importance of the objects. I refer to it for the purpose of making a comparison between these inquiries and those in which we as pathologists are interested. The able staff of naturalists on board the *Challenger* concern themselves with the animals which inhabit the depths of the ocean, and with the conditions which affect their life—we occupy ourselves with human beings and the physical agents which affect their life. These agents are altogether similar in their nature to the others, and require the same methods for their investigation.

We do not for a moment doubt that the care and thought which has been spent in the case of the Challenger expedition in the selection of competent persons as observers, in organising them under a man of science of acknowledged ability, in dividing the work of research among different individuals, in providing them with proper places to work in, and proper instruments to work with, has been wisely spent.

Let us, if we desire to promote efficient research in our own province, follow the same principle. Let us not suppose that because in the past history of medicine the employment of an hour here and an hour there, of weary leisure stolen, as it were, from the practical duties of a laborious profession, has accomplished great things, that this is the most efficient way of proceeding now. It must be admitted that circumstances have changed, and that as we possess resources which before did not exist we ought to use them. In the first place we have young men trained in the methods of chemical and physical work, who no doubt would show themselves as zealous and devoted to experimental researches in physiology and pathology as the young men now on board the *Challenger* in their several lines of inquiry; we have long had hospitals as fields of investigation, and now we have laboratories for the proper carrying on of our work. What we chiefly require is organisation, a clear definition of the purposes to be attained, and a combination of the various agencies at our disposal towards their attainment.

I venture to think that it is an object in every respect worthy of this great Association to further and promote the organisation of physiological and pathological research, by fixing on the questions to be investigated, by appointing persons of acknowledged scientific ability to take the direction of the inquiries, by encouraging young men of the highest ability to devote the earlier years of professional life to research, and by providing the necessary funds.

GALVANISM IN POST PARTUM HÆMORRHAGE.

THE following case may be considered of interest, as furnishing an instance of the efficiency of a mode of treatment for the great opprobrium of obstetric art, which, if not new and little known, is at any rate far from being so widely employed as its numerous advantages would appear to indicate that it should be.

The patient was in an extremely feeble state of health, and subject to epileptiform seizures. Convulsions came on during the first stage of labour, and could only be checked by keeping her under the influence of chloroform for some time. Failure of uterine action occurred before the os uteri was fully dilated; but as it was sufficiently dilatable, forceps (Beattie's) were introduced, and delivery was accomplished. Still, the uterus did not contract, and, after the placenta was removed, hæmorrhage could only be restrained by keeping the hand within the uterus. Grasping and kneading the uterus, cold affusion externally, and injections of cold water *per vaginam*, produced no effect. A dilute solution of perchloride of iron was freely injected into the uterus, but proved ineffectual. The employment of galvanism was then suggested as a *dernier ressort*, and one of Stöhrer's portable coil machines was procured. An interrupted current of considerable intensity was directed through the uterus, one pole of the battery being applied to the abdominal walls immediately over the fundus, by means of a curved plate of copper, and the other placed in the cervix. Almost immediately firm contraction took place; and when the current was discontinued after a short time, the uterus remained securely contracted, and no further hæmorrhage took place. The patient made a good recovery.

To those who have often witnessed, as it has probably been the lot of most general practitioners to do, the bustle and confusion and other disagreeable accessories of a case of obstinate hæmorrhage after labour, any means that tends to diminish these inconveniences must be most acceptable. The use of galvanism as a means of treatment in these cases, besides its remarkable efficiency, as shown by the foregoing case, and which might naturally be expected, judging from its action on contractile tissues generally, possesses many other advantages over the means usually employed; for instance, the cleanliness and simplicity of its mode of application, and the avoidance of those evil consequences in the puerperal state which are so apt to result from the irritation of the uterus, and the exposure and deluging with cold water which usually take place. Therefore it is to be hoped that its efficiency may soon become established beyond doubt, and its employment become as general as it deserves to be.

R. C. MACKINTOSH, M.D., Doncaster.

AN ADDRESS

DELIVERED AT THE OPENING OF

THE SECTION OF MEDICINE

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

By FRANCIS SIBSON, M.D., F.R.S., V.P.R.S.,
Consulting Physician to St. Mary's Hospital, President of the Section.

GENTLEMEN,—Ten years have passed away since the Association met in London, under the distinguished presidency of Dr. Burrows; and during that brief period our numbers have almost trebled themselves, and the science of medicine has made a remarkable and solid advance. This Medical Section, and the various sister sections into which our Association, obeying the true laws of evolution, has divided itself, have come into being since our former meeting in this metropolis; and this, you will agree with me, is a fitting time and place to take a brief glance at the past, the present, and the probable future of medicine, and at the past, the present, and the possible future influence of this Medical Section on the science of medicine.

When I was a student in Edinburgh more than forty years ago, Dr. Home gave us eleven wearisome lectures on the treatment of fever and how to cut fever short; and his ninth lecture begins thus in my notebook: "Exanthematous fevers cannot be cut short." You will not find one word on the method of cutting fevers short in the whole of Dr. Murchison's recent great work on *Continued Fever*. Sir Thomas Watson's masterly letter on the cattle-plague gives expression, in a few brief and clear lines, to our present knowledge of fever and its treatment. Every physician now knows that fever cannot be shortened by one day; and his efforts are directed, like a skilful pilot guiding his boat down the rapids, to the treatment, not of the fever as such, but of the effects of the fever through which the patient must pass. It has been well suggested to me that the physician, in the treatment of a case of fever, resembles the accoucheur in the management of parturition. The labour may advance favourably, and require little aid; but difficulties may occur during its progress that would be fatal but for the aid afforded by the obstetrician.

I will not revive the bloodletting controversy—a subject brought before this Association with admirable force by Dr. Stokes on the one hand, and elsewhere by Dr. Hughes Bennett and Dr. Markham on the other. I feel, however, that many of those patients into whose arm a lancet is now never inserted, would have been freely bled if they had been treated in the bygone days of which I have just spoken. During the many oscillations in the type of disease that have taken place during the last thirty years, the lancet has not been brought into use in this country. It is otherwise, however, in Italy and in Spain, where, I am told, bleedings from both arms, and leeches elsewhere, are the usual practice in acute diseases.

At the very time of which I have been speaking, Dr. Alison in Edinburgh, whose memory is cherished by every student of that day, and Henlé in Germany, and soon afterwards Dr. Sharpey in London, were, by their physiological labours, laying the foundations for that more secure knowledge of disease and its treatment that now prevails.

It is a remarkable illustration of the present direction of the medical mind, that the admirable Address in Medicine by Dr. Parkes, to which we have just listened with such advantage and close attention, and the coming Address in Physiology by Dr. Sanderson, are, or will be, the contributions of two of the physicians who, in this country, have done more than any others to bring physiology and exact inquiry to bear on our knowledge of disease and its treatment. This spirit of exact inquiry into the most intimate functions of life during health and disease, and under the influence of treatment, by means of self-recording instruments of precision, of volumetric analysis, and other agencies, is the spirit of our time. Ludwig, by applying the kymograph to the hæmodynamometer in 1848, enabled the pressure of the blood to write its own story; and Dr. Sanderson relates that "the notion of the kymograph is said to have been suggested by a contrivance of Watt's for registering the pressure of the steam-engine."

Investigation and action—the investigation of each case of disease, and prompt action in its treatment, give life and zest, with its mingled care and hope, to the daily work of every physician. The more complete study of disease and its treatment can, however, only be carried on in the ward, the mortuary, and the laboratory. For this purpose, however, the laboratory ought to be transferred to the ward. The cardiograph of Marey, the recording stethometer of Dr. Sanderson,

and volumetric analysis, ought to be added to the microscope, the sphygmograph, and the urinometer, and the instruments for employing the direct and the interrupted current. By these means, which would require a small knot of good clinical workers, with full time at their command, the investigation of disease, and the action of medicines and other means of treatment, might be steadily investigated, and the foundation might thus be laid for a complete knowledge of disease and of the action of the means employed for its treatment.

Recent inquiries tend to show more and more that many or most other diseases besides the fevers are diffused through the system, and not limited to the single organ in which they show themselves. The affected organ is often the mere local mouthpiece that proclaims the general malady. I would refer here notably to the inquiries of Dr. Sanderson and of many other physicians in Germany, France, and England, into the inoculation of tubercle. This adds to the argument against specialism in the treatment of disease, so forcibly put before the Association last year by Dr. Wilks in his address. The tendency of specialism is to limit the view of the specialist to the favourite haunt of disease by which he has made himself known; and he thus cramps or even loses his power to take a just and broad view of the very disease that he has made his own. I do not here, of course, speak of a true hospital physician who studies disease in the larger sense, and who, from accident or bias, has given greater attention to some diseases than to others. This must happen more or less to every clinical worker who is in earnest and attached to his pursuit. These are the very men who unravel and throw additional light upon individual diseases; but they do so because their keen perception has been quickened and heightened by their large clinical knowledge. The special hospital is one of the foes to clinical inquiry.

It has been well remarked that every great advance in the knowledge of disease, and of its proper treatment, has been preceded by a parallel advance in the knowledge of physiology. Sometimes, as in the instances of John Hunter, Sir Charles Bell, Sir Benjamin Brodie, Marshall Hall, Du Bois Reymond, Claude Bernard, Brown-Séquard, Duchenne, and others, the physiologist who has added to our knowledge of the laws of life has been the physician who has added to our knowledge of the laws of disease. More frequently, the discoveries of the pure physiologist, or of the philosophical chemist, such as Davy, Faraday, Daniell, and Graham, have given light to the physician, and have enabled him to see with clearness, that which he was before struggling in a kind of "clear obscure" to comprehend. He must, however, have been previously at work, in the true spirit of clinical inquiry, upon the very point of coming advance; the door must have been almost opened, light must be struggling in, and he must have been working in the right direction, or the additional light that has been given by the physiologist will not be given to him. He must, so to speak, have almost reached saturation point, and a little stir has been able to crystalize into form what was almost ready to take shape.

It is evident, when we look at the immense field that is now occupied by experimental physiology, that the clinical worker can easily devote himself to physiology, but, if he is to be successful in his own field, he must be a true physiologist.

The physiology of the present day obeys truly the law of evolution; and, while it advances from simplicity to complexity, it advances from confusion to order. The nervous centres are no longer limited, in idea, within the cranium and the spinal cord, but are diffused over various organs. The forces of the circulation are no longer limited, in idea, to the heart, but are diffused over the whole of the arteries, even the most minute; the heart responding to arterial pressure as completely as the circulation through the arteries responds to the contraction of the heart. The respiration is not carried on merely in the lungs, but is diffused through the vessels which carry the oxygen from the lungs. Then the nervous system, the circulation, and the respiration, all work interchangeably upon each other. All the parts weave themselves into the whole, each part working and living in the other.

We thus see that our present larger views of disease correspond to our present larger knowledge of the laws of life, and we can foresee with precision that the medicine of the future, obeying the law of evolution, while it will perhaps advance from comparative simplicity to complexity, will certainly advance from comparative confusion to order.

I will now touch briefly on the past, the present, and the possible future of this medical section of our Association, and will give you, I trust, reasons for the opinion that this Branch of the Association contains within itself the potentiality of adding solidly to our knowledge of disease, and that which is the end and aim of all our inquiries, the treatment of disease.

In the early years of the Association, when it formed, as it were, a single medical section, it was of great service in the advance, as well as in the diffusion, of medical knowledge. Many of the best medical

minds in the provinces came together, with the high object of promoting medical science, and the welfare and unity of the medical profession. I have always been of opinion that, in each great provincial centre, there are several men, or at least one, who stand in parallel ranks, as regards the possession of a high medical mind, with the leading metropolitan physicians of England, Scotland, and Ireland. In each provincial centre there are hospital physicians and surgeons who are appealed to in every case of difficulty by the medical practitioners of the neighbourhood, who, owing to the character of their minds, and their varied intercourse with such cases, see disease, not with the limited vision of the specialist, but with the large view of the true physician.

When men of this high, mental, moral and social standard came together, the knowledge that had been hitherto silent in them, and therefore not adequately developed, received development and expansion and took form and shape. The medical mind of the provinces was effectually stirred, and a series of papers and addresses were delivered before this Association that in their time advanced and diffused the knowledge of disease. Many important communications on the medical topography of the various parts of the country, and several memoirs of great value, were published in our *Transactions*. It will be sufficient if I here name the notable communication of our distinguished associate Mr. Ceely, on vaccination.

The diffusion of medical knowledge, as well as its advance, was eminently promoted by the Annual and Branch Meetings of the Association, where men came together communicating to and receiving from each other sparks and seeds that kindled and ripened into a larger medical knowledge.

The recent establishment of sections—and in detail I reserve myself to this section—has given solidity and more definite expansion to the culture, advance and diffusion of medical science. I would here simply refer to the important communications of Dr. Brown-Séquard, Dr. Bennett, Dr. Gairdner and Dr. Sanderson.

It is however not my intention to give you a history of the work done and doing in this section, but to ask your serious attention to aid in an endeavour to add to the value of this section, and indeed of other sections also, by taking definite and early steps to increase our labours for the advance of the knowledge of disease and of its treatment.

The British Association distributes annually a sum of money, which in 1866 amounted to more than one thousand pounds, in the shape of grants to various workers and committees to enable them to carry on researches for the advance of science. A government grant of £2,000 to the Royal Society is distributed annually to individual workers to enable them to pursue certain definite investigations, the exact character of which is laid before the Government Grant Committee and the Council of the Royal Society.

The grants of the British Association, and the government grant to the Royal Society have, by supplying the working man of science with instruments of research and other needful appliances, enabled him to carry on important investigations that have led to great scientific results that, but for such aid, would have been lost.

A few years ago Dr. Hughes Bennett carried on an important experimental inquiry into the action of mercury with a grant from this Association, and by a subscription entered into by certain of its members.

I would earnestly press upon the Association that they should re-establish the system of grants of money to individual members or committees of the Association for the purchase of such expensive instruments and other appliances as may be required in the pursuit of certain approved inquiries into the nature and treatment of disease.

The inquiries of Denis into the human blood, published in 1830, and followed by those of Andral and Gavarret and other observers, led to a knowledge of the positive effects of two of the then prevailing methods of healing disease—blood-letting and the use of iron. Blood-letting has mainly, in consequence, been practically abolished, and the value of iron as the means of increasing the proportion of red corpuscles in the blood has been established. Recent investigations, of which I have already spoken, as to the intimate nature of disease, and the action of quinine, digitalis, and other medicines, have added materially to our knowledge.

There are many important questions relating to disease and its treatment that are open to, indeed demand, inquiry, and I would here refer to a few of them. The amount of urea excreted during chorea, tetanus, fevers, and other diseases, and the relation that may subsist between the excretion of urea and the temperature of the body, are as yet but imperfectly ascertained. The mode of action of iron in increasing the red corpuscles is unknown. Can the crystalloid, iron, call to itself the colloid protein elements in such proportion as to form red corpuscles, when we know that the colloid is the energetic, the crystalloid the passive form of matter, and thus the crystalloid can diffuse itself through and depart from the colloid without altering its structure? The phos-

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