conditions they may arise, suggest that, as every branch of biological science is being studied in relation to the lower organisations, and according to the law of evolution, so must pathology become the subject of a large field of inquiry, and be made to embrace the diseases of all animal and vegetable life. The comparison of disease in man and animals may throw much light upon its nature; and it is remarkable that so few persons have been stimulated to the work, by considering the long controversy which has taken place as to the relation between vaccinia and variola, or hydrophobia and rabies. A true human pathology should have its basis in comparative pathology. Here lies a mine of wealth but little worked. As at the present time every structure and function of the human body is being studied in reference to its antecedents in the lower animals, so there can be no doubt that the various morbid changes to which it is liable may be also profitably discussed in reference to similar actions in more simple forms of life. The truth of this has been clearly seen by philosophers who have had no special acquaintance with our department of science. Thus Buckle, in his *History of Civilisation in England*, says: "The best physiologists distinctly recognise that the basis of their science must include not only the animals below man, but also the entire vegetable kingdom; and that, without this commanding survey of the whole realm of organic nature, we cannot possibly understand even human physiology, still less general physiology. The pathologists, on the other hand, are so much in arrear, that the diseases of the lower animals rarely form parts of their plan, while the diseases of plants are almost entirely neglected, although it is certain that until all these have been studied, and some steps taken to generalise them, every pathological condition will be eminently empirical, on account of the narrowness of the field from which it is collected." This is almost as true now as when written several years ago; but we are pleased to think that our countryman, Sir James Paget, has already removed this slur upon our scientific procedure by his lecture on "Elemental Pathology", in which he shows the importance of observing the resemblances between the changes in the various tissues of man and the vegetable world, and also the deductions to be drawn therefrom.

Again, if the specific diseases be due to organisms, and the hypothetical *contagium vivum* be a reality, it must be subject to the same laws as other organic matter; and, if the doctrine of evolution be true, it must have numerous relations with families of its own kind, and perhaps with others which are now obsolete. This idea has occupied the minds of several medical men in this country, and it will no doubt further fructify in their hands (Dr. Airy, Dr. Thorne, etc.).

A highly contagious disease prevailing in a particular locality may be exhibiting the differentiation of some more simple, less virulent, and widely spread disorder. For example, a slightly contagious epidemic sore-throat might, in course of time, develop into a more virulent one, until it culminated in diphtheria; and, if this disease be due to an organism, the latter might have found a more genial soil for its development, or be altered by propagation and time, so that new properties might at last have been added to it. There may be a progressive development of infectiveness. Then, again, the doctrine of natural selection might obtain in the fact of some specific diseases remaining amongst us, while others have become obsolete. The same law, too, if allowed its full operation, might tend still more than it does to the subjugation of many hereditary diseases; for, as these appear in youth, and often cause death, they would fade away by a process of self-destruction. As regards the specific diseases, we see again how the most susceptible persons would be struck out by the poison, and the least susceptible remain, so that the poison would be modified in its virulence. We witness this fact in the more moderate characters of the exanthemata in all civilised nations, in comparison with the more profound effects produced by them in nations where the diseases had been hitherto unknown, as, for example, the fatality in the Pacific Islands of our comparatively mild British measles.

Besides the maladies which are induced by the evil influences of our ordinary surroundings, and those due to specific causes just named, there is a class of diseases styled new growths which take a very large share in adding to man's mortality. The advance made in our knowledge of these structures is very considerable, and is still rapidly progressing towards a determination of their origin and the discovery of their relation to the normal tissues. These investigations are assisting us in discarding some of our older notions regarding their constitutional and malignant nature, and proving that many are accidental in their origin, and therefore may possibly be averted.

In these brief remarks, we see how the simple definition of pathology as a deviation from the healthy standard fails in its application, and how wide is the range of subjects included in its domain. What these are, you, gentlemen, are about to illustrate in the different subjects which you will bring before the Section.

AN ADDRESS

DELIVERED AT THE OPENING OF

THE SECTION OF MEDICINE.

By SIR WILLIAM GULL, Bart., M.D., D.C.L., LL.D., F.R.S.,

Consulting Surgeon to Guy's Hospital, President of the Section.

GENTLEMEN, Friends, and Colleagues,—I am deeply sensible of the honour conferred upon me in being called upon to preside over this Section, and I offer you my cordial thanks.

Happily the duties will not be arduous, since the general addresses which have been arranged and admirably allotted, relieve me of the responsibility of attempting to develop before you the actual position of medicine, or the probable lines of its future progress.

As the International Medical Congress assembles in England for the first time, under the auspices of Queen Victoria, so I am reminded that three hundred years ago, under Queen Elizabeth, Bacon enunciated for the first time, in the simplest terms, the position of the student of nature in relation to the work before him.

Prone as we mostly are to easy satisfaction on imperfect evidence, and to rest in the *experientia fallax*, it is something that we are all agreed, in aim and means, and admit that there is but one source and test of knowledge, "the observation of the order of Nature". We have no principles, but facts; no eclecticism, but of these; and nothing touching the conditions of humanity is foreign to our consideration.

Anatomy, physiology, and pathology, have an impersonal and scientific object. Their aim is wide and general. The facts with which they deal are subject to no deflection from affection. Great or small, they have all an equal value. Pathology even denies its name in the presence of that which is universal, merges into physiology, and sees that "whatever is, is right". But far otherwise is it with clinical medicine, where the welfare of the individual alone has to be considered. We call ourselves physicians, and cannot be too jealous of the title and of all that it includes; but we are *Medici*, or curers of disease. Hence, together with the highest duties which science imposes, there are the various personal claims of humanity, augmented by suffering and charged with every disturbing element that weighs upon the heart of man; but at the same time, for us, with every high and quickening motive. These are warping influences, and to correct them we have often with effort to bring our clinical questions into relation with that which is impersonal and above passion.

It is an agreeable fancy on these occasions to suppose that civilisation may have been differentiated into its various nationalities, less for the strife of war, than that each nation might contribute, according to its genius, to the progress of the sciences. It may be Utopian to see it thus. Yet a review of the past two or three centuries would suggest as much. That scientific congresses have met, and that they continue to meet, promise better things to come out of the social chaos; as the imagination realises organisation springing up amidst the strife of the elements in an early world.

To Italy and the South we owe the early development of anatomy. The illustrious names of Morgagni, Galvani, Scarpa, and others, many of whom have left their names for ever inscribed on our textures, bear early and continued witness of this. And although we Englishmen will ever be tenacious of vindicating for our Harvey the immortal honour of having first demonstrated the circulation of the blood, we equally admit that Italy was his teacher of anatomy. And no less did Italy lead the way in morbid anatomy, as testify the pages of Morgagni, in his treatise *De Causis et Sedibus Morborum*.

To Germany and the North we are largely indebted for analytical progress. Their profound investigations in chemistry, and their exhaustive researches into minute anatomy and histology, have gone far to solve the problems of organic composition and organic structure. I will not support my position by citing illustrious names. Happily, many whom I should have to mention are still among us; but biological science will never forget Leeuwenhoek and Ehrenberg, or Berzelius and Liebig, nor the labours of the modern schools.

France, with her rare synthetic faculty, seems specially gifted for promoting the science of physiology: I have but to recall the name of Bichat, and to point to the refined investigations of Bernard, and to those of his successors of to-day. And with France I may join Switzerland, whose Haller gave the earliest and strongest impulse to the study of the laws of living things, as a separate science; though, as in the

case of Harvey, his lamp was lighted abroad, in the famous school of Leyden.

The English genius is perhaps more fitted for the historical method, and its obvious lessons. But perhaps I ought not to say obvious, for not rarely the English have been satisfied with records without inferences. There are, however, splendid instances of both; of the one in the museum of Hunter, and of the other in the works of Darwin.

But here you will be ready to exclaim "Siste!" for who in the least acquainted with the progress of the biological sciences in different schools at the present time would venture to claim for either some special fitness over the rest for any line of pursuit, and when the spirit of each can say, like Goethe's *Natur-Geist*:—

"In Lebensfluthen, im Thatensturm
Wall ich auf und ab
Wehe hin und her!"

Some have prophesied that the advancement of the biological sciences will leave medicine a barren waste in their midst; but such a result, in the natural course of things, cannot happen. There is an indissoluble union between all the sciences, which for medicine especially, human interest will ever strengthen. The past history, and the present state of our profession, give us abundant assurance of this. It is not too much to assert that the study of medicine will for all time attract a large proportion of the best thinkers and workers of the world. It has ever been so; and what has been, doubtless shall be in the time to come. Besides, almost every germ of scientific thought has sprung in some way from medicine; and I have only to remind you that some of the most illustrious physiologists and pathologists of to-day, are members of our own profession. And if from the delicacy, intricacy, and the demands made upon all the powers of the intellect by the extent and character of their investigations, they have as it were turned aside from immediate clinical work, they are still so much in union with us, that we daily at the bedside avail ourselves of the results of their labours, and gratefully acknowledge that they are our ministering angels, ascending and descending upon the ladder of science in the furtherance of all good practice.

Clinical medicine, however, of itself, affords opportunities for the study of pathology, which are in some respects at least unique. Through it, and through it alone, we become acquainted with the first deviations from normal function. From such early beginnings we may trace the development of pathological processes, until the organism is finally, and in different ways, overwhelmed by them. I need only suggest those chronic lesions which spring up from conditions *ab intra*. In the latter stages of these degenerative processes, we are apt, without their history, to be so impressed with the more prominent mechanical results, that these would seem to us the original and essential conditions; as, to the Nile-worshipper, the River is a power in itself.

It is well for the progress of clinical medicine that its lines of investigation are thus intimately interwoven with the more scientific departments. It saves us from the dangers of Separatism, and our colleagues from those of Pharisaism; and it quickens our observations where they might otherwise be thought insignificant. If we cannot weigh and measure the data before us, we may still advance the solution of some of the more difficult problems of our condition by critical and exact records. How much has been done in this field of late, especially in cerebral physiology, need not now be told. Every fact to the clinical physician has its value, though it may be of a different order to the phenomena of gravitation. A tone of the voice, the play of the features, the outline and carriage of the body, are to him as invariably related to the central conditions which they reveal, as are the grosser facts of nature.

The work of the next few days, so far as it is foreshadowed by the list of promised papers, will raise some important pathological questions. You will be asked to consider peripheral lesions, having their origin in nerve-centres—lesions which have for the most part been hitherto chiefly considered primarily humoral and chemical, but now referred to "trophic changes of nerve-origin".

On this point, it may be not uninteresting to notice how "solidism" is widely reasserting itself in the science of living things; not as an *à priori* system, but through the progress of knowledge. The proximate conditions of pyrexia are no longer vaguely referred to nerve, but to definite nerve-centres; hyperæmia and inflammatory changes to sympathetic lesions; abnormal chemistry to the great respiratory centres; the strange conditions of Addison's disease, with its characteristic pigment, to the suprarenal bodies, themselves probably but nerve-centres, and related, at least by structure, to the system of the pituitary gland; epilepsy, supposed in Hippocratic times to be due to extraneous maleficent spiritual influences, is traceable to apparently trifling changes in a few grey nerve-cells. The specific fever-processes notoriously owe much of their character and intensity to the nervous system. Their

relation to time, their occurrence only in warm-blooded animals, the great mortality they cause through nerve-exhaustion, and the immunity they leave behind them, indicate that, whatever may be the nature or mode of operation of their several poisons, it is by implication of nerve-elements that fever obtains its chief clinical characteristics.

Further, in the advance of "solidism", what can interest us more than the recent investigations on contagia? Perhaps no more important step has been made in practical pathology than the proof that some at least of these contagia are organised solids. This discovery, which it has tried the patience, experimental skill, and scientific criticism of the best observers to establish, has brought us at length within view of that which has hitherto been so mysterious. To have been able to separate, though imperfectly, the contagious particles; to have come to the conclusion that no fever-poisons are soluble—is a hopeful preliminary towards forcing them to yield up the secret of their nature.

If "solidism", as a theory of organic processes, wanted confirmation, we could point to nothing more striking than the present established views on putrefactive changes, and to the amazing fact that the normal textures and fluids of the body resist decomposition unless invaded by microscopic organisms.

May we not hereafter find that all organic chemistry is the resultant of mechanical changes in organic solids?—all Nature, in fact, as Newton asserted, mechanical, but the Great First Cause? Of this we are admonished on all sides. Histology, physiology, pathology, clinical medicine, teach us more and more the supreme importance of *form* and *relation*.

Lesions extending from alteration of the blood-vessels will also come under consideration. Of course the more common facts relating to aneurysm and valvular disease, or such as are thrombotic or embolic, need not be discussed; but there is a contribution which raises the question how far primary, general, arterial tension may be a starting-point at least in renal pathology.

The etiology of typhoid fever will be raised at one of our meetings. This cannot but enforce a rigid criticism of the infective processes, and of the differences between the states of simple pyrexia, septicæmia, and the specific fevers.

The pathology and treatment of gout, rheumatoid arthritis, and rheumatism, to which, in one form or another, the English seem rather especially prone, will also come up for discussion. Whether they have humoral sources has of late become more and more doubtful.

Of the pathology of acute rheumatism, we may be said to know but little beyond its clinical records and its symptoms; but, unhappily, this has not always been sufficiently recognised, and too often a dangerous polypharmacy has rushed in to the cure where science has not yet advanced her foot.

The forms of renal diseases, for a long time included, with little exception, under the term "Bright's disease", will undergo a further degree of analysis. It was a happy omen of this when they moved from the singular into the plural form, "Bright's diseases"; and we may hope now for a more methodical subdivision of them, making their clinical recognition more easy, and their therapeutics more precise.

In the matter of diagnosis, we have invited contributions on the pathognomonic and diagnostic value of the localisation of disease in the brain and spinal cord, which will be an occasion for a review of our knowledge of cerebral and spinal mechanism, and for further elucidating the pathology of the different conditions of blood, blood-vessels, and connective tissue concerned in the nutrition and diseases of these great nerve-centres. Brain-texture proper seems but little liable to primary disease. As the nervous lamina takes the lead in embryonic evolution, so it would seem that its equivalents in the adult maintain a degree of resistance to morbid change throughout life.

Time fails me to speak of all that we hope to undertake. Any one paragraph of our programme would more than consume the time at our disposal. It must not, therefore, be inferred that the importance attached to any one of the subjects is in proportion to the prominence given to it in this hasty review. The treatment of disease, for instance, is a subject too large and weighty to speak of in general terms. In some minor points it will come before us, as in a paper on the advantage of high altitudes in the treatment of pulmonary phthisis.

An organisation such as our own, which it has taken countless ages to evolve, must reasonably require incalculable time for its scientific analysis; and the same may be said of the infinite and varying conditions by which it is maintained, and upon which its existence constantly and immediately depends. As best we know but a few proximate facts, yet these in judicious hands have afforded a good harvest of practical results: what better fruit we may gather when science has penetrated deeper into the laws of our being, and all that affects it, it is impossible to forecast.

In the spirit of the exhortation given by the President in his address to-day, and in the slightly altered words of Bacon, with whom I began, let me conclude by saying: "It were a heaven upon earth, to have the mind illumined by knowledge, to move in charity, and turn upon the poles of truth."

AN ADDRESS

DELIVERED AT THE OPENING OF

THE SUBSECTION OF DISEASES OF THE THROAT.

By GEORGE JOHNSON, M.D., F.R.C.P., F.R.S.,

Professor of Clinical Medicine, and Senior Physician to King's College Hospital;
President of the Subsection.

GENTLEMEN,—The first duty that I have to perform is to express my high appreciation of the honour conferred upon me in the appointment to preside over this important subsection of medicine. I have next the pleasure to offer a hearty British welcome to the many very eminent laryngologists who, from various parts of the continents of Europe and America, have done us the favour and the honour to join this Congress, and to make, as they are about to do, numerous important and highly instructive communications to this department of medicine. The history of the laryngoscope has been often written, and is well known to this learned assembly. I am sure, however, that I shall have your sympathy and your approval in giving a brief expression of our indebtedness to Signor Garcia—whom we have the pleasure to welcome amongst us here to-day—for the pre-eminent share which he has had in the invention of that instrument. While all previous attempts to inspect the living larynx had been incomplete, and barren of further results. Signor Garcia, who has the unquestionable distinction of having been the first man whose thoughtful ingenuity enabled him to see his own larynx, published the results of his autoscopic observations in the *Proceedings of the Royal Society* (vol. vii, 1855), and this publication led on, through the appreciative mind of Professor Türck, and the indefatigable zeal and exertions of the late lamented Professor Czermak, to the creation and the rapid development of the art of laryngoscopy.

It is scarcely possible to overestimate the practical importance of this simple invention. I have been long enough in practice as a physician to have had ample experience of the enormous difficulties which often attended the diagnosis, and therefore the treatment of diseases of the throat in the dark prelaryngoscopic age. And now, by contrast, the result of the new light thrown upon this region by the throat-mirror has been that within the last twenty years our knowledge of laryngeal diseases, including accuracy of diagnosis, with certain and successful treatment, has made greater progress than that of any other department of medicine or surgery during the same period of time. In making this statement, I am not unmindful of the immense advance which has been made in the diagnosis and treatment of eye-diseases since the genius of Helmholtz conferred upon mankind the inestimable gift of the ophthalmoscope.

It is not without interest to compare the practical gains with regard to both diagnosis and treatment, which have been derived respectively from the two analogous instruments—the ophthalmoscope and the laryngoscope. In regard to facility and accuracy of diagnosis, the ophthalmic surgeon and the laryngologist may be considered to have been about equally benefited by the use of their respective instruments. If we take into account the numerous remote diseases, more especially those of the nervous system, upon which the ophthalmoscope has thrown a new light, that instrument may, perhaps, be considered, in the matter of mere diagnosis, to take precedence of the laryngoscope. With regard, however, to improved methods of treatment, and in particular to the introduction of entirely new and previously impossible mechanical operations, there can, I think, be no question that the laryngoscope has done more than can fairly be claimed for the ophthalmoscope. Without doubt the exact diagnosis of eye-diseases has led to improved and more successful treatment, but the ophthalmoscope has afforded no direct aid to treatment comparable, for example, with the safe and easy removal of morbid growths and foreign bodies, which the laryngoscope has made an every-day proceeding.

Amongst the most interesting and important of the scientific and practical gains which have resulted from the use of these two instruments—and which may be claimed alike, if not equally for both—is the fact that, by the inspection respectively of the interior of the eye and of the

larynx, valuable light is often thrown upon the diseases of remote but physiologically correlated organs. If, for example, the ophthalmoscopist sees in the eye a retinitis significant of renal disease, a neuritis indicating cerebral tumour, or an embolism the result of valvular disease of the heart, so in like manner the laryngologist is often led, by the observation of the paralytic or spasmodic condition of one or more laryngeal muscles, to the diagnosis of a general neurotic condition to which the term hysteria is often applied, or of a special local disease in the nervous centre, or, it may be, of a tumour, cervical or intra-thoracic, pressing on the pneumogastric nerve or its branches.

It is obvious that all clinical facts of this kind, indicating, as they do, the interdependence and the close physiological relationship between various tissues and organs, are of great scientific and practical importance. There is reason for the belief that, the more thorough and profound is the investigation of any disease or class of diseases, the more numerous and intimate will be found to be the relationship with other morbid states. The study of renal diseases affords abundant and most instructive illustrations of this proposition.

The more special, therefore, is any department of practice, the greater is the need to recur often to general principles, and to bear in mind that, so close is the solidarity of the animal organism, that there is a literal and physiological truth in the apostolic statement: "Whether one member suffer, all the members suffer with it." The ill-informed portion of the public are apt to look upon a man who has a reputation for skill in the treatment of a particular class of diseases, as of necessity unacquainted with all other diseases. We, on the other hand, maintain that, of the specialist, it should be said with truth that he is one, not who knows less of disease in general, but who knows more of the particular class of diseases to which he has devoted most time and especial attention and study.

The Hippocratic maxim "Life is short, and art is long", is as true now as it was two thousand years ago. Bearing this in mind, and knowing, as I do, how many valuable communications are in store for us, I will occupy no more of your time, but will at once call on the gentleman whose name stands first upon the list to read his promised paper.

AN ADDRESS

DELIVERED AT THE OPENING OF

THE SECTION OF SURGERY.

By JOHN ERIC ERICHSEN, F.R.S.,

Consulting Surgeon to University College Hospital; President of the Section.

GENTLEMEN,—Surgery is never stationary. To be stationary while all around is in movement would be practically to retrograde. But movement does not necessarily mean advance. The general direction of the movement may undoubtedly be forwards, but the factors of that movement do not all equally tend to progress. When the history of surgery comes to be written—and this has never yet been done—it will be found that the surgery of the nineteenth century has not been uniform in its progress in all departments; that its advance has not been continuously in one line, but that its progress has been materially affected by the prevailing bias of the professional mind of the day. Anatomical at one time, physiological at another, the tendency of the surgery of the present day is influenced in one direction by the mechanical spirit of the age, and in another by the advanced pathology which is one of its chief medical characteristics. Yet the continuous advance of our art is undoubted. The gain that thus results has been definitively secured to surgery and to mankind. It can never be lost. Every conquest that has been made has been permanent. Year after year some new position has been won, often, it is true, after a hot conflict of opinion; but once occupied it has never been abandoned. Thus our standpoint has ever been pushed on in advance. For knowledge in science is cumulative, and skill in art is a tradition that is hereditarily transmitted from master to pupil, if not by the individual, yet by the profession to which he belongs, from which he has acquired, and to which he bequeaths it, augmented and perfected by his own labours. With the knowledge of our predecessors we are familiar; to its stores each generation has added. What they have done has been transmitted to us, and we can readily accomplish. In what we can do, we may be sure our successors will not fail.

It is well that, from time to time, this advance should be measured, this gain weighed. The business of this Section is not only to measure the extent of the advance, but to determine the value of the gain; and