that we must be judged. The greater the force, the greater the waste, unless it be well applied.

Our Sections, with the masterly addresses on various subjects, are well calculated to tell of progress and to aid it, to thrash out the many questions of medical science, to ascertain the results of new medical practice, and to stimulate thought and invention. Our meetings promote business habits and administrative qualities, as well as sociality and friendship. Our JOURNAL is one of the best, and I believe it is the cheapest, of the media of medical intelligence which the world possesses. Thus far we may be well content. But one work—a work that especially appertains to the Association, the work of collective action, of the pull altogether of eight thousand members of the profession, I mean the work of cumulative observation, or accumulated data—has been too little attempted; or, if attempted, has been productive of too little result. I am aware that anything on a large scale of this kind is a serious undertaking, a gigantic enterprise; and I feel it, therefore, to be worthy of this gigantic Association. It is, perhaps, the only work in which all, or a large part, of the members can really and fully participate, and to which each can contribute his mite. It is almost the only way in which questions relating to temperamental, climacteric, and topographical agencies upon disease and many others can be fully investigated and solved. To engage the members of the Association as participants in any division of such work, would prove one of the most powerful inducements to the cultivation of observation and thought respecting the mass of facts which are passing, now too often unheeded or unnoticed, before their eyes; and would tend, more than any other thing, to deepen their interest in the science of medicine, and to impart the charm of wider usefulness to the daily routine of life.

The knowledge that the project is not novel, and that it has been, to some extent, tried by the Association and by some of its Branches without much result, tells us, if we need the telling, that such a work, to be successful, must be undertaken in a careful, deliberate, systematic manner, with a view to its being carried on continuously and thoroughly, so as to ensure the confidence and enlist the sympathy and co-operation of the members. There must be a well paid secretary or registrar, who will devote himself with zeal and ability to the duty of organising a systematic inquiry, who will attend the Branch meetings for the purpose of stimulating investigation and discussion of the questions submitted, and who will collate and codify the evidence and co-operate with a committee—a *medical investigation committee* and a *medical investigation secretary or registrar*. A valuable adjunct to this method of investigation would be the art of photography with the method of composite portraits, described by Mr. Galton,* whereby typical illustrations of certain conformations, and of the features of temperament and characters of disease, may be obtained. I do not enter into detail. The scope of the proposal will be sufficiently patent; and, for further arguments in its favour, I will refer to excellent papers upon it in our JOURNAL by Dr. Arthur Ransome† and Dr. Mahomed.‡

To the Association I am personally bound, not simply by the conviction of the good service it has done to the profession, and of the still wider mission of good to humanity yet before it; not simply by the many friendships it has opened to me, and the many happy and improving hours it has given me in company with my professional brethren, and the better feeling towards them with which it has inspired me; not merely by the memory of those good and earnest men who, with a keen appreciation of the wants of the profession, and a true presentiment of the future potentialities of such an Association, were its founders; but, further, because the interest in it was awakened in my boyish mind, together with the first sparkling interest in the profession, by one of those founders to whose energy the formation of the Eastern Branch was due. In the well stored and well used library of Crosse of Norwich, five and forty years ago, my little services were enlisted in the work of the Association, not so much for any good they did to it, but rather on account of the gain he knew it would be to me to be early trained in the feeling that a higher vocation than that which I might suppose to belong to the student of medicine, was opening upon me in the vocation appertaining to the membership of a great brotherhood, and in the duty devolving upon me as a member of a great profession. It was no small thing to have one's sympathies thus early awakened and directed. To the Association I have adhered ever since, as a means of keeping those sympathies alive; and, when the proposal was first made that the present meeting should be held in Cambridge, I felt that we were bound to afford you the opportunity you asked of coming to this much loved place, this fair spot upon which our own lot has fallen. I knew that such would be the sentiment of the profession in the district, and that the members of the profession in and around Cambridge would

heartily and liberally respond to the call. I knew that the University and the town would join with us to do you honour. You might have come at a time of greater financial prosperity. You might have waited till our school-buildings were in a more worthy condition; and I trust that the prospect of coming improvement may ever be available as a reason for postponement; but I question whether you would ever have found a more hearty welcome than that which the Profession, the University, and the town of Cambridge, now give to the members of the British Medical Association.

ADDRESS IN MEDICINE,

BY

JOHN BUCKLEY BRADBURY, M.D., F.R.C.P.,

Physician to Addenbrooke's Hospital, Cambridge; Linacre Lecturer in Physic
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MODERN SCIENTIFIC MEDICINE.

WHEN the Committee of Council of this Association did me the honour of appointing me to deliver the Address in Medicine at this meeting, several topics occurred to me as suitable; but none more so than the progress of scientific medicine during the last decade. For several years past, these addresses have dealt with special subjects in pathology or practical medicine, or with a comparison of ancient and modern practice of medicine; and no attempt at summarising or stock-taking, if I may use such a phrase, has been made since our meeting in London, in 1873, when we were all so much charmed by the masterly address of the late Professor Parkes.

In reviewing the progress in the science of medicine during the last ten years, every one must be struck with the influence which discoveries in physics and biology (especially physiology) have had upon it; and, in looking forward, it is impossible not to feel that further advances will largely depend upon discoveries in the physical and biological sciences—sciences which, I am proud to say, this University has of late done much to promote; and in which, by means of her physical, chemical, and biological laboratories, she endeavours thoroughly to train her medical students, as the only sure basis upon which their subsequent more purely medical studies can be built. The future progress of medicine depends, in no small measure, upon students thus scientifically educated and trained to exact methods of investigation. Physics and physiology are advancing the healing art each day, step by step, more nearly to the position of an accurate science.

It will be my endeavour, then, in this address, to show that medicine is something more than a practical art; and that the statement of the late Dr. Whewell, in his book, *The Philosophy of Discovery* (page 34), that “we have even yet no science of medicine”, in the sense in which he used the term science, namely, “a collection of general truths inferred from facts by successive discoverers”; whatever truth there might have been in it when he wrote, is becoming less and less applicable in the present day.

“Art”, as Whewell wrote,* “has ever been the mother of science—the comely and busy mother of a daughter of a far loftier and serenely beauty.”

It has been well said,† that “it may be accepted as an axiom that every reduction of physiological or pathological processes to known physical laws, even if only partially and approximately successful, is a step forward in science; and that if the whole disturbance of nature's equilibrium, from the excessive complexity of the function involved, be beyond our power of analysis, there is still some advantage and a gain to precise observation in cutting off and putting on one side such portions as are susceptible of accurate treatment. The predominance of vague, though necessary, generalisations—such as that of vital action—is thereby materially diminished, and the direction is more closely indicated in which future efforts at advance may most judiciously be directed.”

We can hardly estimate how much modern medicine owes to physics, unless we reflect how helpless the physician in the present day would be in the study of morbid processes and their results, and in the diagnosis

* *Journal of Anthropological Institute*, November 1878.

† *BRITISH MEDICAL JOURNAL*, October 8th, 1864.

‡ *BRITISH MEDICAL JOURNAL*, Jan. 3rd and 10th, 1880.

* Address before the British Association at Cambridge, 1833.

† Croonian Lectures before the College of Physicians, “On Some Applications of Physics to Medicine”, by W. H. Stone, M.B. (*Lancet*, 1879, vol. ii).

and treatment of disease, without such instruments as the microscope, the thermometer, the ophthalmoscope, the laryngoscope, the aspirator, and other instruments in daily use. In the hands of skilled investigators, these instruments of precision have worked changes in the diagnosis, interpretation, and treatment of disease of which the physician and surgeon of an older generation could never have dreamt.*

I do not propose to place before you all the discoveries made by the aid of these instruments during the period alluded to. I shall content myself by referring to those only which appear to be of primary importance in marking the progress of modern scientific medicine.

MICROSCOPE.—By the aid of the microscope, an advance has been made in the exact diagnosis of so-called idiopathic or progressive pernicious anæmia. This disease, although first described by Addison (probably in the *Medical Gazette* for March 1849), has only during the last few years been generally recognised—about fifty cases having been recorded by various observers. So far as I can ascertain, Addison made no microscopic examination of the blood in this disease; but, in the *Guy's Hospital Reports* for 1855, Dr. Wilks, who had been testing the blood in reference to the number of white corpuscles, soon after Bennett's and Virchow's discovery of leukaemia, thus alludes to it: "In that class of cases which had specially gained the attention of Dr. Addison, and which he has designated '*idiopathic anæmia*', and where, above all others, it might be presumed that the existence of an excess of colourless globules was possible, no such condition has been found."† This observation of Dr. Wilks has been confirmed by all subsequent writers on this disease; and, in addition to this means of diagnosis, other important microscopical changes have been noted in the blood in this disease, which help to differentiate it from chlorosis and other closely allied diseases, such as leukaemia, etc.

Messrs. Mackern and Davy,‡ and other observers (especially Drs. Byrom Bramwell,§ Stephen Mackenzie,|| and Finny,¶) have noticed, in blood drawn from persons with this disease by the prick of a needle, that the red corpuscles do not collect into rouleaux, as in health, but lie separately, or form masses of irregular shape; that these corpuscles are very noticeably reduced in number, are variable in size, of great diversity in form; some being oval, others spindle-shaped; some having a tail-like projection; some are larger than the white corpuscles, others not one-fourth of the normal size. In all the abnormal corpuscles, the so-called zoid or yellow substance (hæmoglobin) seems to be collected in one part, leaving the oecoid or rest of the corpuscle (stroma) clear and transparent, and this probably gives rise to the apparent nucleation of the corpuscles.

I have carefully examined the blood in one well-marked case of idiopathic anæmia,** and I failed to find the small spherical red corpuscles regarded by Eichhorst†† as pathognomonic of this disease. Rosenstein, Grainger Stewart, and Bradford have also failed to find these "microcytes"; and they have been seen by Cohnheim in a case of medullary leukaemia, by Dr. Litton in a case of phthisis,‡‡ and by Dr. Greenfield in a case of Hodgkin's disease.§§ Dr. Osler of Montreal has found similar corpuscles in his own blood, and in that of persons free from disease. These corpuscles cannot, therefore, be regarded as diagnostic of essential anæmia; but the three combined abnormal conditions—viz., diminution of the number of the red corpuscles, their paler colour, and the alteration of their shape and size—may be regarded as characteristic.

C. M. Sørensen of Copenhagen||| emphasises the counting of the red corpuscles for the purpose of exact diagnosis, and, from observations in eleven cases of this disease, says that the number of red corpuscles counted (according to Malassez's method) is only one-fourth to one-twelfth of the normal number. Dr. Stephen Mackenzie¶¶ has also made some valuable observations on the reduction of the red corpuscles, in various anæmic states; but in none did he find such a diminution as in this disease.

In August of last year I saw, in consultation with Dr. Ingle of this town, a case in which it was impossible to arrive at a correct diagnosis without a microscopic examination of the blood. The case was that of a married woman, who, during the whole of her pregnancy and for some time previously, had suffered from anæmia. Her condition

during labour was so critical that Dr. Ingle asked a fellow-practitioner to be present at the delivery. She lost scarcely any blood during her confinement; but when I saw her, a few days subsequently, she appeared perfectly blanched, the lips and gums being quite bloodless. She had extreme breathlessness, palpitation, and giddiness. Loud venous and cardiac bruits were audible. The temperature was 101° Fahr., and the pulse was remarkably soft and compressible. There was some enlargement of the spleen and liver, but none of the lymphatic glands. We could detect no renal, cancerous, or tubercular mischief; and the hygienic surroundings of the patient were good. There had been no great hæmorrhages nor diarrhoea, nor had the woman been exposed to any malarial influence. I at first thought the case was one of idiopathic or progressive pernicious anæmia, which, according to Gusserow, Biermer, and others, occurs most frequently in pregnant women.* A microscopical examination of the blood, however, showed a large excess of white blood-corpuscles; the proportion of white to red being about fifty, instead of three, to a thousand. Now, as in progressive pernicious anæmia there is never any absolute increase of the white corpuscles, we were able in this case to give a more cheerful prognosis; the patient, under the influence of iron, digitalis, and good port wine, making a rapid and perfect recovery. The woman suffered to an excessive degree from the temporary leukaemia or leucocytosis of pregnancy. Iron did good in this case; whereas it has been found useless in pernicious anæmia, arsenic being the only remedy which has hitherto been found beneficial. Whilst upon the subject of the microscopical examination of the blood, I must not fail to mention the ingenious hæmacytometer devised by Dr. Gowers† for estimating the corpuscular richness of any specimen of blood. This instrument has the great advantage of accuracy and simplicity of application in clinical practice, and is an improvement in the latter respect upon the "compte globule" of Malassez‡ and the hæmatometer of MM. Hayem and Nacht. M. Malassez has also devised an instrument, the hæmachromometer, for estimating the amount of hæmoglobin in blood, which is both accurate scientifically, and most convenient clinically. He has pointed out that blood-corpuscle counting is of little diagnostic or clinical use unless combined with estimating at the same time the amount of hæmoglobin present.§

The diagnosis of idiopathic anæmia by means of the microscope furnishes us, then, with a "general truth" as to the abnormal conditions of the blood-corpuscles which has been "inferred from facts by successive discoverers"; and thus may serve to illustrate the statement, that we have, at the present time, a true science of medicine in Whewell's sense of the word.

To mention all that medicine has gained by the use of the microscope during the last few years would be to give a record of pathological progress during the period, and would include such large and important subjects as the recent pathology of tubercle, pyæmia, septicæmia, relapsing fever, blood-entozoa, the infective element of vaccine lymph, etc. One further application of it as an instrument of precision is of considerable interest at the present time, and ought, perhaps, to be noticed in this address. It was only in 1860 that Zenker of Dresden made out, *post mortem*, the disease of trichinosis in a patient that was supposed to have had typhoid fever. How many cases of trichinosis had before that been attributed to some other condition, cannot be estimated. The microscope has discovered the disease, and by the aid of this instrument it will probably be stamped out. In the year 1876, there were in Prussia no fewer than twelve thousand inspectors charged with the duty of inspecting slaughtered swine. Trichinæ were found in one of every two thousand animals. This is a humble use of the microscope, and one not entailing delicate manipulation and high magnifying powers. It is mainly to Professor Virchow, eminent no less as a practical administrator than as a scientific pathologist, that Prussia owes this great triumph of preventive medicine.

Mr. Power, one of the medical officers of the Local Government Board, was enabled, by microscopical examination of the muscles of the only fatal case of the outbreak which occurred on board the reformatory school-ship *Cornwall* in September and October of last year, to show the disease to be trichinosis, and not, as was at first supposed, enteric fever. It is highly probable that in future many cases of supposed enteric fever, for which no adequate cause can be discovered, will prove, as in the instance I have just quoted, to be due to eating trichinised meat.

A very remarkable fact in connection with this investigation is the discovery by Mr. Power of bodies somewhat resembling trichinæ in the

* See a very able leader on the "Spirit of Modern Medicine", *BRITISH MEDICAL JOURNAL*, October 4th, 1879.

† *Guy's Hospital Reports* for 1878, p. 185.

‡ *Lancet*, May 1877; also *Guy's Hospital Reports*, 1878, p. 205.

§ *Edinburgh Medical Journal*, November 1877.

¶ *Lancet*, December 1878.

¶¶ *BRITISH MEDICAL JOURNAL*, January 10th, 1880.

** *BRITISH MEDICAL JOURNAL*, December 30th, 1876.

†† *Centralblatt für die Medicinischen Wissenschaften*, June 24th, 1876.

‡‡ *London Medical Record*, 1877, p. 120.

§§ *Clinical Society's Transactions*, vol. x, p. 52.

||| *Allg. Med. Centr. Zeitung*, No. 54.

¶¶ *Loc. cit.*

* *Medical Times and Gazette*, November 21st, 1874.

† *Lancet*, December 1st, 1877.

‡ *De la Numération des Globules rouges du Sang*. Pamphlet. Paris, 1873.

§ *London Medical Record*, 1879, p. 257. See also contributions to Clinical Hæmometry by Baxter and Willcocks, *Lancet*, March 6th, 13th, and 20th, 1880.

voluntary muscles of two undoubted cases of enteric fever which had died in St. Thomas's and the Greenwich Hospitals.* Mr. Power offers at present no positive opinion as to the nature of these bodies, or their relation to enteric fever; but, if this disease should be found to be a form of trichinosis, our views as to its etiology and pathology must be very much modified.

THERMOMETER.—But the thermometer has done even more than the microscope to place medicine upon a scientific basis, and to refute the statement that “we have even yet no science of medicine.” I think it may be said without exaggeration, that the treatise on *Medical Thermometry* by Professor Wunderlich has more than any other work furthered the progress of medicine during the last ten years; for it is only during this period that the thermometer has come into general use in the profession, although the first edition of Wunderlich's book was published at Leipsic in 1868. This physician was enabled, from complete thermometric observations, extending over a period of sixteen years, in many thousand cases of disease, to abstract and formulate well-founded general principles from the mass of separate cases; or, in other words, to form a collection of general truths inferred from carefully recorded facts. Owing to his treatise, we have been able to diagnose diseases which at an early stage were previously confounded; *e.g.*, acute tuberculosis and enteric fever.† We have also become acquainted with the typical course which certain diseases run; and it is possible from thermometric observations alone to predict with almost absolute certainty the progress which many acute diseases are making. Probably no one phenomenon helps us so much as the temperature of a patient to reveal the existence of complications, and to predict the favourable or unfavourable issue of fevers and inflammations. Furthermore, as we have learned the natural course of most acute diseases, so have we come to trust less in drugs, and to leave more to nature, or perhaps I should say to careful nursing, rest, cleanliness, and suitable nourishment. Again, as the temperature can neither be feigned nor falsified, the thermometer may render us assistance in determining whether a disease is feigned or not.

In some diseases, such as acute rheumatism and enteric fever, the temperature indicates more truly the gravity of some cases than any other phenomena. It sometimes points out that the temperature is rapidly becoming so great as to be incompatible with life, unless measures be immediately taken to reduce the hyperpyrexia.‡ Dr. Wilson Fox and others have shown that, by appropriate cooling of the body by baths and other external means, patients suffering from acute rheumatism, with a temperature of 110° Fahr., may be rescued from death. The method of cooling the body by affusion of cold or tepid water was known to Dr. Currie of Liverpool and other physicians at the end of the last century; but, until the last few years, this mode of reducing abnormal temperatures has never been systematically and scientifically carried out. In the German hospitals, the method of treating the pyrexial state by the external application of cold has come into general use, and has also to some extent been introduced into private practice. Jürgensen, Liebermeister and Hagenbach, Ziemssen and Immermann, Brand of Stettin, and others, have published statistics of several thousand cases of fever treated in this way; from which it appears that the mortality has been reduced more than one-half, being now only from 3 to 10 per cent. In our own country, this method of treating enteric fever has not carried conviction to the minds of Sir W. Jenner§ and of Dr. Collie,|| Medical Officer to the Homerton Fever Hospital; but is well spoken of by Dr. Ord of St. Thomas's Hospital and Dr. Cayley¶ of the Middlesex and London Fever Hospitals. My own experience of this mode of treatment is limited to one case of enteric fever, in which the temperature reached 106.8° Fahr., and which was successfully treated by baths.** In progress of time, this mode of reducing the febrile heat of the body will, I think, become generally practised; and though, since the first introduction of the thermometer

for clinical purposes by Van Swieten and De Haen,* more than a hundred years elapsed before this instrument became generally used, let us hope that it may not take a century for this simple method of treating pyrexia to meet with general approval by the profession and the public, both of which, at the present time, seem to have an unwarrantable prejudice against it.

The value of the thermometer in clinical medicine has recently received a fresh illustration in the most interesting researches of Peter and Vidal on local temperatures in acute pleurisy, phthisis, and some abdominal diseases.† M. Peter had for a long time been anxious to settle the question whether a local morbid action was accompanied by a local elevation of temperature, and he has been able to answer the question in the affirmative.

M. Peter has found in acute pleurisy, from a long series of investigations, (1) that the parietal temperature outside the pleurisy is from one-half to two degrees Cent. higher than the average temperature of the patient; (2) that the more rapid the effusion, the quicker the elevation of temperature; (3) that when secretion is not going on, and the level of the fluid remains stationary, the elevation of the parietal temperature decreases, but the temperature is still from ½° to 1½° Cent. higher than the sound side; (4) that pleurisy not only raises the parietal temperature of the diseased side, but also that of the opposite side; but the parietal temperature of the diseased side is always higher than that of the healthy; (5) that, while spontaneous absorption of the effused fluid is going on, the parietal temperature drops gradually; (6) that in dry pleurisies the local excess of heat is less than when there is effusion, and the return to the normal temperature also occurs more rapidly; and (7) that the absolute elevation of the local temperature on the diseased side is more considerable than the absolute elevation of the axillary temperature.

M. Peter has also investigated the results of thoracentesis upon the parietal temperature, and has found, when the effusion is not reproduced, that although there is, immediately after the puncture, a slight rise, which lasts for some hours, nevertheless the parietal temperature afterwards decreases, and continues to do so until the normal figure is reached;‡ unless the effusion is reproduced, when the local temperature rises again.

The observations of M. Peter on local temperatures in pulmonary phthisis, which have been fully confirmed by M. Vidal, are even still more interesting. He believes that, as soon as tubercles occur at any point, the local temperature rises there; and he points out that in doubtful cases of phthisis, where the physical signs are not developed, this local thermometry may materially assist us in arriving at a correct diagnosis.

M. Peter has made a further communication to the Académie de Médecine on the subject of local temperatures in abdominal diseases; and he has indicated the differences between the local temperatures of the abdominal parietes in ascites and in the various forms of peritonitis—viz., (1) that which arises by extension from a chronic phlegmasia of the stomach, “gastrite scléreuse”; (2) chronic tubercular peritonitis; and (3) chronic cancerous peritonitis.

M. Peter used an ordinary clinical thermometer for the observations, which, on account of its simplicity, he prefers to instruments of greater precision.

Local thermometry has also been applied to the detection of the precise locality of a cerebral lesion by Broca,§ Dr. Carter Gray|| of Brooklyn, and others. These temperature observations seem to be of value for the purpose of localising lesions. Dr. Gray has found, from observations on 102 males, among other things, that in health the temperature of the left side of the head is nearly one degree higher than that of the right, and that the average temperature of the frontal and parietal regions is nearly two degrees higher than that of the occipital. Lom-

* BRITISH MEDICAL JOURNAL, April 24th, 1880.

† Dr. Waters of Liverpool has found that in a very large majority of cases of phthisis the temperature attains its maximum about 5 P.M., whereas as a rule the temperature in enteric fever is higher at 9 P.M. than at 5 P.M. This difference may help in the diagnosis of a doubtful case (BRITISH MEDICAL JOURNAL, December 20th, 1879).

‡ The cases of abnormally high temperatures recorded by Mr. Teale of Scarborough and by Dr. Donkin (Lancet, May 11th, 1878; March 15th, 1879; BRITISH MEDICAL JOURNAL, December 20th, 1879, and January 24th, 1880) and others, are very difficult of explanation in the present state of physical and physiological knowledge. So far as I can see, every possible precaution seems to have been taken to exclude imposture in these cases.

§ Lancet, November 1879 p. 715.

|| BRITISH MEDICAL JOURNAL, September 20th, 1879. Dr. Collie says those cases in which the bath is most needful are those in which, according to Liebermeister, it is contraindicated—viz., “where there is a very high degree of heart-weakness.”

¶ BRITISH MEDICAL JOURNAL, April 24th, 1880.

** BRITISH MEDICAL JOURNAL, vol. ii, 1872.

* Sanctorius applied the thermometer to the determination of the temperature of the body so long ago as 1638.

† Bulletin de l'Académie de Médecine, 2nd series, vol. vii, Nos. 8, 37, 38, etc. See also London Medical Record, August 1879; and Lancet, January 3rd, 1880. The subject of local temperatures has also been worked at by Dr. Seguin of New York.

‡ In a case of acute pleurisy, with copious effusion, occurring in a young unmarried woman of 22, with previous good health, under my care in Addenbrooke's Hospital in August 1879, and in which forty-seven ounces of fluid were withdrawn by the aspirator, to the very great relief of the patient, and with a subsequent gradual reduction of temperature and restoration to health, the temperature, after the thoracentesis, both in the axilla and on the walls of the chest, was greater on the unaffected than on the diseased side—*e.g.*, on August 18th, five days after the tapping, the temperature in the axilla on the diseased (left) side was 102° Fahr.; on the unaffected (right), 102.5° Fahr. Two days later, the parietal temperature on the affected side was 101.4°; on the sound side, 101.8°. Other observations were made with corresponding results. M. Peter's papers only became known to me after I had tapped the chest in this case, and I have had no further opportunity of testing his other results.

§ Journal de Médecine et de Chirurgie Pratiques, Art. 10,634 et Art. 11,288
|| New York Medical Journal, August 1878.

bard* has also made elaborate experimental researches on the regional temperature of the head; but he is not "inclined to place much reliance on the examination of the relative temperatures of different parts of the integument of the head as a means of medical diagnosis". Dr. Gray, however, thinks the surface-temperatures at various points of the head indicate similar differences of temperature in the convolutions lying beneath those points; and he refers to a case of tumour of the brain, occurring in the practice of Dr. Frank W. Rockwell of Brooklyn, in which the diagnosis of the locality of the intracranial morbid growth was made with a thermometer applied externally, and afterwards verified by a *post mortem* examination. Other cases have been recorded† which, notwithstanding the adverse criticisms of Rendu,‡ seem to show that we can attribute a positive value to local thermometry in making regional diagnoses in cerebral cases.

General thermometry has been found useful in diagnosing cerebral hæmorrhage from alcoholic poisoning, the general bodily temperature (rectal) falling at first below the normal in cerebral apoplexy,§ but not in drunkenness. Such a case is recorded by Mr. Foster in the *Lancet* for December 27th, 1879.

General thermometry also assists us in the differential diagnosis of true apoplexy from the so-called apoplectiform seizures, which occur in progressive general paralysis, disseminated sclerosis, cerebral softening, and also from uræmic coma. Charcot says, "I have demonstrated by repeated observations that, in true apoplexy, especially when it depends upon cerebral hæmorrhage, the temperature constantly diminishes some moments after the attack, and afterwards remains, generally for at least twenty-four hours, below the normal standard, even when intense and reiterated convulsive fits occur"; whereas, in the congestive attacks (so-called apoplectiform seizures) which occur in progressive general paralysis and in disseminated sclerosis, "the temperature, on the contrary, rises above the physiological standard, and tends to become gradually more and more elevated, during the whole continuance of the attack."

In cases of cerebral softening, according to Bourneville, the "period of initial lowering" of temperature commonly met with in cerebral hæmorrhage, is either absent or much less slightly marked; and, after the first two hours in a case of softening, the temperature may suddenly rise to 102° or even 104°, though it soon descends again to the normal standard, and afterwards exhibits altogether irregular oscillations (unless the pons Varolii be the part affected); whereas in cerebral hæmorrhage, it is found that, if the temperature, after the "initial lowering" rises soon after the attack beyond 102.5°, it rarely sinks again to the normal standard, unless under the influence of a shock resulting from fresh hæmorrhage (Bastian).|| "In uræmic coma, according to Bourneville, the temperature of the body begins to fall at the onset of the seizure, and continues to sink as long as the coma persists, so that it may fall as low as 90° Fahr. in fatal cases. On the other hand, in coma due to cerebral hæmorrhage or softening, the lowering of the temperature is slighter in amount, and, in cases not fatal within this period, rarely lasts longer than twelve to twenty-four hours" (Bastian).¶

The thermometer is also useful in forming a prognosis in these diseases, but into this I have not time to enter.

OPHTHALMOSCOPE.—Physics have also furnished us with the ophthalmoscope, an instrument which, besides being invaluable in the recognition of diseases of the eye, has of late years assisted us materially in the diagnosis of intracranial tumours, syphilis, chronic Bright's disease, acute tuberculosis, tubercular meningitis,** cerebral embolism, locomotor ataxy, and other diseases which need not here be specified.

No well-educated physician in the present day would think of systematically investigating disease, especially of the nervous system, without an intimate knowledge of ophthalmology. Dr. John Ogle was the first physician in this country to introduce the ophthalmoscope into medical practice; and Dr. Clifford Allbutt's book, *The Ophthalmoscope in Nervous and Renal Diseases*, has, as Dr. Hughlings Jackson well expresses it, "done more than any other work towards the integration of ophthalmology with general medicine." Dr. Gowers's *Manual of*

Ophthalmology (Churchill, 1879) is an excellent representation of what is known on the subject up to the present time. In his address on "Ophthalmology in its relation to General Medicine", delivered before the Medical Society of London,* Dr. Hughlings Jackson pointed out how frequently cases of supposed brain-disease are indirect effects of anomalies of refraction, readily recognisable by the ophthalmoscope, and how the correction of a hypermetropia or a myopia by appropriate spectacles may completely remove these *quasi* cerebral symptoms, and save patients from needless drugging with "nervine" and other medicines. These cases show so well the value of a knowledge of physics (optics) not only in the diagnosis of certain disorders, but also in their treatment, that I do not hesitate to quote a passage from the address on this subject. "Mr. Brudenell Carter", Dr. Jackson says, "has reported a remarkable case of myopia, simulating brain-disease, in the eighth volume of the Clinical Society's *Transactions*. This report should be carefully studied by physicians. The patient, for supposed brain-trouble, took a voyage to Australia, but was no better for it. He was told that he 'must abandon the idea of carrying on the family business, or of taking any active part in life'. This patient was immediately, thoroughly, and permanently cured by the adaptation of appropriate spectacles. The possibility of any anomaly of refraction, or any eye-defect, being at the bottom of that patient's troubles, seems not to have occurred either to himself or his doctors. He did not consult Mr. Carter for any defect of sight, but because he had heard that ophthalmic surgeons had an instrument useful in the investigation of diseases of the brain."

Dr. Jackson also relates the case of a medical student who had attacks of vomiting and frontal headache brought on by reading, and on account of which he was obliged to give up work. After travelling abroad for two years, doing nothing towards his career, he was fitted with glasses suitable for the hypermetropic variety of astigmatism, and has been well ever since, and graduated at the London University.

The following case, which came under my observation in January 1879, is one of no uncommon occurrence. A lady who had been ill for some time, and under two medical men, had occasion to consult an oculist for some defect of vision. The ophthalmoscope revealed retinal hæmorrhage, such as is met with in some forms of chronic Bright's disease. The urine was now for the first time tested, and found to contain a considerable quantity of albumen; but, previously to seeing the oculist, renal mischief had never been dreamt of. The lady died about eighteen months afterwards, with well marked uræmic symptoms.

Dr. Gowers relates† a case, in which the detection of an embolus in the central artery of the retina was the first thing which drew attention to the existence of the cardiac affection from which the patient suffered. The patient applied at the Moorfields Ophthalmic Hospital for a defect of vision, and then she was found to have mitral constriction.

The ophthalmoscope often enables us to detect inherited syphilis, when other indications, such as the peculiar teeth, are absent. The relation of disseminated choroiditis to syphilis is extremely striking and important; and such a distinguished observer as Hutchinson has gone so far as to say, that the patches of disorganisation left by choroiditis are almost as pathognomonic of inherited syphilis as the notched teeth.

Other interesting recent researches in this field of medicine are those of Dr. Gowers on the diminution of the calibre of the retinal arteries;‡ in some cases of Bright's disease with increased arterial tension; and those of Quincke,§ Becker,|| and Dr. Stephen Mackenzie¶ on spontaneous visible pulsation of the retinal vessels in connection with aortic regurgitation; and those of Mackenzie and others, of retinal hæmorrhages in connection with purpura, leucocythæmia, idiopathic anæmia, ague, and diabetes.

Retinal hæmorrhages have also been observed in septicæmia and pyæmia. In puerperal septicæmia, they almost invariably occur during the last two or three days of life, according to Litten; and they augur an unfavourable termination of the case. As these hæmorrhages are not found in acute specific diseases, such as enteric fever, they are useful in diagnosis as well as prognosis.

Another important condition, revealed to us by the ophthalmoscope, is the simple atrophy of the optic nerve—atrophy without precedent neuritis—which is seen in some cases of locomotor ataxy, and which may be of help in the recognition of this disease at an early stage. This simple optic atrophy can be sometimes seen before ataxy begins; and along with absence of the "tendon-reflex", or with the presence of the lightning-like pains, it is an almost certain indication that the disease has commenced.

* *Experimental Researches on the Regional Temperature of the Head*. H. K. Lewis. London: 1879.

† *American Journal of Medical Sciences*, July 1879.

‡ *Revue Générale des Sciences Médicales*. Art. des Localisations Cérébrales Corticales. Par H. Rendu, 15 Janvier, 1879.

§ Charcot on *Diseases of the Nervous System*, New Sydenham Society, 1877, p. 209; also references there given, especially Bourneville, *Études Cliniques et Thermométriques sur les Maladies du Système Nerveux*. Paris: 1872.

|| *Paralysis from Brain-Disease*, 1875.

¶ *Ibid*.

** See Dr. Garlick's paper, communicated to the Royal Medical and Chirurgical Society, session 1878-79, for changes in the choroid and optic discs in twenty-six cases observed at the Hospital for Sick Children. In six of these cases the ophthalmoscope was of real diagnostic assistance, and in two cases it revealed undoubted meningitis several days before the symptoms were diagnostic.

* *BRITISH MEDICAL JOURNAL*, 1877, vol. i.

† *Manual of Ophthalmology*, case 48, p. 318.

‡ *Medical Ophthalmology*, pp. 12 and 13.

§ *Berlin. Klin. Wochenschrift*, 1868, No. 34; and 1870, No. 21.

|| *Arch. für Ophthal.*, xviii, 206-206.

¶ *Medical Times and Gazette*, 1875, vol. i.

The recognition of optic neuritis is of great value both in the diagnosis and prognosis of intracranial tumours. According to Gowers,* it is present in at least four-fifths of these cases at some period of their growth; and its subsidence, when it "has not reached any considerable degree of intensity, may be taken as indicating, in most cases, a retrocession of the growth, and a neuritis of very chronic course affords evidence that the progress of the tumour is equally chronic".

I think I have said enough to show that, apart from any symptom suggesting ocular disease, the eyes should be examined with the ophthalmoscope as a matter of routine, just as we feel the pulse and look at the tongue. This is the only way in which we can avoid errors of diagnosis and can treat our patients upon scientific principles, and thereby raise medicine from the region of pure empiricism. This also is the only method in which we can make the teaching of medicine intelligible to our students, and by which we can encourage them to be constantly cultivating the faculty of observation and comparison; for it has been truly said that "all observation is suggested by comparison", and "experience is founded in a well-directed and extended observation".†

The ophthalmoscope must, therefore, no longer be regarded as an instrument of use only to the ophthalmic surgeon, but as a most valuable instrument in the detection of many morbid states which come under the notice of the physician.

LARYNGOSCOPE.—Our knowledge of the uses of the laryngoscope in clinical medicine to-day is little in advance of what it was ten years ago. The applicability of this instrument in medicine had, previously to this, been almost carried to its utmost by Morell Mackenzie, Sieveking, George Johnson, and others, not to mention others than our own countrymen; and their results have withstood the searching investigations of more recent labourers. Some new facts have, however, been added to our store of knowledge in this department of medicine.

Owing more especially to the careful observations of Dr. Marcet,‡ we can detect tubercular disease in the larynx before there are any physical signs of its development in the lungs. When laryngeal phthisis is present, there is a "white, milky, probably purulent mucous fluid in the laryngeal cavity". The diagnosis of laryngeal phthisis is of more value in prognosis than is generally supposed; for if phthisis can be detected in the larynx, we may be quite sure that the lungs either are, or will shortly become, tuberculous, if not obviously so at the time. It is also a well established fact that those cases of phthisis in which the larynx is early involved are less amenable to treatment than most other cases; and hence we are compelled to give a more gloomy prognosis.

We are also indebted to Dr. Marcet (of whom it may well be said *nihil teligit quod non ornavit*) for pointing out the importance of examining the epiglottis with the laryngoscope.§ Cases of simple and syphilitic inflammation of this organ may be mistaken, as he has shown, for tubercular disease of the larynx, unless an examination is made with the laryngoscope.

In inflammation of the larynx, the laryngoscope helps us to ascertain the presence or absence of membrane, which the report|| on the subject of croup and diphtheria presented to the Royal Medical and Chirurgical Society by a committee, of which Dr. Dickinson was chairman, has shown to be of the highest importance, both as regards prognosis and treatment.

About 90 per cent. of the cases of membranous inflammation of the larynx prove fatal; and of the 10 per cent. of recoveries, there are few that survive unless tracheotomy be performed. Indeed, "if a child have laryngeal obstruction and membrane is seen in its throat, the chances are that it will either die or be tracheotomised, and not improbably both". On the other hand, cases of non-membranous inflammation of the larynx, even those in which dyspnoea is severe and protracted, almost invariably end in recovery; and the worst cases hardly ever require tracheotomy. Membranous inflammation of the larynx is, in a vast majority of cases, diphtheritic, and accompanied by albuminuria; whereas, in non-membranous inflammation of this organ, the urine is seldom albuminous. Although the committee were unable to settle the vexed question as to what constitutes croup and what diphtheria, the evidence before the committee led them to the conclusion that most cases of membranous inflammation of the larynx were of a diphtheritic character.¶

SPHYGMOGRAPH.—In the field of medicine in which the sphygmograph has been used, the harvest has been more abundant than in the case of the laryngoscope, chiefly owing to the researches of Burdon Sanderson having been elaborated by Galabin, Mahomed, and others. In his thesis, read in 1873, for the degree of M.D. in this University, Dr. Galabin, formerly Fellow of Trinity College, corroborated the views of Burdon Sanderson, George Johnson, and others, on the use of this instrument in estimating the amount of arterial tension, as gauged by the height of the tidal or predicrotic wave of a pulse-tracing; and for the first time pointed out that high arterial tension exists in acute as well as in chronic Bright's disease. The condition of high blood-pressure is of the greatest importance clinically, and should be watched and estimated as carefully as the body-temperature, as there is no doubt it will be when the sphygmograph has been further simplified. High blood-pressure gives the earliest indication of the grave series of degenerative changes throughout the body known as chronic Bright's disease, and may, if neglected, lead to disastrous results both in disease of the arteries and of the heart. High blood-pressure is the cause of all so-called heart-disease in old persons; it is very amenable to treatment, and its treatment is imperatively necessary. Dr. Galabin writes: "I believe that one of its (sphygmograph's) successful applications would be to estimate the probable duration of life, by showing how far the vascular system has undergone the changes to which it is subject with advancing years, or which may be the only indication of commencing Bright's disease."

Dr. Handfield Jones† has recorded a series of cases in which, without albuminuria or other symptoms of Bright's disease, the sphygmograph has sufficed to diagnose the disease, the high pressure in the pulse being really its pathognomonic symptom. Of the value of the high tension in prognosis he thus writes: "If I were bold enough to be a prophet, I should point to the time when the elder folks, instead of waiting till they have had a stroke of apoplexy or a touch of paralysis, or are laid up with arterio-capillary fibrosis or morbus Brightii, and then hurriedly summoning a physician to do impossibilities, will seek his advice betimes, asking him to supervise their vital functions, regulate their mode of life, and teach them to stay the morbid changes which they know may be silently progressing."

In a paper published in 1874,‡ Dr. Mahomed tried to show that a chronic condition of high blood-pressure led to arterio-capillary fibrosis. This view he has further elaborated in a paper in the last volume of the *Guy's Hospital Reports*, where he says that the hard pulse—the pulse of high tension—is the sign of Bright's disease; and that it should altogether replace albuminuria, for this is only exceptionally present.

High blood-pressure gives rise to many functional as well as structural disorders. In the paper referred to, Dr. Mahomed§ described the occurrence of this condition in an acute and transient, as well as in a chronic and permanent, form, as the result of certain blood-poisons, and as an antecedent of kidney-disease. He has also demonstrated its existence in pregnancy, and thus indicated the connection between pregnancy and kidney-disease (so called), and thus with puerperal eclampsia.

This condition of high blood-pressure appears to be recognisable early in life, before it has given rise to any structural changes or symptoms, and may be described as depending on the *diathesis*, or less correctly on the *temperament*, of the person. It is a condition which, when once detected, should be closely watched and treated, otherwise it will develop into chronic Bright's disease.

Of the value of the sphygmograph in valvular disease of the heart, experience has shown that it is of use more as an aid to prognosis than to diagnosis; it enables us to gauge the extent of the lesion.¶ It is also very valuable as a guide to treatment, and in watching the effect of treatment; also in estimating from time to time the advance or otherwise of the disease by the comparison of tracings taken at different periods.

Dr. Mahomed has elaborated¶ the use of the sphygmograph in the diagnosis of aneurism of the aorta; he has shown that it may in some cases be of value in determining the site of an aneurism, and in estimating the amount of arterial tension present and the result of treatment upon it. The plan of treatment advocated in aneurism by Mr. Tufnell has for its object the reduction of arterial tension.

The sphygmograph is further valuable as a scientific means of watching the effects of drugs on the vascular system, especially with a view

* *Op. cit.*, pp. 133 and 134.

† *Todd's Clinical Lectures*, second edition by Dr. Beale, pp. 37-8.

‡ *Contributions to the History of Laryngeal Phthisis*, Royal Medical and Chirurgical Society, February 23rd, 1875.

§ *BRITISH MEDICAL JOURNAL*, July 7th, 1877.

¶ *Medical Times and Gazette*, May 17th, 1879.

¶ See an interesting discussion on the relation of Croup and Diphtheria, before the Glasgow and West of Scotland Branch, especially the remarks by Dr. Gairdner, *BRITISH MEDICAL JOURNAL*, February 21st, 1880.

* *Thesis*, p. 17.

† Some Experiences of the Sphygmograph in Medicine, *Lancet*, 1876.

‡ The Etiology of Bright's Disease and the Pre-albuminuric Stage, *Transactions of the Royal Medical and Chirurgical Society*.

§ *Op. cit.*

¶ Vide Mahomed's paper, *Medical Times and Gazette*, September 21st, 1879.

¶ Some Indications for the Diagnosis and Treatment of Aortic Aneurism, *Medical Times and Gazette*, August 30th, 1873, and *BRITISH MEDICAL JOURNAL*, vol. ii, 1377.

to their use in the treatment of Bright's disease and of aneurism by reduction of arterial tension. Above all, it is valuable as an educator and interpreter to the finger; it has taught us the meaning of the *tactus eruditus*, and will always be of the utmost importance in teaching students what to feel for in the pulse.

The possibility of recognising Bright's disease in its pre-albuminuric stage by means of the sphygmograph leads me to think, with Dr. Handfield Jones, that this instrument has a great future before it. When people become wise enough to pay their doctors for keeping them in health by periodically examining them to see if there be any abnormal change taking place in their bodies, the sphygmograph must come into general use in our profession. How many valuable lives might be prolonged if this suggestion which I have thrown out were acted upon! An indigestion, with increased arterial tension, is, as Dr. Saundby* and others have shown, the forerunner of Bright's disease; and this functional stage of the malady is probably quite amenable to treatment. This condition of high arterial tension occurs in those who eat too much nitrogenous food for the exercise they take, and thus overtax their digestive organs and load their blood with imperfectly assimilated food.

The remedies for high arterial tension generally are a reduction in the amount of nitrogenous food, purgatives, diaphoretics, bleeding, etc. A milk-diet is of the greatest value in some of these cases, as Dr. George Johnson was the first to point out. I have over and over again relieved this condition of the circulatory system by placing patients in bed and on a milk-diet. To show the value of bleeding in this condition, I cannot do better than quote a case recorded by Dr. Alexander Harvey, Emeritus Professor of Materia Medica in the University of Aberdeen, in his work *First Lines of Therapeutics*, of a young lad of eighteen, in whom general anasarca, accompanied by profound coma, occurred rapidly after scarlatina, and yielded at once to general blood-letting—the coma disappearing in ten minutes and the anasarca within twenty-four hours after the vascular tension had been relieved.

As the profession comes more and more to recognise the importance of increased blood-pressure, the practice of bleeding must come again more and more into fashion. The *pulsus magnus, durus et tardus*, which the old practitioners invariably bled, was exactly the pulse of high-pressure as we now recognise it. (Mahomed.) There can be no doubt that, in the present day, we too much neglect venesection. In cases of apoplexy, with increased vascular tension, bleeding is beneficial; and also in uræmic convulsions, which Mahomed† regards as probably due to minute cerebral hæmorrhages, produced by increased arterial tension, and not to the circulation of excess of urea or ammonium carbonate in the blood (Frerichs), or to anæmia of the brain caused by spasm of the cerebral arteries (Hughlings Jackson and George Johnson).

Some time ago, it was discovered that amyl-nitrite and nitro-glycerine have the property of relaxing the arterioles, and of thus temporarily reducing blood-pressure. This discovery affords a most beautiful instance of what I do not hesitate to call scientific therapeutics, and affords another example that medicine is advancing to the dignity of a science. The drugs I have mentioned are especially suited to those cases in which the heart fails to overcome the great arterial pressure, as, e.g., angina pectoris, and the angina-attacks occurring towards the end of chronic Bright's disease. To Dr. Brunton we are indebted for the discovery of the action of amyl-nitrite in angina pectoris. In his *Gulstonian Lectures*, delivered before the College of Physicians in 1877, he says: "Some years ago, I was placed in exceptionally favourable circumstances for studying the disease. I was able to watch a patient at every hour of the day and night, and to observe every phase of the attack. By the aid of Marey's sphygmograph, I discovered that, during the paroxysms, the blood-pressure rose and the pulse became quick. I might have imagined that the rise of the pressure was due to the quickness of the heart's pulsations; but the experiments of Marey and Chauveau enabled me to say, from the form of the tracing, what I could not have discovered by the finger, that the arterioles were excessively contracted. As the pressure rose, severe pain came on in the heart, and, when the pressure fell, the pain disappeared. It was, therefore, natural to look upon the pressure as the cause of the pain, and my opinion was confirmed by the effects of bleeding; for this lowers the pressure, and each bleeding prevented an attack. The pathology of the disease thus seemed clear; and the next question was, how to treat it? The remedy wanted was one to dilate the vessels, and this the researches of Richardson and Gamgee supplied. Nitrite of amyl they had shown to possess the very power which I desired; and thus, their experiments on the pharmacology of the drug, and my observations on the pathology of

the disease united, led to successful therapeutics. I administered the remedy, and the pain disappeared."

Nitro-glycerine has been shown by Dr. Murrell* to have the same physiological action as amyl-nitrite, and may be used in the same cases. Its effects are said to be more gradual and lasting; it may, therefore, be taken regularly three or four times a-day, and the arteries thus be kept in a constant state of relaxation.

We have now seen how the sphygmograph has not only helped to point out the nature of pathological states, but also indicated the treatment suitable for them. There can be no doubt that this subject of arterial tension† is one of the "burning" questions in medicine at the present time, and this must be my apology for having occupied so much time it placing it before you.

One other point of great importance, in reference to albuminuria and arterial tension, which must not be altogether passed over, is the so-called "Albuminuria of Adolescents", which was the subject of a paper by Dr. Moxon in the *Guy's Hospital Reports* for 1878. In those cases of albuminuria which occur in young men from the age of sixteen to twenty-two, the albumen is not always present in the urine, but intermits; it is generally, however, present in the urine at some period of the day, most frequently in that passed after breakfast. These patients are usually languid, listless, complaining of headache, are anæmic, and "generally out of condition"; but after a variable time, under the influence of tonic treatment, the albuminuria usually entirely disappears, and the patient's health is restored. Now, in these cases of albuminuria, the arterial pressure is quite normal, or low rather than high. I have seen several cases of this description amongst the undergraduates of the University and others, and it is of the utmost importance to recognise them clinically; for the prognosis in them is favourable, and the line of treatment to be adopted the very opposite of that which obtains in cases of albuminuria with high arterial tension. I am disposed to agree with Sir William Gull, that the albuminuria in these cases is due to atony of vessels and nerves. He says, that albuminuria occurs in young and growing men and boys almost as frequently as spermatorrhœa.‡

In reference to this subject, Dr. George Johnson maintains,§ "first, that this latent albuminuria—albuminuria, that is, unassociated with any other evidence of functional disorder or structural disease—may, by a careful inquiry, be traced back, in a very large proportion of cases, to some probable exciting cause; secondly, that the presence of even the smallest trace of albumen in the urine is always pathological, never physiological; and that the neglect of this indication of a pathological condition and tendency, especially such negligence as involves repeated exposure to the exciting cause, may convert a temporary and occasional into a persistent albuminuria, which, sooner or later, though it may be after many years, will result in a fatal disorganisation of the kidney."

The probable causes of such albuminuria are, in Dr. Johnson's opinion, either (1) imperfect recovery from an acute renal attack; or (2) exposure to cold and wet, especially after being overheated and fatigued by prolonged or violent exercise (common in boys at school); or (3) imprudently prolonged cold bathing; or (4) excessive consumption of animal food and of alcoholic stimulants, either separately or combined; or (5) inveterate dyspepsia in persons of strictly temperate habits; or (6) mental anxiety; and, in some cases, a combination of two or more of these causes.

There can be no doubt that, at the present time, physicians do not regard simply the presence of albumen in the urine as so serious a sign as they would have done ten years ago. The late Dr. Murchison regarded some cases of albuminuria as due to hepatic derangement. In his work on *Diseases of the Liver*, second edition, p. 573, he writes as follows. "There are, also, reasons for believing that albuminuria may be induced by hepatic derangement, independently of structural disease of the kidneys. It is now generally acknowledged that albuminuria, even when copious, and in the absence of any acute febrile disorder, does not necessarily indicate renal disease. Very often in these cases the albuminuria is intermittent or remittent, and the albumen has peculiar chemical characters; the previous addition, for example, of a few drops of mineral acid preventing to an unusual extent the subsequent coagulability by heat. Errors in diet are one of the most common causes. In some persons peculiarly constituted, temporary albuminuria is a constant result of certain articles of food, such as uncooked eggs."

* *Lancet*, 1879.

† Mr. Hamilton ("On the Effects of Increased Blood-Pressure suddenly applied to the Blood-Vessels of the Lungs", *Practitioner*, February 1880) has shown that in croupous pneumonia we have increased blood-pressure, and that the exudation of fibrin and corpuscles into the air-vesicles is due to this, and that venesection is the one sovereign remedy for this disease; whereas in catarrhal pneumonia the very opposite obtains—there is no increase of blood-tension, and bleeding is positively injurious.

‡ Note to Dr. Moxon, *Guy's Hospital Reports*, 1878, p. 238.

§ *BRITISH MEDICAL JOURNAL*, December 13th, 1879.

* *Birmingham Medical Review*, October 1879.

† On the Pathology of Uræmia and the so-called Uræmic Convulsions, *BRITISH MEDICAL JOURNAL*, July 1879.

In several instances, I have known the urine passed at night to contain albumen, often associated with lithates and a high specific gravity, whereas the morning urine was clear, of low specific gravity, and contained no albumen. Again, in certain cases of exophthalmic goitre, the urine at some hours of the day, usually after food, is loaded with albumen, whereas at others it contains none; and this state of matters may last for many months, and then completely disappear. Now it is not contended that, in all these cases, the liver is the organ primarily at fault, but certainly in some there is good reason for believing it to be so, the albuminuria being unattended by any other symptom of renal disease, being variable in quantity and sometimes absent, and the urine being of normal quantity, of high specific gravity, and habitually loaded with lithates, lithic acid, oxalates, and pigments, and there being very often cutaneous eruption, dyspepsia, and other evidence of hepatic derangement. I have met with several instances of this sort, where the patient was subject to severe attacks of what at first seemed to be hepatic colic, but where there was no jaundice, and the paroxysm was followed by a temporary, yet extraordinary, increase of lithates and albumen in the urine. Lastly, so often have I observed albuminuria associated with hepatic disorder, which has disappeared completely and permanently when this has been set to rights, that I have little doubt that we have, in the liver, a cause of albuminuria to which attention has not hitherto been sufficiently directed."

Before leaving the subject of albuminuria, I would especially invite the general practitioner in medicine to help us to solve the meaning of this intermittent appearance of an abnormal substance in one of the secretions. They have opportunities of watching cases in private from day to day, and of knowing the habits of their patients, better than a physician, who is only consulted occasionally. It is of the utmost importance that the question should be settled as to whether these forms of albuminuria are due to removable causes, such as indigestion, etc., or whether, as Dr. Dickinson would have us believe, they represent the initial stages of granular degeneration of the kidney.

ASPIRATOR.—Another instrument of precision for which we are indebted to physics is the aspirator, which has proved such a great boon to the physician and surgeon in the diagnosis and treatment of various diseases. It is not my intention to detail all the diseases in which this instrument has been found useful, as this was most admirably done by Mr. Wheelhouse, in his Address in Surgery at the Bath meeting in 1878.* I may, however, perhaps be pardoned for mentioning the great success which has attended our treatment of hydatid disease of the liver by this instrument. This disease is very prevalent in Cambridgeshire. During the eleven years I have been physician at Addenbrooke's Hospital, I have treated a considerable number of cases of this disease with the aspirator, and only one has proved unsuccessful, and this by reason of the aspirator never reaching the sac, which had thick cartilaginous walls, although three punctures were made. In a district like Cambridgeshire, we have opportunities of watching our cases better than in the large London hospitals; and in all my cases, save the one just mentioned, the cure has, so far as can be ascertained, been permanent. I am not an advocate for making a permanent opening, unless suppuration has taken place; simply contenting myself with drawing off nearly, but not quite, all the fluid. My experience does not coincide with that of my friend, Dr. John Harley,† who advocates a permanent opening, and the withdrawal of the hydatids from the cysts, and even of the parent-cyst itself. This method was tried in some of my earlier cases, but was found to have no advantages over the simpler method, and occasionally some drawbacks, such as the setting up of a pleurisy or pneumonia, which nearly carried off the patients. Before using the aspirator in cases of suspected pleuritic effusion, hepatic abscess, etc., I now almost invariably make a preliminary exploratory examination with a large hypodermic syringe, which is really a sort of miniature aspirator. I was glad to see the importance of this preliminary test recently brought more prominently before the profession in a paper by Dr. Greenfield.‡

STETHOMETER.—The stethometer invented by Dr. Ransome of Bowdon is another instrument of precision, of value in the detection of some chest-affections. Like the sphygmograph, the stethometer is not of ready application at the bedside, and has consequently not come into general use in the profession. It is capable, however, of rendering important information in some doubtful cases of lung-disease. According to Dr. Ransome, it has, in several instances, indicated traces of former lung-disease that no physical examination of other kinds could

display; hence it is certainly useful in examination for life assurance. Dr. Ransome, in a private note, informs me that he thinks stethometry of chief value in estimating the probable course of cases of phthisis and pleurisy. In the chapter on Prognosis in his book on *Stethometry*, he spoke with diffidence on this point; but he is now much more certain of the value of exact measurements in this regard.

SPECTROSCOPE.—Another instrument which promises to be of use in clinical and pathological investigations is the spectroscope, which has yielded some important results in the hands of Dr. MacMunn.* By means of this instrument, it is said we can distinguish blood from the bladder or urethra from blood from the kidney, and blood from the stomach from blood from the lungs, etc.

ELECTRICITY.—The application of electricity to the diagnosis and treatment of diseases of the nervous system has been placed upon a much more scientific basis during the last decade, chiefly owing to the labours of Althaus, Russell Reynolds, Radcliffe, Poore, and Tibbits, in this country; of Duchenne, Onimus and Legros, Cyon and Tripiër, in France; of Rosenthal, Zech, Benedict, Brenner, Erb, Meyer, and Ziemssen, in Germany; and of Beard and Rockwell, and of Hammond, in America. The researches especially of Professor Erb of Heidelberg, on the quantitative and qualitative reactions of nerves and muscles to electrical currents, which are termed the "reactions of degenerations", are of the greatest interest and value in the diagnosis and prognosis of certain pathological states.†

It is not contended for electricity that it alone is sufficient to enable us to diagnose any particular disease of the nervous system, but its reactions, when considered in conjunction with a careful consideration of a case in all its bearings, are often of valuable assistance in forming a correct view of it. Let me cite one or two examples in illustration of my meaning. A patient suffered, among other symptoms, from paralysis of the left leg. The reactions of the nerves and muscles to faradism and galvanism were normal. Now, in paralysis from brain-disease, as a general rule, the electrical reactions of muscles and nerves are normal, which is not the case in paralysis from spinal disease, or from disease of the nerves and muscles themselves. The case was diagnosed as depending upon cerebral mischief, and, at the necropsy, a tumour was discovered in the right hemisphere, in the posterior parietal region. Again, a patient has right facial paralysis. The response of the nerve to electricity is considerably diminished. This shows that the paralysis has not a central origin, but is due to cold; that the case is one of so-called rheumatic paralysis. The cases might be multiplied in which the diagnosis of a lesion respectively in the brain, spinal cord, or peripheral nerves, can be established by electrical tests.

Again, electricity is useful in helping us to diagnose diseases affecting the various structural elements which go to make up the spinal cord; but we must not place too much reliance upon it, as several of these elements may be affected at the same time, and we may have irritative as well as paralytic lesions; and this constitutes the great difficulty in the science of electro-diagnosis. Even in some of these cases, however, electricity furnishes us with valuable negative evidence. For example, if, in a case of spinal paralysis, the electrical reactions of nerve and muscle are normal, we may infer that the grey matter of the cord is not extensively affected, and the anterior cornua and roots are intact.

Electricity also assists us in distinguishing functional from organic paralyses, and is valuable in the diagnosis of paralysis from lead-poisoning.

The subject of electro-therapeutics is now assuming so much importance, and its proper application is one which involves so many technicalities, that I should hail with satisfaction the establishment of an electrical department, under the direction of a competent person, in connection with the hospitals of this country, such department being for both paying and poor patients. I feel sure the medical men resident in the neighbourhood of such hospitals would gladly send their patients to them for electrical treatment.

I have found electricity of considerable value in some cases of progressive muscular atrophy and of infantile paralysis; and there can be no doubt of its use in removing chronic facial paralysis from cold, and, in some cases, of chronic neuralgia. Faradism and galvanism are the forms in which electricity is chiefly used in the present day; but static electricity, produced by the old plate-machine, has recently been found superior to these, in certain cases of hysteria recorded by Vigouroux,‡ Dujardin-Beaumez,§ and Erlenmeyer.¶

* *The Spectroscope in Medicine.* By Charles A. MacMunn, B.A., M.D. 1880.

† Ziemssen's *Cyclopaedia*, vols. xi and xii; also Lectures by Dr. A. Hughes Bennett, *BRITISH MEDICAL JOURNAL*, January 31st, and February 14th, 1880.

‡ *Progrès Médical*, No. 8, 1879.

§ *Gazette des Hôpitaux*, Nos. 55-56, 1879.

¶ *Centralblatt für Nervenheilkunde*, Nos. 7, 14, 1879.

* The most recent achievements with the aspirator are those of emptying and washing out of pulmonary cavities by Dr. Theodore Williams, Pepper, and others.

† *St. Thomas's Hospital Reports*, new series, vol. viii.

‡ *Lancet*, November 1st, 1879.

The treatment of aortic aneurism by galvano-puncture has met with some success in the hands of Dr. John Duncan*, Dr. Simpson† of Manchester, Dr. McCall Anderson of Glasgow,‡ and others.§ I must confess I have never had the courage to try it, although I have had two or three cases under my care which might have been regarded as suitable for the operation.

METALLO- AND MAGNETO-THERAPY.—Connected with the subject of electro-therapy are the very interesting investigations of Charcot and others, on the influence of metals and magnets, on the human body in cases of hemianæsthesia. The subject is not altogether novel, as it was a belief, even amongst the ancients, that metals applied to the body exercised some influence upon the nervous system.

Metallo-therapy has, however, entered upon a new phase since, in 1848, Dr. Burq propounded the two following propositions: first: "That in certain states of the nervous system, plates of metal, placed upon the skin, have the power of altering general and special sensation and cutaneous vascular supply; and that the susceptibility of individuals to the metals generally used—gold, silver, iron, copper, zinc—varies; a patient sensitive to one metal being insensitive to another; second: that when it has been ascertained to what metal the individual is susceptible, that metal may be successfully administered internally to cure the morbid state of the nervous system."

In 1876, the Société de Biologie appointed a committee, consisting of MM. Charcot, Luys, and Dumontpallier, to investigate the alleged phenomena, which presented its first report in April of the following year. The cases selected were chiefly those of hysterical hemianæsthesia, in which the patients had lost superficial and deep common sensibility, as tested by plunging long needles into the skin of parts usually most sensitive. The senses of taste and smell were usually abolished, and there was dimness of vision, with more or less colour-blindness. The skin was paler on the affected than on the sound side; the temperature also was lower, and the muscular power less. The results of the investigation bore out in every particular Dr. Burq's assertions. The application, for ten or fifteen minutes, of a metallic plate of gold, copper, or zinc—according to the susceptibility of a patient for a particular metal—to the anæsthetic part, restored for a time sensibility in the part. At first, a sensation of heat or numbness was felt in the part, which became red and of a higher temperature. A needle-puncture caused great pain, and made blood flow freely, though previously it was with the greatest difficulty that a drop of blood could be drawn from the limb, even when the needle was thrust through it. The muscular power in the limb was also increased; and taste, smell, and sight were restored. But these effects were not permanent; by the next day, the anæsthesia, etc., had returned. One of the most curious phenomena in connection with these experiments is what has been called the "transference" of sensibility—that is, a loss of sensibility on the sound side in the parts symmetrically opposite to those in which it has been restored.

In two cases of hemianæsthesia, dependent upon organic brain-disease, the metals restored sensibility to the part affected; and the effect, instead of being transitory, as in hysterical hemianæsthesia, was permanent.

The committee reported again, in 1878, on M. Burq's second proposition: "That the external metallic aptitude being known, the same metal administered internally will determine the same results as its external application." Five cases are recorded, in which hysterical patients, sensitive to either gold or copper, recovered sensation on the internal administration of the chloride of gold and sodium, or of the binocide of copper. Very curiously, when the sensation had returned, the outward application of plates of gold or copper produced a relapse of the anæsthesia.

These experiments appear to have been conducted with every possible precaution against error or imposture; the phenomena not being produced when any other metal than the one to which the patient was susceptible was used. For instance: in a patient sensitive to copper, plates of platinum were substituted for copper without her knowledge, but no results followed; the copper being replaced, the usual phenomena ensued.

In a case of hysterical colour-blindness (achromatops), by the application of gold to the temples, the colours were restored in definite physiological order; and on the occurrence of a relapse, they were lost in the same order—a circumstance which excludes all suspicion of fraud.

Cases, similar to those reported by the French committee, have since

been published by Drs. Anderson,* Wilks,† Inglis,‡ A. Hughes Bennett,§ Professor Westphal|| of Berlin, and others, which leave little doubt as to the genuineness of the facts observed.

A satisfactory explanation of these phenomena has not yet been made. M. Burq attributed the effects of the metals to the production of superficial currents of electricity, which influence the nerves of the part; and M. Regnard has conducted some experiments which seemed to bear out this hypothesis. It has been shown, however, by Westphal|| and others, that sinapisms applied to the anæsthetic parts produce the same effects, even the "transference", as the application of metals; and hence Adler** and others think that these agents act in virtue of their power of producing mechanical irritation. Others, as Dr. W. B. Carpenter, regard these effects as due "to a sustained attention on the part of the patients" (expectant attention); but MM. Charcot and Schiff seem to have eliminated, as carefully as possible, the influence of "expectant attention" in their experiments.

"Expectant attention" may explain much, but it does not explain all in these cases. "It cannot account", as the writer of the article on Metalloscopy, in the *Birmingham Medical Review* for April 1879, justly observes, "for a patient recovering her perception of colours in exact correspondence with physiological law, as related in the second report of M. Charcot's committee. It cannot account for transference—a fact discovered by accident, to the surprise of the observers, and, we are told in one case, the horror of the patient. It cannot account for the positive and constant results of certain agencies and the negative results of others; the different effects of the different metals; of the two poles of the magnet; of the magnet with the circuit open or closed. Such facts as the permanence of anæsthesia, caused by superimposing another metal; the prevention of anæsthesia by the same means; the prevention of anæsthesia by placing another metal on the central side of the first, and the absolute powerlessness of the same metal, when placed on the distal side, are also quite opposed to the same views."

The practical outcome of these investigations is, in the hysterical cases, at present not very great. The tendency to relapse and the production of "transfer" render the prognosis gloomy. The phenomena are, however, of considerable scientific interest, and, like the cases of paradoxical temperatures, must be left partly to the physiologists†† for a rational explanation.

The restoration of sensation and also of motion by the magnet in some cases of organic origin (cerebral hæmorrhage, alcoholism, lead-poisoning) is, however, a great gain to practical medicine, and "transfer"††† is very rare in anæsthesia of organic origin.

Thus far, I have mainly endeavoured to show the advantages which have accrued to practical medicine from the use of instruments of precision, for which we are indebted to the science of physics; and perhaps I ought not to conclude without uttering a word of caution, especially to the younger amongst us, not to rely too exclusively upon the information derived from the use of these instruments, to which perhaps there is a great temptation. The knowledge with which they supply us is, on account of its accuracy, of the greatest value, and at present the advance in the recognition and treatment of disease is chiefly due to them; but we must not ignore the aids which stood our predecessors in such good stead—the information with which the physiognomy, especially of patients, furnishes us—the estimation of the nervous element in patients, and the other features of disease recognisable by our senses, which I need not here mention, but which are known to every cultivated physician, and which cannot be measured by any instruments. We must still, therefore, be contented in some measure *stare super antiquas vias*—cultivating that "tact" upon which our ancestors mainly relied.

Had time permitted, I should have attempted to show the influence exerted by an advancing physiology, and especially of what has been called experimental physiology, upon the practice of medicine.

The researches of Ferrier, Fritsch, Hitzig, and Charcot on cerebral localisation; of Charcot and Erb on spinal localisation; of Rutherford and Vidal of the action of drugs on the secretion of bile; and of Roberts of Manchester and others on the digestive ferments, and the preparation and use of artificially digested food, point out how much may be expected in the future, in other departments of our subject, from experiments conceived and conducted in

* BRITISH MEDICAL JOURNAL, Feb. 8th, 1879. † *Ibid.*, Jan. 1879.

‡ *Ibid.*, Oct. 12th, 1878.

§ *Berliner Klinische Wochenschrift*, July 29th, 1878. || *Loc. cit.*

** *The Bilateral Functions in their Relation to Metallo-Therapy* (Berlin, 1879.)

†† In connection with this, see "Observations on the Influence of an Electro-Magnet on some Phenomena of Nerve", by Dr. McKendrick (*Journal of Anatomy and Physiology*, January 1879).

††† For explanation of "transfer" in hysterical and not in organic cases, see paper by Dr. Debove, *Union Médicale*, November 1st, 1879. For an explanation of metalloscopic "transfer", see a lecture by Dr. Th. Rumpf of Dusseldorf, *Berliner Klinische Wochenschrift*, No. 30, 1879.

* BRITISH MEDICAL JOURNAL, May 20th, 1876.

† BRITISH MEDICAL JOURNAL, vol. ii, 1877.

‡ *Clinical Lectures*.

§ Ciniselli's cases, *London Medical Record*, March 5th, 1873; also report by Buquoy to the Académie de Médecine, January 21st, 1879.

the same truly scientific spirit. And, speaking on the subject of scientific medicine, I cannot but allude to the benefits which our Association especially has conferred upon this branch of study through her scientific grants, and through our most excellent JOURNAL, which, thanks to our accomplished editor, is not surpassed in this or any other country in the scientific material which its pages weekly contain. In preparing this address, I have been struck with the very great care which is taken in our JOURNAL to bring before us all that is best in modern scientific medicine.

And now, nothing remains for me but to thank this accomplished and critical audience for the forbearance with which they have listened to my feeble attempt to place before it the principal gains which have accrued, during the last ten years, to our knowledge of the nature and rational treatment of disease, through the use of instruments, in exact research.

ADDRESS IN SURGERY,

BY

TIMOTHY HOLMES, M.A., F.R.C.S.ENG.,

Surgeon and Lecturer in Surgery at St. George's Hospital.

FERGUSON AND CONSERVATIVE SURGERY—EXCISION OF THE KNEE AND OF THE HIP.

MR. PRESIDENT AND GENTLEMEN,—It is no slight honour that you have done me in preferring me to my present position; and no light task that you have imposed on me. No one can speak on the present position of surgery before an assembly of surgeons like this, without feeling doubts as to his competence for so difficult an undertaking; but to me such feelings of diffidence are unfortunately the more natural, since, in speaking of the great things achieved by the English school of surgeons in recent times, I cannot, like most of your recent orators, say *quorum pars magna fui*. I am sensible that I must talk of other men's doings more than my own, and be a critic rather than a teacher. Still, I could not refuse the honourable share you offered me in the proceedings of this meeting, however sensible of my own demerits. I owe this invitation, I suppose, to the fact that I am the oldest member of this University who holds office as a surgeon at one of the metropolitan hospitals. Now it is to me, as it must always be to all old Cambridge men, a source of deep interest, not unmixed with some touch of sadness, to come back from the struggles and labours of our busy life in London to these scenes which witnessed the joyous friendships and the unembittered rivalries of our early days. It is, indeed, with a strange mixture of feelings that I find myself speaking about questions of practical surgery in this venerable hall, where all the hopes and fears of our juvenile ambition were concentrated on the results of far different studies.

Different, however, as were the studies of the University in my time from those which occupy the practical surgeon, and small as was the attention then bestowed on natural science of any kind, I have never regretted the years which I spent here, and have always sympathised heartily with the efforts which you, sir, have so successfully made to connect the study of surgery more intimately with the University; and I rejoice in the public approval which has so unmistakably followed your exertions. There is, indeed, much in the contrast between the University as it was then and as it is now, in which a man devoted to practical pursuits may reasonably rejoice. A radical change has passed over these grand old institutions, and has, I think, infused them with fresh life and youth. Not to speak of the happy change which emancipated both the Established Church and the University from the weight of a bond that was pressing heavily upon both, and which rendered the University national instead of sectarian, we, as practical men, may rejoice in the change which has come over the studies of the University in recent years; by which, as its portals have been thrown open to the whole nation, so its energies have been extended to the whole sphere of human learning. And in this great change, the branches of knowledge on which the art of medicine is based, or with which it is connected, have been perhaps the first and the greatest gainers. Far be it from me to decry the studies which were the occupation of my youth and the delight of my maturer years; yet one cannot but admit that mathematics, classics, and philosophy—though they may be among the grandest objects of thought—embrace only a portion of the circle of knowledge; and there is no question that modern languages and literature, the physical sciences, and the applications of mathematics were

too much neglected in earlier days. All this is now reformed, or is in the way of reform. Natural science forms a portal to the degrees of the University equally with the older studies of the place; and those who are preparing themselves for a medical career can enjoy the great privilege of membership of the University with the least possible expenditure of time or money, and with the greatest advantage, as I think, to the respectability and success of their future career; and glad, indeed, am I to see that this truth is becoming more and more widely known. When I entered the profession, it was a rare thing to find a hospital surgeon who had obtained a degree at one of our old universities. This is so no longer; and for the change we are largely indebted to our present President.

Some one may say: What is this to the business of to-day? Well, sir, I think it is very pertinent to our present topic. This Address, if I am right in my view of it, has for its subject the progress of surgery; and it appears to me that one of the most fruitful sources of that progress has been, and always must be, the increasingly close connection between surgical education and the highest culture of the period. It would be a sorry day for our profession when it was thought to be falling backwards in the estimation of the "liberales" of the nation. Happily, at the present day, all the indications are in the other direction; and we have the fairest reason to hope that this great University will have its due share in the promotion of surgical as well as other science, and that an increasing number of its sons will be found among those who form the great school of British surgery.

For, indeed, British surgery is a thing to be proud of. Less philosophical, perhaps, and less dogmatic than the teachers of foreign schools, English surgeons have distinguished themselves mainly in the practical "art of healing", and particularly in devising and carrying out into practice the operative measures necessary to rescue their patients from death. Hence we see that, in English hospitals, operations are performed with habitual success, which, in some foreign cities, are considered too dangerous to be practised; and hence, also, we see that almost all the improvements in operative surgery are of English origin. I say this in no boastful spirit. It is not due, as far as I can judge, to any national superiority—still less to any greater profundity in philosophical generalisation. Just the reverse. It is due in a great measure to the fact that we have been accustomed to practise in a healthy medium; that our forefathers and ourselves have attended to the laws of health, and never allowed our hospitals to degenerate into the condition of those of some very renowned schools of surgery.*

It would not indeed, I think, be at all difficult to show that both the science and the art of surgery have made as great progress in modern days as any of the purely physical sciences, or any of the arts which are the application of those sciences to matter. The assertion seems a hazardous one, when we remember the triumphs of engineering, electricity, and so forth; yet, to us who recollect patients shrieking and struggling in the agonies of a surgical operation without anaesthetics—who remember when ovarian disease could be overlooked in one of the ladies of the Court, and when its cure was almost unheard of—when amputation was the *ultima ratio* in all serious affections of bones and joints, yet was fraught with deadly peril; and who think of the present condition of each of these great branches of surgery, it will not seem an untenable proposition. I could easily expand this theme into the topic of an address; but I doubt whether it would serve any useful purpose. I think it better to descend from these generalities, and take some special topic, in which I can illustrate what has been done with one great branch of surgery, and point out (alas! too easy) what remains to do.

I have spoken of the progress of surgery as connected with the British school and the British character. But no doubt that progress is largely based on individual peculiarities, and helped forward by individual discoveries and inventions. And I think no better topic can be found for one of these annual addresses than to celebrate the achievements of one of our predecessors—or, still better—to estimate the value of those achievements. Last year, the Association was favoured by the reader of the Address in Medicine (Dr. Hudson of Dublin) with a *résumé* and criticism of the works of Laennec, so admirably lucid, so full of practical information, as well as of literary research, that it cannot but live in the memory of all who heard or read it. Let me try to give a similar, though of course a far weaker, tribute to the memory of one who has passed from among us much more recently, who was a former President of this Association, and whose name can never be divorced from the

* I well recollect meeting the most eminent surgeon in Paris (Nélaton) a few years before his death, and his telling me that he never performed an amputation in his hospital if it could possibly be avoided, on account of the frightful mortality which attended amputations. The condition of some of the most renowned hospitals in Germany is sufficiently attested by the delight with which the antiseptic system and its results were received there.