapeutics by increasing the number of remedies; and, what is of greater importance, by enabling us to apply remedies with a more definite understanding than before of the nature and limits of the changes which they are able to produce.

But, gentlemen, if, by any further prosecution of pharmacology, an exact knowledge, approximately complete in every detail, should be gained of a considerable number of remedies, shall we then be in a position to apply this knowledge adequately to the cure of disease? There is no shadow of a doubt that we shall gain much; precision will be obtained in administration, errors in selection will be avoided, and probably, in a few cases, successful applications will be possible where the pathological changes are of a simple kind. It would be folly, however, to conceal from ourselves that therapeutics does not depend upon pharmacology alone, however perfect this science may become.

The application of pharmacological knowledge to the cure of disease constitutes a problem which is altogether separate from that of determining the action of remedies. The former, indeed, can only be successfully accomplished when we have ascertained, with some approach to definiteness, what perturbations from normal physiological conditions are present in disease. Pathology, therefore, bears a very similar relationship to therapeutics to that which pharmacology bears—I do not restrict the word pathology to the science of morbid anatomy simply. This department of it has received a remarkable development, and the information now acquired is of great interest and importance. Even the most perfect knowledge of the physical conditions of diseased tissues is, however, only of secondary value to therapeutics. It is necessary that the exact changes from normal functions should be ascertained, and that pathology should determine and gauge the kind and degree of the changes which exhibit themselves as symptoms of disease. Morbid anatomy has hitherto occupied a much larger share of attention than this pathological physiology of which I speak. The evolution of the latter may well be compared with that of one of the two fundamental biological sciences on which it is dependent; and as the development of anatomy constituted the necessary antecedent to that of physiology, so there is every reason to believe that the development of pathological anatomy will lead to a great extension in the subject of pathological physiology.

To the therapist, and, therefore, to the medical practitioner, the progress of physiological pathology is of as great interest as that of pharmacology. In the meantime, neither subject has advanced further than the threshold of its possible development, and, naturally, the benefits which have been conferred by them upon therapeutics are not as yet conspicuously apparent. Their development is, for the most part, wanting even in that equality and symmetry which is required for practical application. In only a few instances can we find that each has made sufficient progress to benefit therapeutics; as, for example, in some of the applications of the pharmacological action of nitrites, or of digitalis, or of several diuretics to the treatment of disease. In many instances, neither has attained the development needed before the greatest good can be conferred on therapeutics; as in the case of our defective knowledge alike of the essential processes of fever and of the pharmacological action of quinia, or of the salicyl-compounds, or of other antipyretics; while, in many other instances, the existing knowledge in the one subject is greater than that in the other, as in the case of the pharmacology of atropia, in whose numerous therapeutical applications the essential pathological changes are still unexplained; and as in the great achievements of physiological pathology in the domain of septic influence, where pharmacology is still unable effectually to aid therapeutics.

However gratifying may be the recent progress of both pharmacology and therapeutics, we cannot pretend that they have reached the position of many other departments of medicine. Far, therefore, from experiencing any resentment on account of their recognition, only last year, as independent departments in this Association, I am grateful for the favour that has been bestowed upon them. I am especially grateful for the encouragement which this recognition conveys to what, after all, are subjects which have obtained but a feeble development contrasted with what I am sure their capabilities must lead to. That yet distant result must be awaited by us with patience, and should be furthered by perseverance and untiring exertion. In

pharmacology alone the work before us is immense. Devoted labour, however, will accomplish much, and we are told,

"No fort so forcible, no wall so strong,
But that continual battering may rive."

Patience must also be exercised to enable us to avoid the great danger to therapeutics, a desire too hastily to gain results which is constantly besetting us. It has manifested itself in all ages, in a search after specifics—so called—a search which tends to distract from solid work in pharmacology, where the results are certain to be more valuable and more conducive to the ultimate benefit of therapeutics.

My remarks have indicated that I regard pharmacology as one of the means by which the great aim of medicine—the healing of disease—is to be gained. It is an essential means, and it therefore becomes of importance to arrive at some clear conception of the methods by which the investigation of pharmacological problems is best to be effected.

Two methods seem to be open to us. The first I would refer to is that of the study of the effects produced by remedies when they are administered in disease. This constitutes the old method of simple observation. Its results are, unfortunately, too apparently unsatisfactory to require any elaborate criticism. Even when the problems are of the simplest description, fallacies that are destructive to the scientific value of the results can scarcely be avoided. Observations of this kind have been industriously collected for centuries, and therapeutics has, nevertheless, advanced with so slow and tardy progress that it is open to doubt if much real progress has been effected so long as this method alone was followed. The collection of masses of such observations constitutes a development and expansion of this method; but, as my predecessor in the position I now find myself very ably emphasised the objections inherent to it, at the opening of the first meeting of this Section, I shall not do more than refer to it as a method very limited in its value, and open to the objection that it is likely, unless carefully directed, to impede rather than advance the progress of therapeutics, by conferring an appearance of scientific accuracy, which statistical compilations and forms tend to do, upon observations that, separately, are of comparatively little value. I believe, at the same time, that some slight advantage, some trivial progress, as contrasted with the possibilities before us, may be gained by it. The experience of a fairly well trained practitioner may, for example, be of use in establishing the fact that a substance is generally able to produce sleep, or to lower abnormal temperature; and the collection of such experiences may assist in determining the relative value of substances acting in this manner, and of establishing the doses that should be administered of them. But even here, gentlemen, the requirements of therapeutics are only superficially met. Sleeplessness and pyrexia are but manifestations of many descriptions of departure from physiological conditions; they are but symptoms producible by many pathological processes. The exact nature of these processes has yet to be defined by physiological pathology; and it is not probable that each of the abnormal processes leading to sleeplessness, or leading to pyrexia, will be restorable to their normal state by every substance that is capable of producing sleep, or by every substance that is capable of reducing temperature. Here it is that the insufficiency of the method of simple observation in disease becomes apparent. On the other hand, when the essential nature of the pathological processes has been defined, the pharmacologist must be prepared to produce the substance which will restore each perverted process to a state of health; and he will then be able to treat sleeplessness or fever with a definiteness and a hope of success which before were unattainable.

It is knowledge of this description which I understand to be the aim of pharmacology. To obtain it, we must continue that method of research which has founded the science. This, no doubt, is a method of observation, but it is one in which the conditions are more simple and controllable than in observation on human beings, and especially on human beings suffering from disease. Magendie, Bichat, and since their time a host of experimenters, have recognised this as the true and only method by which the knowledge of remedies which is necessary for the cure of disease can be obtained, and I cannot too emphatically state that it is only by this method that we can ever hope to utilise thoroughly the means so abundantly placed at our disposal for placing therapeutics in a satisfactory position. Our object is not a selfish one; every advance in therapeutics results in the common good of humanity. If it be a worthy object to aim at the lessening of suffering, the prolonging of human life, the prevention of premature death, then I say the study of pharmacology by experimental investigation not only requires no apology, but the neglect of this study imposes a heavy responsibility upon those who place obstacles in the way of pharmacological research.

Even now, with a pharmacology and a physiological pathology far removed from the development they are capable of attaining, and, I firmly believe, are destined to attain, therapeutics has gained many valuable acquisitions. It can justly be claimed that physical suffering has been greatly reduced, and it can even be claimed that death may be prevented. There are not a few instances in which the justice of the latter claim may be established.

Let us recall for a moment the condition, familiar to all of us, of a patient suffering from the more severe effects of obstruction to the circulation caused by a cardiac lesion. The cellular tissues of the body, every cavity and structure in which liquid can collect, are occupied to distension with serum; the face is livid; the pulse is irregular, flickering, and so feeble as to be uncountable; the breath is laboured, and only possible when the patient is propped up in bed; the urine has ceased to be produced by the engorged kidneys; and, even to the most unskilled observer, it is obvious that the continuance of life will, in all human probability, be only a brief one. A few doses of digitalis are given, and, should the heart be capable of reacting under its influence, the condition of suffering and danger is, by-and-by, removed.

To pharmacology we are indebted for the knowledge which has led to this striking therapeutical application; and, by further cultivation of this science, in association with pathological physiology, many other similar triumphs will, I am satisfied, be obtained. Judging from accomplished facts, it is possible to proceed further, and to anticipate that, in the future, therapeutics will become as scientific an art as that, for example, of the engineer. We are now able to produce by pharmacological agents definite perturbations in the physiological function of many structures, and each of these perturbations is actually a disease, differing, however, from natural diseases, in so far that the exact conditions are known. By means of other substances, whose action has also been accurately determined, we can restore the perverted functions to the normal condition, and thus cure the disease. We may even proceed further, and by producing perturbations of a kind and degree that would, if unarrested, assuredly result in death, we can administer a substance which will restore these perturbations, also, to the normal condition, and thus we succeed in curing a fatal disease, and in indicating the brilliant possibilities of therapeutics, founded upon the scientific bases of pharmacology and pathological physiology.

Having referred, gentlemen, to the methods of study which are most likely to advance pharmacology, I wish now to make a few observations on the means that suggest themselves to me for the encouraging and furthering of this study. Recognising the important influence exercised on any subject by its position in the curriculum of medical training and education, I would first express the opinion that the time has now arrived when the intimate association which has so long existed between pharmacology on the one side, and pharmacy and the physical characters of remedial substances on the other, should be severed. This has already been done in several teaching-institutions. We in Scotland have effected a sufficient separation in several of our universities; and in two or three of the London schools, in Manchester, and elsewhere, it has also been done. One of the many advantages that is thereby secured is that pharmacology may be taught at a period in study when its facts can be properly appreciated. It deals with perversions of functions produced by active substances, and therefore requires some acquaintance with physiology before instruction in it can be intelligently followed. Another advantage produced by this separation is that pharmacology thereby receives an amount of attention corresponding to its importance, in place of being, as is still too often the case, relegated to a position which is sometimes even inferior to that of the comparatively unimportant subjects of the natural history, physical characters, and chemical reactions of drugs. Pharmacology cannot, I am convinced, be adequately taught before the third session of a curriculum of four years, while its teaching would be inconveniently delayed were it advanced to the fourth session. Its association with therapeutics might, however, be attended with some advantages, and one of the greatest would be the emphasising of the distinctions between the two, as well as of the relation of the one to the other.

In order to further the study of pharmacology, I would also suggest that in every important centre of medical education, laboratories for investigation should be established. In Germany and in France, many such laboratories are to be found, and, in some cases, as in the Universities of Berlin and Strasburg, they are of palatial dimensions and elaborately equipped. If I were to except Manchester, where, I believe, an excellent laboratory exists, and the University of Edinburgh, where we have recently made provision which can compare not unfavourably with that existing in Germany, I am not

aware of any centre of medical instruction in this country where the special accommodation and means for pharmacological research are not of the most meagre description. Every argument, however, that can be urged in favour of laboratories for physiological or chemical research can be urged in favour of laboratories for investigating the action of remedies; and it is to be hoped that this want, which constitutes a reproach to medical science in this country, will be speedily removed.

I have not dealt with therapeutics in the same direct and special manner that I have with pharmacology. Only to-day, it has formed the subject of an able address from my friend Dr. Roberts, of Manchester. It is, besides, obvious that the claims of therapeutics to our best attention require no advocacy. The subject is ever present with us in our daily avocations. For centuries, it has engaged attention in every community. Wherever disease exists, there also the means for curing disease is inevitably brought under consideration. Were we not in this Section to offer to it a congenial home, it would remain, as it hitherto has done, an adjunct of the Section of Medicine. Indeed, it yet appears coy in receiving our attentions, and unwilling to depart from that Section; for I find that a discussion has been arranged on the treatment of acute rheumatism, and that several papers of a purely therapeutical character are to engage the attention of the Section. Such subjects may perhaps, in the future, be properly transferred to our Section. But, gentlemen, as I have already said, a danger may be incurred by prematurely elevating therapeutics to a position of independence. Traditions cling to it which impede its progress, and its growth has been forced by inevitable circumstances. The danger of stereotyping its traditional methods by appearing, in any way, to acknowledge them as sufficient, should not be overlooked. Although it has even now attained to a position of great value to mankind, and of just pride to our profession, it is necessary that it should await the further development of pharmacology and of pathological physiology before it can enter upon the certain and brilliant future of success, which at present is only dimly foreshadowed.

I have not thought it necessary to enlarge upon the present state of pharmacology and therapeutics, by describing any of the more striking advancements made in recent times. Had I thought it necessary to do so, I should, in the case of pharmacology, have made some detailed reference to the valuable results that have been gained by the examination of many substances elaborated by the chemist. I have especially in view the carbon compounds of the aromatic and fatty series; among the former of which, there occur such substances as chloral, butyl-chloral, paraldehyde, iodoform, nitrite of amyl, and nitroglycerine; and among the latter, the salicyl-compounds, quinine, kairine, and antipyrine. Chemistry has also succeeded in reproducing in the laboratory, substances with which we are familiar as natural products. Such substances, for example, as conia, caffeine, and theobromine, can now be synthetically produced, and success has nearly been obtained by Ladenburg in producing atropia, in the course of his classic research on the chemistry of the mydriatic substances. The time may arrive when Nature's products will be supplanted in our organic materia medica by the creations of the chemist.

A reference to our programme renders it unnecessary also that I should describe any of the more recent advances in therapeutics. The discussion on Anæsthesia will serve to remind us of one of the greatest boons which modern research has conferred upon humanity. The value to therapeutics of instruments of precision to guide us in applying remedies will be illustrated by the teachings of the sphygmograph during their administration. The great therapeutical acquisition gained by the process of hypodermic injection will be amply acknowledged during the discussion on the paper which we are promised on this subject. The alleviation produced in some of the most painful and distressing of diseases by the nitrites, and the conspicuous therapeutical effects of digitalis and its substitutes in certain cardiac diseases, and in the toxæmia resulting from defective renal excretion, cannot fail to be brought under our attention in the consideration which will be given to these subjects.

The programme which has been arranged for us will, I am confident, amply justify the institution of this Section. I trust that our proceedings may also afford encouragement and incentive for further work, designed to aid in the advancement of the great object which we together aim at—the conquering of disease by increasing the therapeutic resources of practical medicine. We are, indeed, fortunate in being able to advance this object by engaging in pharmacological and therapeutical investigations, which are in themselves of the highest interest, and which derive an additional attraction from the assurance that every acquisition we may succeed in gaining enlarges the opportunities for diminishing suffering, and for conferring benefit upon our fellow-men.

FIFTY-THIRD ANNUAL MEETING

OF THE

BRITISH MEDICAL ASSOCIATION.

Held in CARDIFF, July 28th, 29th, 30th, and 31st, 1885.

FIRST GENERAL MEETING: TUESDAY, JULY 28TH, 1885.

The first general meeting was held in the Town Hall, Cardiff, at 3 P.M., on Tuesday, July 28th.

The chair was taken by Dr. J. CUMING, President for 1884-85.

The minutes of the last annual meeting and of two special meetings were taken as read (having been published in the JOURNAL), and confirmed.

ADDRESS OF RETIRING PRESIDENT.

Dr. CUMING said: Gentlemen, the period has now arrived at which it becomes my duty to lay down the office to which you elected me a year since, and to return you my most sincere thanks for the honour which you then conferred upon me, and for the generous assistance and consideration which I have received in my endeavour to fulfil the duties which that honour entailed. In bidding you farewell as your President, I have nothing but words of encouragement to utter. The success of the Association may be in some degree measured by its numbers, and it is a matter of great satisfaction to find that there are no indications of its onward progress being arrested; on the contrary, the tide of its prosperity seems to rise steadily higher. It is also alike gratifying in the present, and hopeful for the future, that the work of the Association is being carried on with increasing vigour and efficiency in the intervals between the annual meetings. In the vigilant care exercised in the interests of the public as regards legislation; in the prosecution of collective investigation—a work so eminently, I might almost say so exclusively, our province; and in the fostering and encouragement of original research, the year which has passed can show a record of activity which has not been previously excelled. I look with especial pleasure to the increased assistance which is being afforded to scientific inquiry, because, among our aims, the advancement of medical science ought to occupy a place not less prominent than the interchange of thought—the promotion ought to be considered as well as the diffusion of knowledge. It has always seemed to me to be appropriate and fitting that this great professional organisation should be conducted in a spirit akin to that with which the action of the individual professional man should be inspired; that it should risk its success, not in striving after general or striking impressions on the public, but in doing its proper work, steadily, perseveringly, unostentatiously, sure that its objects will be best attained, and its rewards most surely reaped, not by loudly asserting its claims to public consideration and importance, but by giving practical evidence of its title to be regarded as a source of benefit to the community. Gentlemen, the visits of the Association to Ireland are sufficiently rare to make each of them deserve more than a passing mention. If they are unfrequent, I have reason to believe that they are to be reckoned among those which have left the most agreeable recollections in the minds of those who have been present at them. In Dublin and in Cork ample proof was given, if proof had been needed, of the high standard of qualification attained by the members of the profession in Ireland, of the warm interest which they take in everything concerning our art, and of their appreciation of the tie of brotherhood which unites all engaged in the same scientific pursuits. I hope that the more recent meeting in Belfast has in some additional degree tended to draw us all more closely together, to promote a better knowledge of each other; and to bring about what, in my mind, is certain to follow from a better knowledge, a greater mutual respect and regard. It was to me a deep satisfaction to share, even in a small degree, in the pleasant labours which that meeting entailed, and to witness the cordial spirit of co-operation which was evinced by every one. And now it only remains for me to resign the chair to one who is in every respect worthy to occupy it, whose character and abilities have earned for him the confidence and esteem of his brethren and of the important town in which we are assembled; and under whose guidance we are commencing what I have no doubt will be an interesting and successful meeting. Permit me to offer to one and all, President and members of the British Medical Association, my heartiest good wishes.

The chair was then taken by Dr. W. T. EDWARDS, President for 1885-6.

Vote of Thanks to Dr. Cuming.—Mr. MACNAMARA (London) moved: "That the cordial thanks of the Association be given to Dr. J.