AN ADDRESS

DELIVERED AT THE OPENING OF

THE SECTION OF OPHTHALMOLOGY.

By WILLIAM BOWMAN, F.R.C.S., F.R.S.,
President of the Section.

GENTLEMEN AND DEAR COLLEAGUES,—Many of those whom I have the happiness and honour of now addressing will be able to recall the proceedings of the fourth International Congress of Ophthalmology when it met in London nine years ago. Our branch of practice on that occasion stood in a sort of isolation, separate from the rest of the body medical, moving in an orbit of its own. In that isolation it had during many years set an example, which was in due time to be followed by the General International Medical Congresses, of which the seventh is now being held in our Metropolis. To-day we are obviously one among many members of the entire medical commonalty, and our work is admitted to be of the highest value, not only for its own sake, but for the beneficial influence which its aims and methods exercise over the whole field of medicine.

In the brief interval since 1872, our President of that year, Professor Donders, has been called upon to occupy the still more honourable post of President of this General Congress, at Amsterdam. Let us greet him here once again, now in both characters, with the respect and affection which are so much his due. We owe it to him that our calling has been much advanced and elevated by the unfolding of many new truths, and the free presentation of them to us in lucid array, so that all men could turn them to account in the ordinary every-day round of practice, to the great benefit of ourselves and patients.

On the occasion to which allusion has been made, it was the College of Physicians which offered us accommodation, that ancient English Corporation of the Sixteenth Century, which, at its original institution, comprised upon its rolls almost all that was greatest among us in medical learning and practice, and which now, with characteristic liberality, is doing its utmost, with our other brethren, to further the success of the present world-wide convention. It now happens, however, that our Ophthalmological Section of this Congress is domiciled otherwise, viz., in the rooms of an illustrious Society, the time-honoured representative among us of the whole range of natural knowledge, for the promotion of which it was laboriously founded; largely, we may reflect with pleasure, by the co-operation of men of our own profession. The circumstance is quite accidental, but it may serve to remind us of the deep and necessary connection of every department of medicine, our own in a marked degree, with the principles and subject-matter of the natural sciences in general. Man's body and mind have relations with the whole universe, and thus far extend also the aspects of those relations with which the healing art is concerned; which we study in man's interest, in order that we may understand how to modify or control them for his individual or general advantage.

As to these great modern International Congresses of the private men of various countries, (of which it may perhaps be said that the present one is already proving itself the largest and most remarkable of any), this room may remind us how lofty, how noble, have been the aims of some of the greatest intellects of the past, of whose achievements we find ourselves to be the fortunate inheritors. For it is science itself, and nothing less, in the persons of a series of its eminent cultivators in many countries, working in an unselfish and open spirit, that has at length made such Congresses possible, and, in fact, has brought them about.

The Royal Society was founded, we may remember, about the time of the death of Harvey, and in the near radiance of that Baconian light, of which the token was that it must be, not dry and barren, but fruitful and beneficent for the use of man's estate. And above me, in your view, is the bodily presentment of the greatest of the Society's Presidents—of Newton, from whose genius and character have radiated, for us and for all succeeding ages, the beams of a potent and almost divine influence.

Let me, for a passing moment, strike a chord that will wake an echo in every breast, and give expression to the trust, that in our deliberations we may be guided by the simplicity of his pure love of truth, and of truth only: as well as by its correlative, that modest self-estimate, that humility of mind, which in him was the mark of a deep consciousness of his own individual littleness, and almost helplessness, in presence of the dark problems of the unknown. "I know not what I may appear to the

world," he is reported to have said towards the close of his life, "but to myself I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble, or a prettier shell, than ordinary, whilst the great ocean of truth lay all undiscovered before me."

Let us now proceed to what lies more immediately to our hand. Those who have had the task of organising the arrangements for the present Congress, have been actuated chiefly by the desire that useful results should follow from it. With that view they have endeavoured to apportion the very short time at our disposal to the consideration of special subjects, carefully selected, such as seemed likely to be elucidated by the mutual exchange of thought between men of weight and experience coming together from distant places. They think themselves fortunate, in having, in so many instances, secured the co-operation of distinguished masters, who have, we have reason to believe, made special studies for their addresses, and whose words will be received, I am sure, with the respect to which they will be so well entitled.

In our own proper section of Ophthalmology, we shall have the advantage, on successive days, of directing our minds to the several important questions set down in our programme. The names of Horner, Snellen, Leber, Adolf Weber, and De Wecker, assure us that the materials for deliberation will be ample, and competently presented to us. There are also additional communications by able men, bearing on the same matters, and these will be read in juxtaposition, previous to opening the debates. The high reputation of so many of our members raises our expectations as to the results.

As it is very desirable that a good record of our discussions should be preserved in our transactions, it is earnestly hoped that every member who may favour us with his opinions should be as clear and as terse in the expression of them as may be; and should, at latest by the following morning, while the memory is still fresh, give a copy of his remarks in writing to the Secretaries. As to this, facilities will be afforded, and failing this, the Secretaries cannot be responsible for the publication, as we have no authorised reporters.

To-morrow the first of the distinguished men whom I have just now named, will place before us a subject of great interest and importance, the Antiseptic Method in Eye Surgery. I presume that no one nowadays will question the evils we are so familiar with in our practice, and which have so often marred the intention of well-devised operations skilfully performed; but where, as we hear it said, Nature has failed to do her part, to second the effort of the surgeon by a due process of repair, the study of the causes of such failures and of the means of obviating them, constitutes far the most brilliant page in the history of modern surgery; and in other sections of this Congress, while the name of Lister will be applauded, the wide questions he has raised, and in raising has so often cleared up, will receive the full consideration they call for.

In the case of the organ of sight, specially constituted, and in some respects screened from injury as it unquestionably is, there are reasons why the application of precautionary antiseptic measures, though the principle of them must still assert itself, should take a somewhat special form. Owing to the local structural conditions they may apparently be often more simple, though the possible need of the more elaborate of them should never be allowed to fall out of view.

The tears are a secretion as pure from extraneous particles as is the filtered air in the recesses of the lungs. They are poured out under cover, in the right place, in quantity suitable to the need; while the lids diffuse them over the conjunctival surface ere they escape by their proper channels. Their useful and multiple office is performed in a way so simple and so perfect, that no art, however skilful, could pretend to equal it. We should ponder well the deep marvels of adaptation of means to ends, and take heed that we do not hinder exquisite Nature by meddling or needless interference, by the *nimia diligentia Chirurgorum*, but only lend it tender and judicious help by our dressings and our methods. We should always still be able to apply the words of our great poet, "The art itself is nature." Three papers, by Dr. Reymond, of Turin, Professor Leber, of Göttingen, and Dr. Emmert, of Berne, relating to this same subject, of antiseptic surgery, will be read before the discussion is proceeded with.

On Friday we propose to treat in our Section the deeply interesting, and I must add, the very sad subject of Sympathetic Ophthalmitis, under the able guidance of Professor Snellen. This in all its aspects and stages is an affection peculiarly calculated to arrest attention. Though it has been extensively and very accurately studied, it yet remains very obscure. Even its anatomical conditions cannot be said to be fully explored; why it should occur is little understood. The explanation of the very remarkable phenomena manifested lies hidden for the present in unknown anatomical and physiological relations, and

it is to experiments on the lower animals that we may look with most probability for a clue to the enigma. Humanity will have reason to rejoice when this too-frequent cause of total blindness shall yield to a clearer insight into its nature, and to the consequent hoped-for discovery of the means of prevention or cure; for at present it brings life-long misery to many homes. Meanwhile experience suggests some general rules which may do something to ward off this terrible malady, or help us, in some instances, to control it, even now and then to check its progress temporarily, and, perhaps, permanently. The difficulty lies in the application of such rules, and to this point our discussions may, I think, very usefully be directed. An important paper by Dr. Brailey, on "Pathological Changes in Sympathetic Ophthalmitis," and another by Dr. Poncet, of Cluny, on the "Histological Examination of an Eye Enucleated after Enervation," will be read in this connection.

On Saturday, the main topic for us will be introduced by Professor Leber. It is one of a class which has recently been shown to have much wider relations than could have been imagined possible some few years ago, and which is certainly destined to attract more and more attention, not only from ourselves, but practitioners at large. The immortal invention of Helmholtz, by opening to the view of all instructed men the marvellous background of the transparent chambers of the eye, has gradually awakened inquiries on the part, first of oculists, and then of physicians, which even in their infancy have yielded results of rare and unexpected value. The changes visible by the Ophthalmoscope will naturally be noted down, and their varieties and sequences determined, before the precise interpretation of them by exact structural examination, and their true pathological import, can be ascertained.

These only admit of being worked out slowly, as opportunities, often rare, give occasion. Our knowledge of the relation of those aspects of the fundus of the eyes to what is concurrently going on in the optic avenues, and in the several associated portions of the wondrously complex double brain and spine, must in a great measure lag behind. And we must be careful not to leave for a single moment the safe ground of exact observation; or suffer ourselves to be beguiled by the wish to make the new knowledge fit into the old, till all seems a delightfully complete system. Such vain imaginations are not in the true spirit of science. Nevertheless, some broad and general facts already reward the clinical industry and acumen of several physicians, whose names are a sufficient pledge of the reliable character of their results. But I believe those who know the most, will be the most ready to confess, how rudimentary, at present, is our insight into this very important field of inquiry. Indeed, the study of the brain function (employing that term in its widest sense), and of the aberrations occurring in it that we call disease, remains still in its very infancy. It advances, however, with rapid strides, by the several parallel roads of human and comparative anatomy, experimental physiology and pathology, and of clinical observation, including morbid anatomy; and it cannot be long ere splendid conquests must be won for us in regions which have been so long shrouded in darkness, and so dense, that in our ignorance we have been hardly aware of their gloom. In connection with this discussion a comprehensive paper by Dr. Bouchut will be laid before you.

Glaucoma, the other great subject to be brought before us, is of even more practical importance than sympathetic ophthalmitis, because of its far wider prevalence, and its equally fatal consequences to sight when uncontrolled. We shall consider it in two aspects. On Monday, on the initiative of Dr. Adolf Weber, and after hearing papers by Professor Laqueur of Strasbourg, by Mr. Priestley Smith of Birmingham, and by Dr. Angelucci of Rome, all bearing on the anatomical and pathological basis of the subject, we shall discuss its nature and etiology: while on Tuesday the grand problem of its treatment, and chiefly its operative treatment, will undergo critical examination at the hands of one fully entitled to carry great weight with all of us, Dr. de Wecker, whose experience is very extensive. His address will be followed, before the discussion, by communications from Mr. Bader and Dr. Abadie.

It was Albrecht von Graefe, as you well know, gentlemen—that bright spirit, whose too early death we have not yet ceased to mourn, for ourselves and for science—who, at the same moment that he announced to the world the discovery of a remedy for glaucoma, also drew for us, for the first time, the grand outlines of the clinical history of the disease. His treatise will endure as the model work of a most fertile genius. In it he laid down the chief subdivisions of the subject, and how far his remedy was likely to be applicable in each. This single paper constituted an epoch in our department of the medical art. It was read, but hardly discussed, at Brussels, at the Second International Congress of Ophthalmology, in September 1857. Several of those now present were there. The impression produced among them was pro-

found. But yet we are still, twenty-four years later, anxiously inquiring what is the essential nature of the glaucomatous process; and what is the best remedy to employ?

It is, indeed, quite true that, since that time, our clinical knowledge of glaucoma has been greatly extended, and its varieties and complications recorded with some approach to completeness. Extensive researches, anatomical, experimental and other, have also been undertaken to account for the remarkable train of phenomena we observe. Attempts have also been repeatedly made to explain the *modus operandi* of Von Graefe's celebrated remedy; but as yet, it must be allowed, without entire success. The treatment by iridectomy, too, has been largely tried, sometimes with modifications; and, on the whole, it has been admitted to be the best and most reliable. The time, the method, the conditions of applying it to the varieties of eye-tension, have been in many particulars, though not with universal concurrence, defined and accepted. But, as was perhaps inevitable, men asking themselves always *how* iridectomy arrested the glaucomatous process, were now and then led to desire and to propose, and then to inculcate, other methods, having the same end in view, proceeding too often on some fancy or speculation, the validity of which experience has not sustained. Some of these methods, after obtaining a certain currency, have fallen into merited disfavour, while others remain more or less worthy of discussion, some perhaps of general adoption, under limitations to be yet laid down.

It would be quite foreign to my present purpose to pass any opinion on particular modes of operating. We hope on Monday to hear the great problem—the pathology of glaucoma—well handled by our distinguished colleague from Darmstadt; and on Tuesday to learn, and debate upon, the latest conclusions on its surgical treatment, announced by our eminent *confrère* from Paris.

Many contributions are furnished on other subjects than those to which I have hitherto adverted; and some of them bear upon a question of great and permanent importance, to which I would now ask your attention for a few moments.

The precision of our modern methods of determining the accuracy of sight, and of the sense of colour, has at length made it possible to urge with increasing earnestness, on authorities responsible for the lives of travellers, whether by land or sea, the necessity of enforcing adequate test-examinations, not only on candidates before engagement, but subsequently, at stated intervals, on all persons employed, where good sight is an essential qualification.

If this be important in regard to railway drivers, guards, and signalmen, it is even far more so in the maritime service. On land, each government is in a very direct manner held responsible to its own citizens; and accordingly, much has been done of late years in several countries—though effectually, I fear, in very few—to institute strict periodical examinations under State authorisation and control. As to these, perhaps, a very close uniformity through different countries is not so very necessary, however desirable. But it is matter of common and urgent concern to all nations that, on the open seas, on coasts, and in harbours, a uniform system should prevail as to the due, and sufficient, and periodical testing of the sight of those who may be in the position either to give or to observe signals, on the prompt discrimination of which a multitude of precious lives may at any moment depend. And I trust it may not be very long ere such a uniform system of tests as science can now supply, and also the obligation to put them in force among their own subjects, will be willingly accepted by all civilised States. The present seems a favourable opportunity for coming to some conclusions, and for laying down some definite rules, which, by their clear and practical character, may be likely to meet with general acceptance, and for pressing these with some urgency on Governments throughout the world. It is for your consideration, gentlemen, whether a committee of this section, the composition of which might be international, may not with advantage be appointed to deliberate on this grave subject, and to report to us before the Congress closes. I entertain the confident hope that any recommendations emanating from such a source—bearing, as they would probably do, the impress of moderation and good sense, as well as of exact knowledge of the subject-matter—would everywhere meet with the most favourable attention of statesmen, and be admitted by them as carrying great weight. I would suggest such a committee, with Professor Donders as chairman, if he would be so good as to undertake that office.

Gentlemen,—We anticipate hard work within the narrow limits of our sittings. I trust we shall be able to assemble punctually, so as not to waste moments which can never be recalled.

One more remark: There will be, I fear, the unavoidable difficulty and source of confusion in our converse, arising through the want, in some of us, of familiar acquaintance with one or more of the languages in which others are giving expression to their views. It is but too cer-

tain that we have not yet a common tongue, however probable it may be that mankind are tending in that direction. Misapprehension of each others' meaning is not unlikely to occur; and, at any rate, both the expression and the recognition of ideas will be impeded. To lessen, as far as possible, this drawback, great pains have been taken to prepare, in the three official languages of the Congress, a suitable abstract of every paper; and to place these abstracts in the hands of every member who may wish to acquaint himself beforehand with the authors' propositions. Besides the volume of abstracts, comprising those of all the sections, a few separate copies of those proper to our own, will be in our meeting-room, for the use of those who may not happen to have the volume at hand. These copies remain in the room.

The Executive of the Section have reason to thank the authors for the promptitude with which in most cases the abstracts have been furnished to our indefatigable and able secretaries, who have been at the pains of collating them. If any faults of translation or of printing should be discovered, they will doubtless be attributable to the pressure under which the laborious task has had to be accomplished.

And now, my dear friends and colleagues, let me say that if some difficulties of the kind just mentioned await many or most of you, how much must you find them enhanced by the circumstance, unfortunate for himself also, that your president is to a great extent ignorant of the languages, French or German, in which many of the most valuable communications will be addressed to you, and the speeches delivered. All my life long I have regretted the slightness of my acquaintance with those foreign tongues, which in the past, as in the present, have been and are the channels by which priceless discoveries have been announced to the world, as well, perhaps, as the media of keen, even burning controversies, when men encounter each other in their search after truth. Thus, and from other causes appreciable enough to most of us as life advances, we are apt to fall relatively into the background, and to have to rest content in finding our pleasure rather in learning at second-hand, and after some interval of time, what others have been happily accomplishing, than in hoping to establish for ourselves, or to maintain a forward place. But never till the present moment have I had so much cause to lament my many deficiencies, since now they must of necessity affect others even more than myself. I rely, however, with full confidence on your kindness and indulgence, otherwise I could never at all have ventured to undertake the honourable office of being your president at this great Congress.

AN ADDRESS ON THE RELATIONS OF MINUTE ORGANISMS TO CERTAIN SPECIFIC DISEASES.

Delivered in the Section of Pathology.

BY E. KLEBS, M.D.,
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ARE there specific organised causes of disease? This question, which during the last twenty years has agitated the medical world, and the decision of which, by anatomical and experimental methods, appears now to be near at hand, I will here attempt to answer. A short exposition of the facts of the case will show that, in consequence of the acceptance of this hypothesis, our science will have to undergo a profound transformation.

One circumstance which speaks in favour of the assumption of such a theory of disease—an assumption deeply based in the human intelligence—is that forms of disease, very different from one another, but which at the same time remain uniform in each particular case, and especially those which have always been characterised as communicable, have been from the earliest times ascribed to causes entirely foreign to the normal life of the organism. I would remind you of the arrows of Apollo, which, as the Homeric Greeks thought, brought death into their ranks; and of the wrath of Jehovah, which, according to the Old Testament, produced destructive pestilences. In the middle ages the same view took a form which was coarser, but at the same time more tangible; for the new pestilences which appeared in those times were ascribed to fabulous animals, to winged worms, little dragons, and spiders, which were believed to attack mankind. Here we see foreshadowed in the popular language, though perhaps unconsciously, in a manner accordant with our present views, the second element of the problem, viz., the organised nature of the elements producing disease.

Few physicians, indeed, supposed the causes of disease to be of this material kind; but Van Helmont, for instance, was one who did so.

It was reserved for modern times to give a more definite form to this hypothesis, and it is, probably, to Johann Lucas Schönlein, that the highest credit is to be ascribed. He took his stand upon the ground of natural science, and led on by the researches of Bassi and Audouin, upon the nature of muscardine disease, became the discoverer of the *favus-fungus*, known by his name. Although the way was thus opened up for the further establishment of this hypothesis respecting the nature of morbid processes, the development which it first underwent, through the labours of Henle was purely theoretical; for a strict anatomical demonstration was still impossible, in consequence of the imperfection of the methods then in use.

Just as pathological anatomy since Vesalius and Morgagni has supplied the solid basis on which modern medicine rests, it has been the task of microscopical pathological anatomy to lay the foundations of its latest development; by demonstrating in many diseases, the presence of organised foreign bodies in the pathologically altered organs.

The material changes of the organism, whether of tissues or organs, cannot, it is easy to see, be regarded as the adequate cause of any disease introduced into the body from without. Just as little are any general variations in external conditions of life sufficient to explain the various forms of infective disease. On the other hand, the demonstration in diseased parts of organised foreign bodies capable of multiplication fulfils the conditions of the philosophical postulate, which was framed by the untaught logic of the people, and by the profounder conceptions of men of genius.

If we now consider the present state of this question, the three following points of view present themselves as those from which the subject may be regarded.

I. We have to inquire whether the lower organisms, which are found in the diseased body, may arise there spontaneously; or whether even they may be regarded as regular constituents of the body.

II. The morphological relations of these organisms have to be investigated, and their specific nature in the different morbid processes has to be determined.

III. We have to inquire into their biological relations, their development inside and outside the body, and the conditions under which they are able to penetrate into the body, and there to set up disease.

I. The question of the spontaneous generation of organisms is one of such universal significance, that it cannot be investigated solely in relation to pathological states.

It is necessary, in the first place, to decide the previous question: whether, supposing that the possibility of spontaneous generation were proved, this process could have any importance in setting up morbid processes. This previous question, must, however, with our present knowledge of these processes, be decidedly answered with "No"; for the communication of infective diseases by transference of material particles from without, can no longer be regarded as open to question; though in the middle ages, for instance, such a doubt did exist with regard to syphilis. Just as little can organisms of this kind, which indisputably do occur as regular and permanent inhabitants of some organs of the normal body, be regarded as the cause of such morbid processes as are conveyed from man to man, or are introduced into our bodies by means of air, water, or food.

In regard to this point one possibility only must be conceded; namely, that such normal inhabitants of the human body may by alteration of the medium in which they occur, acquire virulent properties, and so become causes of disease. It is however, equally clear that it would not be possible for any and every form of disease indifferently to be produced in this way; even supposing, for instance, that the specific elements producing disease were present in a latent inactive form in any part of the body, such as the intestine. Cholera may rise in consequence of chill or fright, but only at the time of a cholera epidemic.

Although this view must appear clearly established to every thoughtful physician, it is still a hypothetical induction, deduced from general facts. Hence arises the necessity for a further presentation of the relation between the morbid cause and the morbid state, and a presentation, if possible, which appeals to the senses. Hence, too, the necessity of a morphological and biological investigation of the subject.

II. If we start from the principle that specific diseases can only be produced by specific organisms, the question arises whether such specific differences of a morphological kind can be demonstrated in those organisms which are constantly found in diseased organs. Since it is quite possible that the specific character of the action of these bodies depends upon minute chemical differences, it could not be taken for granted beforehand that morphological differences would be discovered in these specific disease-producing elements. Fortunately, however, the uni-