phates are largely given, and with great confidence in their good effects. Why? What is their mode of action? The phosphates came away rapidly from the broken-up tissues in certain diseases. I would repeat the question I have put with regard to iron—Can the passive crystalloid phosphate draw to itself the elements of the energetic colloid to replace the broken-up structures? Does the iron taken into the stomach diffuse itself passively through the tissues? In what way do antimony, arsenic, mercury, silver, and lead accumulate in the system? Do they diffuse themselves through the whole of the colloids? The action of the ergot of rye, of chloral, of quinine, of the bromide and iodide of potassium, of the potash salts, of the narcotics, and of many other drugs is as yet imperfectly ascertained. The influence of the cold bath, the wet sheet, the douche, wet sponging, and the local application of cold or heat on the temperature of the body calls for inquiry. The effects of certain kinds of food much employed in the sick-room are not yet known. What is the effect on the frame of Liebig's essence of meat, which contains no protein element—not even albumen—which contains little besides the fragrance of meat, and nitrogenous compounds. The same question, a little modified, applies to beef-tea and chicken-broth. Is it right to give those liquids, charged as they are with nitrogenous compounds, to patients affected with Bright's disease, whose blood is already poisonously saturated with broken-up nitrogenous compounds?

These important practical questions call for careful, patient, and unbiassed investigation. That investigation cannot be carried out without the aid of extensive self-recording instruments, accurate chemical apparatus, and other appliances.

Our Association has hitherto been unable to devote any portion of its income to the awarding of grants to aid in the investigation of disease and its treatment, but it is to be hoped that the time is rapidly approaching when it will have such means at its command, and that it will soon distribute grants of money to individual workers, or to committees to enable them to investigate disease.

There are many young physicians with time at their command and an earnest desire and skilled power to pursue important investigations of the class to which I have briefly alluded. They are attached to the various hospitals and medical schools that are doing so much good in the great centres of population in the three kingdoms. The recent establishment of classes of practical physiology has familiarised them with the true method of inquiry. If our Association places at their command the instruments and means of research, their vigorous powers of investigation will bring to light many of those important questions as to the nature and treatment of disease that are as yet comparatively obscure, and thus the science of medicine will be enlarged and elevated by labours inspired by this Association.

AN ADDRESS

DELIVERED AT THE OPENING OF

THE SECTION OF SURGERY,

At the Annual Meeting of the British Medical Association,
in London, August, 1873.

By JOHN HILTON, Esq. F.R.S.

It must be a real gratification to any surgeon that he should be appointed by what I may fairly call the suffrages of a large section of his profession, and those the most active in the cultivation of professional knowledge, to occupy the position which I have now the honour to hold; therefore my first duty is to respectfully acknowledge and to express my personal appreciation of this distinction; and, further, to thank the members of the Society, who, through the Committee, have conferred this dignity upon me.

So much has been written and spoken on the progress of Surgery, that I dare not occupy your time beyond a very brief allusion to my individual experience of its advancement, lest I should trench upon the ground which the learned professor, who will address you at greater length, will necessarily occupy.

There has been much controversy in reference to the significant terms Art and Science, as applied to our professional progress; much earnest and thoughtful disputation has been employed in order to place medicine exclusively under the one or the other; and some writers have expressed their relation to each other, as a necessary sequence from art to science. These differences of opinion have arisen chiefly from a desire to fix the term science upon the details of what cannot be defined in exact terms. But I would ask you to go back with me just three hundred years, in order to observe how Bacon treated this same

point. He puts the question, as it existed in his days, at rest, by the obvious and simple differential arrangement between *method* and *knowledge*, in which definition the real features of the above problem will be found. Using the concrete language of his day, and at the same time revealing his great reflective power and his wonderful prescience, on the subject of the progress of knowledge he wrote these words: "Our early knowledge was *ciphers*, *alphabets*, it may be *words*; but by degrees it has grown into *wheel ciphers*, *key ciphers*, *doubles*, etc." This order or gradation of progress strictly applies to surgery, as far as my own recollection and interpretation serve me.

In my present position, the mind naturally reverts to what surgery was in the early period of its cultivation by myself and by my then colleagues, and what it is now, under a higher form of culture. At the outset of my career, *anatomy* was the *alphabet* upon which surgery took its stand. An accurate anatomy was the start-point from which it was to attain to the hopeful position of a science, or rather "method". Physiology was at that period a series of words, or, as Bacon would have styled them, intermixtures of "nulls and non-significants"; but I have been allowed to watch its growth into what he designated *wheel ciphers*, *key ciphers*, and culminate in a process which he called "involution or infolding"; just as we, in our progressive horticulture, have converted the stamina and calyx of the plant into corolla, and thus promoted the infolding to form the perfect rose.

So in Surgery, under my individual observation. When I commenced the study of my profession, the method of *tradition* was the all in all; the premises for reasoning were scanty and ill understood; but the alphabet, anatomy, was more diligently cultivated than at any former period. Physiology also within my own recollection began to be earnestly studied by our German professional brethren and ourselves; so that, with a more accurate anatomy and a higher physiological knowledge, a more firm basis was created for our clinical observation, resting upon John Hunter's researches, to secure a safe departure into rational surgery.

Thus were we led on by a more accurate anatomy, a more closely applied physiology, and a more definite clinical observation, of how tissues behave under the manifold forms of disease with which the surgeon has to deal; and thus the judgment of the surgeon outstripped the syllogism of tradition, and acquired the more definite form of an inductive attempt to explain, in good faith to himself, the marvellous phenomena which he was daily witnessing.

Therefore, I think it may be legitimately contended, first, that, although Surgery may not be strictly a science capable of mathematical proof, yet that it has not lagged behind the other branches of knowledge which have advanced so rapidly within our generation; and second, that a more accurate anatomy, a more recondite physiology, and a more painstaking observation of morbid phenomena, have kept it up to the level of those other branches of mental cultivation, which cannot yet be expressed in aphorisms, or demonstrated by exact proofs.

Again, great aid to its advancement has been derived from discussion in our numerous societies, which have constituted a peculiar feature of our progress in the present generation, both scientifically and socially. Hence I desire especially to dwell for a moment on the advantages of this great Association, representing, as it does, a professional community free from professional polemics; connecting professional strength; sustaining good professional feeling; dispelling jealous egotism; promoting the growth of mutually kind consideration one towards the other; and a genuine liberal appreciation of each other's legitimate work; thus creating a rich fund of knowledge, common to all.

The non-medical public, of course, chiefly recognise our divergencies (sometimes prominently presented to them), just as they do in the instances of theologians or of distinguished lawyers; and, arguing from our differences, infer, *more suo*, that as all cannot be right all may be wrong. But as they come to learn, through societies such as this, the real spirit in which we can work together for the elaboration of science, as it bears on our vocation; the kindly spirit in which we can discuss our difficulties, and the friendly way in which we labour, not for our own ends (at least not in this society) but for the public good; whether it be in the cause of sanitary improvements or by delving into the deeper recesses of our art, where we are met by that stone wall, biological knowledge; they will learn by degrees to judge us, not as they now do by the mere results of success or failure, but by the rational standard of a fair estimate of the sincere efforts which we have made, whatever may be the results.

Surely the free discussion which we employ, in order to arrive at the transcendental phenomena associated with life and disease, in order to fairly interpret the deviation of the latter from the paths of health, under the form of what we call disease, is one of the highest intellectual labours in which the mind of man can be engaged; and in proportion

to our own steadfastness in its pursuit, the public will gradually learn to estimate our honest toil.

By discussion the rule of custom or authority is swayed and broken, and the primary conditions of intellectual ongoing are set free. Discussion, indeed, furnishes the great incentive to vigorous and elevated thought, and is a motive power of incalculable impulse to the advance of learning in any form; but most particularly so in that form, in the cultivation of which we spend our days, and I may fairly say our nights.

Discussion necessarily implies *in limine* that its subject is a matter of either questionable fact or opinion, not settled in the minds of the enquirers, although either may have been accepted beforehand, on the ground of pre-existing authority; but something new may have occurred to render it susceptible of further elucidation by discussion, and possibly to emancipate it from the category of hereditary *dictum* or *dicta*.

The results of truth seeking trustworthy discussion have been well described as "pure dry light, free from the humour of habit and purged from consecrated usage," and I feel assured that our meetings tend to the same lucid form and ultimate result thus expressed.

Reflecting on the educational condition of the upcoming generation, in reference to our actual and future professional status, my long experience as a teacher at Guy's Hospital, and my extended official position, as an examiner at our College of Surgeons, enable me to speak on this matter with some reasonable amount of authority, and to affirm that the evidence of marked advancement is incontrovertible, and that it is impossible to doubt or overlook the conclusion that the prospect is most cheering for our profession. Various causes have contributed to this improvement; perhaps it is primarily referable to a better brain training in early life, and to a fuller aptitude for the recognition and retention of knowledge, this mental fruition being helped and encouraged by a more natural and true common sense scholastic tuition.

Relying and resting on the outcome of these fundamental advantages, I believe that much of the rapidity of professional acquirements may be justly attributable to and derived from the comparatively recent method now so widely insisted on, of teaching through the medium of the eye, and which is intended to be expressed by the term "practical study."

It must be within the personal experience of each of us, that no impressions are so quickly made, so tenaciously fixed, or so permanently stamped upon the memory as through the eye. This method of study complemented, as it has been of late years, by powerful optical agents, has contributed a great help, which has been eagerly sought and used by the emulous and industrious in the pursuit of knowledge, and at the same time it has become virtually an attractive allurements to the unemployed and the idle.

Powerful minds are now devoted energetically to the exploration of exact knowledge devoid of doubt.

Formerly the conclusions derived from statistics were much extolled, and relied upon, but they never could reach beyond the verge of probability, and that would not content the professional mind of the present day, which will be satisfied with nothing short of a usable certainty.

During the last thirty years, there has been a marked tendency, in the mind of the painstaking reflective physician or surgeon, in his search after truth, to rely only upon provable facts, myriads of which have been garnered and stored in isolated works, and especially in the archives of our various societies; few persons venturing to form hypotheses or theories upon them, until they have been acknowledged, under discussion, by their brethren and accepted, as reliable and proven data, upon which they might confidently reason.

Who is to gather together this massive and varied material and cement it into a harmonious whole?

Who will take, from this time, the foremost needful step in the van of scientific organisers in order to examine, arrange, and digest these stored materials in such a manner as to construct the foundation of a trustworthy reliable authority in the form of a future oracular work of strict and scientific reference?

The necessity for such an interpreter is felt by all of us in these days of bold inquiry, when science is pushing her researches into the mysteries of nature, bringing the animate and the inanimate creations closer to one another, and promising to flood with glowing light the hitherto black line of demarcation and separation of the known from the unknown.

In conclusion, I may be allowed to express my conviction that the Newton of medicine has not yet arrived; but in the meantime I am satisfied that such meetings as these disclose what all the best men of our profession have in view—viz., the promotion of kindly intercourse, and thereby the free interchange of knowledge, the motive force to further and further inquiry, to the quenching of the pretentious and deceptive habits still, I regret, oftentimes exhibited by some of our profession to the public; and, finally, to avow our energetic commendation of the safe foothold, step by step process, by which we trust to reach our ultimate goal—Truth.

AN ADDRESS

DELIVERED AT THE OPENING OF

THE SECTION OF PHYSIOLOGY.

*At the Annual Meeting of the British Medical Association,
in London, August 6th, 1873.*

BY GEORGE MURRAY HUMPHRY, M.D., F.R.S.,

Professor of Anatomy at the University of Cambridge; President of the Section.

THE British Medical Association is still in process of development, and has not, we are glad to think, yet attained to maturity. A few years ago the important advance of instituting sections was made. On the present occasion, when the Association derives the great impulse resulting from a meeting in the metropolis, there are six sections representing six of the important branches of medicine; and it is a matter of no small congratulation that the section of Physiology has been revived. This section was held, and was attended with much success, under the able presidency of Professor Rolleston at Oxford; but since that meeting it has not, I believe, been attempted. It is, I feel, a great honour to be invited to preside in this section at the important meeting now held; and, setting aside all personal feelings and consciousness of inefficiency to discharge the duties of the office to my own and your satisfaction, I did not hesitate to accept the honour, because I perceived that in the selection a compliment was paid to my University, no less than to myself. I was therefore bound to do my best; and I must rely for the rest upon your indulgence and the able assistance of the gentlemen who are associated with me as Vice-Presidents and Secretaries.

I have said that the revival of the Physiological Section is a subject of no small congratulation. Indeed, I feel it to be a matter of the very highest importance; for, without depreciating the other sections, it may be said of this more truly than of any other, that it is, or ought to be, the main connecting link between the Association and science, I may say, indeed, between the Association and the Science of Medicine. Physiology must not simply be at the root, but must itself form the root of medical science. Unless it flourishes and is well tended, the science of medicine cannot thrive and be maintained on a level with other sciences. It cannot but have a tendency to degenerate into empiricism. Far be it from one whose life has, in the main, been spent in pursuing the practical work of the profession, to say anything which should seem to detract from the value of that work, or from the advances which are made in it. These are undoubted. They are sufficiently estimated; and they bring their own reward in their train; so that the influence of a great Association like the present is scarcely required to maintain and give an impulse to practical medicine. We live in an eminently, almost too practical, age; and some of our faults and mistakes are due to the general and growing submission to this influence. In medicine that is peculiarly the case. The practical has, more and more, a tendency to preponderate over the philosophical, which is evinced by a comparison of the writings of physicians and surgeons, of the former more particularly, at the present time with those of the past.

The increasing stringency of the examinations, and the greater range and precision of the several subjects comprised in the examinations, tend to produce this effect. The text-books are more heavily loaded with facts, and the students' minds are more densely crammed with the same, almost to a suffocating extent. A result of this compression may be, and no doubt is, seen in the greater amount of knowledge acquired; and knowledge is a good thing. But to produce its best results, knowledge should minister, and be subordinated, to thought. Not simply to store the mind, but to train the mind to use its store should be the object of education. The subjects of medical education are peculiarly adapted for this purpose; but I do not think that sufficient heed is taken of them in this respect, and it is to Physiology, more than the other subjects, that we must look to restore the balance between thought and knowledge. It teaches us to look beyond the fact into the causes, purposes, relations, and workings of the fact—into "the being's use and end." It gives life to dead anatomy—it leaves us not content with the dreary knowledge that a process exists, and is of given shape and size; but it urges us into the consideration of why it is so, and how it comes to be so. It transforms the miser of facts into the philosophical utiliser of them. I cannot but observe, and observe with regret, that the