When speaking of progress, our thoughts naturally turn to the vast strides that have been made, both in medicine and surgery—brain surgery, abdominal surgery, the ophthalmoscope, chloroform occur to us at once, and the subject is a very fascinating one, particularly to one like me, who can, alas, remember that I used to see operations performed without anæsthetics; but it is not to these, or to any particular stride in advance, that I wish to direct your attention, but to the general result, with a view to helping us to fix on the best way of making it certain that when we drop out of the race, we may be able to hand the torch over to our successors in such a condition as will enable them to carry it, bright and blazing, triumphantly to the goal; to secure this, as far as I can see at present, our chief hope depends on sanitary science, call it hygiene, State medicine, preventive medicine, which you please.

In this city of Madras, where cholera is seldom absent, the native troops are comparatively free from the disease, being protected, apparently, by the slightly superior sanitary arrangements enforced among them than exist among the natives who live around the lines and die of the disease. I remember well, when quartered during the hot weather of 1862 at Fort William, Calcutta, where, as you know, cholera is endemic, looking forward regularly to be roused up night after night by the knock of a corporal at my door to call me to some poor fellow "taken bad with cramps." Since Fort William got a good water supply, cholera has practically disappeared. I was quartered there again in the hot weather of 1879, and then only one mild case occurred.

There used to exist a prejudice against specialists, but I think it will be admitted that there is one subject in which we all ought to be specialists (if I may be pardoned the bull)—I mean, of course, in sanitary matters; and this applies more particularly to those whose work lies in India. I do not think it desirable that any of us should tilt against windmills, by running counter to habits and prejudices, but I think every one of us can, more or less, do something to further the cause, can do something to render sanitary science fashionable, which perhaps will be the surest way of spreading it. I noticed a few days ago, in the leading article of the first number of a periodical recently started in the Punjab called the *Municipal Record*, a remark which bears on this. The writer, speaking of sanitary aims, says: "To enable them to be carried out it is necessary to enlist the services and sympathies of the people themselves." The man who succeeds in making vaccination and revaccination compulsory, he who succeeds in getting a suitable Contagious Diseases Act passed and enforced, will deserve well of the country, as also will the man who induces some millionaire to found an Indian Pasteur's Institute. I only mention objects which are not Utopian, and such as we may fairly aim at and hope to see attained. I suppose there is not one of us who doubts that cholera, small-pox, rabies, etc., could be stamped out if proper sanitary measures were adopted. We must not, however, go too fast, but seek to educate public opinion up to the necessary standard. We cannot expect the progress of medicine in general or of sanitary science to be "like that of a star fulfilling its course without haste and without rest." Its progress and work, like our own, must be more fitful, at one time rapid, at another slow—like the breeze, as Mr. Hamerton, I think, likens it to—at one time at rest and hushed in calm, at another working steadily and filling the sails of ships and mills, and at intervals rising to a gale and sweeping away the mists of error and prejudice.

WOLFFIAN CYST OF THE UTERUS.—Dr. Klein of Würzburg recently discovered an interesting anomaly at a necropsy on the body of a well-nourished still-born foetus. A full account of the case is published in the *Zeitschrift für Geburtshilfe*. There was a swelling, into which the right Fallopian tube passed, at the right cornu of the uterus. On further dissection, three cavities were found in the uterus. Two represented the normal uterine cavity, divided by a thin septum which extended into the vagina. The third proved a tortuous canal which entered the right side of the uterine wall below the fundus, and extended downwards below the os externum. The two true uterine cavities resembled the normal uterine cavity of a new-born foetus, excepting that a septum was present. The canal in the uterine wall, on the other hand, consisted of a row of cystic dilatations, which communicated with each other. Dr. Klein believed that this canal was clearly the right Wolffian duct. Its course beyond the uterus to the parovarium proved this hypothesis. The double uterus indicated a failure of complete union in the lower parts of Müller's ducts.

AN ADDRESS ON THE ADVANCEMENT OF MEDICINE BY RESEARCH.

*Delivered on the Occasion of the Distribution of Prizes at
St. Mary's Hospital, July 1st, 1890.*

By SIR HENRY ROSCOE, D.C.L., LL.D., F.R.S., M.P.,
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On occasions like the present it has not infrequently been the custom for those who hold the position which I now occupy to discourse upon the importance of the profession to which you are devoting your lives, to dwell upon the high aims and self-sacrificing labours of those who practise medicine, and to instil into the minds of those entering on so noble a life-work the necessity of being true to their high calling of ameliorating the pain and suffering which each one of us is more or less called upon to bear. To-day I do not propose to enter upon these important, though somewhat trite, themes, but rather to indicate some few of the directions in which purely scientific research is influencing—I might almost say revolutionising—the practice of surgery and of medicine. I wish to emphasise the dependence of the healing art on scientific principles, and to show that advance in the power of mitigating the ills to which flesh is heir comes as surely from a knowledge of the chemistry and physics of the body in health and disease as any advance in industrial pursuits comes from a knowledge of the science upon which such pursuits are based.

Hitherto we must admit that the practice of medicine has lacked a truly scientific basis. An enormous mass of valuable information has doubtless been collected, the power of diagnosis has in many directions reached an almost marvellous degree of precision, but if we ask the why and the wherefore we find ourselves unable to reply to the most fundamental questions. Nor is this condition of things to be wondered at. It is only as yesterday in the history of mankind that our knowledge of the simplest of natural phenomena has become more than empirical. Are we then to be astonished if the far more complicated phenomena of life and death are as yet ill understood? But now, we stand on the threshold of better things, the dawn of a clearer light begins to break in upon us. The researches of chemists and physicists during the last hundred years have given firm ground upon which to build our superstructure of physiology and pathology, and by the help of these sciences to establish a rational system of medical practice, by which I mean one based on scientific knowledge and not on empiric treatment varying from day to day according to no definite law.

Watching the progress of medical practice from a distance, and speaking with due deference to those whose knowledge is more intimate than my own, I venture to think that this progress, both what has been and what has to come, may be ascribed to three discoveries. The first is the use of anæsthetics, with which the name of Simpson will ever be associated; the second is the foundation of the science of bacteriology by that greatest of living experimentalists, Pasteur; the third is the foundation of antiseptic surgery, which we shall always connect with the name of Lister.

No discoveries of modern times have exerted so powerful an influence on the practice of medicine as that of the action of anæsthetics and the recognition of the part played by microbic life in health and disease. Without chloroform or its equivalent, on the one hand, and without antiseptics on the other, the almost astounding results of modern surgery would be impossible, whilst the revelations of experimental bacteriology have laid the foundation of scientific and preventive medicine. Bacteriological research points to the causes of, and even suggests remedies for, diseases of which the origin has been unknown, and whose cure or attempted cure has hitherto been based upon a purely empirical treatment.

Chloroform and antiseptics have given to the surgeon almost unlimited powers, whilst the use of the microscope and the sterilised tube mark a new era in the practice of medicine. And these discoveries, the application of which are so much influencing the practice of your profession, were made without reference to or

knowledge of that application. When Liebig discovered chloroform by acting upon alcohol with bleaching powder, he little dreamt that this sweet smelling liquid would become one of the greatest blessings ever vouchsafed to suffering humanity. When Pasteur proved the existence of microbic life pervading air and water, he worked with no view to useful application, but with a pure love for unravelling Nature's secrets. He had no idea that the investigation of these atmospheric floating germs, these motes dancing in the sunbeam, would lead to the discovery not only of the causes of epidemic diseases but of the means of their prevention. But so it is in scientific research. The first link in the chain may be the apparently unimportant preparation of some abstruse chemical compound with a long name and a longer formula, or the investigation of an apparently equally unimportant question as to whether minute germs exist in the air or not. The last link in the chain is the manufacture of this hitherto unknown compound by thousands of tons, for the use of man as a powerful new medicine or as a useful dye; or the discovery that these germs are the cause of typhoid, cholera, or hydrophobia, and that by avoiding their entrance into the body the specific disease which they create is warded off. Surely results like these must convince even the most obtuse as to the importance of encouraging scientific research.

Here in London we have no lack of the raw material in the number of active and intelligent men who each year pass through our metropolitan schools. But little comes of it, and the reason is not far to seek. Many scores of men whilst waiting, as most have to do, for practice, would gladly work at some original research were the means to enable them to do so placed in their hands. The mass of young qualified men cannot afford this luxury; they have to earn their bread, often without much butter, and original work does not pay. Nothing would, in my opinion, do more to raise the status of English medicine than the foundation of research scholarships of moderate amount to be given to the various medical schools in London. Make the conditions as stringent as you please, but give an opportunity to men having knowledge and ambition, and with time on their hands to do original work. A liberal beginning in this direction has been made by the Scientific Grants Committee of the British Medical Association, and the results are so far most encouraging, but this is only a beginning. Why cannot the great medical corporate bodies turn their attention to this pressing necessity? How can they spend their funds better—or, indeed, so well—as by thus encouraging original work? Is this not one of their first duties—to assist in widening the boundaries of their sciences, and have they taken any steps in this direction more than the formation of one or two lectureships? The foundation of the laboratories on the Victoria Embankment is indeed a recognition of this study, but unless these laboratories are filled with workers their existence is of but little use, whilst if some such inducement as that I have indicated be held out to students, valuable results are sure to accrue. Are the medical authorities satisfied with the present state of things? I fear that this may be to some extent the case, and that the introduction of what may be termed new fangled ideas and proposals does not meet with much sympathy. And yet the world moves on; those that do not go forward will be left behind, and this is true of the nation as well as of the individual. English medicine has much to be proud of in its inheritance and in its present position; let it take care that in the future it sustains the high level of its past. This will certainly not be the case if original scientific work be ignored or neglected.

But it may be urged if our young medical men are to bury themselves in original research they will cease to be practical, and lose their grip upon ordinary clinical work, and thus fail in their profession. To this conclusion I demur. Research does not unfit, but rather prepares men for attacking the problems of everyday life. Besides, no one expects all medical students to be original researchers; only a few are fit for it, and only those few care for it. The mass will go on as their forefathers have gone, and become doubtless valuable and respected members of society, though innocent of any original conception. For those who have the talent and ambition to shine in another and a higher sphere some provision should be made, and it need not be much, for such work brings its own reward in the delight which it affords.

I remember well one day in Paris the great chemist, Dumas, talking to me after dinner at his own house over a cigar of his career. "I have," said he, "seen every phase of life—student, teacher, professor, minister, senator, but no work that I have been called upon to perform has been so satisfactory, or is looked back

upon with such pleasure, as that of carrying on original work; and, if I had to live my life over again, I would not relinquish my quiet laboratory pursuits for all the splendour and influence of Court favour, or the turmoil and rewards of political life."

Depend upon it Dumas was right. There is no pleasure more unalloyed than that derived from honest original work. One new scientific fact satisfactorily established is worth a pound of theory, and the pleasure of ascertaining this is one open to all. And then the fascination of discovery! Fact is stranger than fiction. What can be more fascinating or stranger than what we now know about vaccination? Up to a few years ago the great Jennerian discovery stood alone, an unexampled and unexplained phenomenon. Now we know that it is only the first of a long series of similar phenomena, and we are on the high road to their explanation.

I will not detain you now with an account of what has been done to develop our knowledge of preventive medicine. This has been brought before you in a masterly way by my friend, Dr. Maguire, in his inaugural lecture last year. I will refer to one point only arising out of the remarkable discoveries of Metschnikoff, supplemented by those of Dr. Ruffer and others on the same lines. It has been known for some time that infectious diseases are caused by the presence of pathogenic micro-organisms in the tissues of the animal, and Pasteur has shown that an inoculation by an attenuated form of the germ renders the animal proof against the toxic effect of a subsequent invasion. Moreover, it has been long known that an animal having recovered from an infectious disease is not again subject to an attack of the same malady, and also that a given microbe may prove fatal to a given species of animal whilst it does not affect another species. Metschnikoff's investigations have gone some way to explain these remarkable facts. He has shown that certain cells of the animal body, termed phagocytes, identical with the well-known white blood corpuscles, being endowed with the power of independent motion, not only wander inside but also outside the tissue, and, *mirabile dictu*, pursue, devour, and digest any stray bacilli, whether pathogenic or otherwise, with which they come into contact. This is the true battle for life which, hitherto unknown and unobserved, is going on uninterruptedly within the animal body. These phagocytes are the watchful guardians of the body, upon whose action its health depends. You may observe their proceedings for yourselves under the microscope; you will see them fighting against the invading host and literally swallowing them up. Poisonous bacilli are constantly present in the body. Pasteur's septic vibrio is always present in the intestines of the rabbit, but cannot pass through into the blood. Those causing diphtheria or pneumonia have been met with in the mouths of healthy men, and yet no entrance of such microbes into the blood takes place. Why is this? Because these phagocytes pursue and annihilate them before they can gain an entrance, and to them might be applied Cæsar's message, "*Veni, vidi, vici*."

Stranger still is the story which has to be told about vaccination and the extraordinary power of resistance to microbic attack which vaccinated animals exhibit. This power resides in these germ-eating cells; so long as their activity continues, the animal is freed from evil effects, and vaccination confers on these cells their power of attack. In the case of an animal which is not vaccinated, or if it belongs to a species which does not normally possess this power of resistance, the wandering cells either do not attack the invading army of parasites at all, or only destroy them partially. In that case these parasites pass into the system, and destroy life either by the mechanical lesions which they produce, or more usually by the poison which they secrete. This, as I have said, is no fancy picture, but a true struggle for existence, which you may follow in its various phases if you take the trouble to do so. It is surely a subject well worthy of study, and one of absorbing interest, now only in its infancy, towards the elucidation of which there is ample room for all observers.

The question as to the way in which these pathogenic microbes act on the animal organism is one which touches chemical ground. As I have said, every micro-organism during its growth secretes a poison which appears to be a specific one for each microbe. So far as we are aware, these poisons are definite chemical compounds possessing distinct properties, and doubtless, also, a definite, though probably a very complicated, constitution. They are allied to the poisonous compounds termed ptomaines, which have been isolated from putrid flesh and other sources. Two of these ptomaines have been prepared artificially from simple organic com-

pounds, and these are identical with putrescine and cadaverine. Chemically these bodies are related to the amines of herring brine, and they are very poisonous.

In the case of certain well-known micro-organisms we have been long acquainted with the special poisons which they secrete. The yeast plant yields alcohol, carbonic acid, and other products; the vinegar plant turns alcohol into acetic acid, and in many other examples each organism during its life forms a special product. In less well-known instances we may therefore conclude that the same thing holds good—indeed, the existence of soluble poison capable of inducing the disease has been proved in the case of the diphtheritic bacillus; and it appears that it is these chemical bodies, rather than the micro-organisms, which act as the preventive to further infection in the case of inoculation. What a vista of new research does this open out to the chemist, as well as to the physician! To the former it holds out the prospect of the investigation of a new and most interesting class of bodies; to the latter it points the way to the discovery of the causes of disease, and thus to that of its prevention.

But we are only on the threshold of our knowledge of these things. Neither the chemist nor the physiologist is able to explain the anæsthetic effects of chloroform any more than the remarkable, but well attested, phenomena of hypnotism. And in like manner we are unable to state the conditions under which the phagocytes of the lungs or of the tonsils are able, on the one hand, to seize upon and destroy the invading hosts of pathogenic bacilli, or, on the other, fail to prevent their entrance, and cease to keep the guard upon which the health of the body depends.

And now, gentlemen, I have detained you long enough. If you ask for a moral to my story, it will be this: Uphold the dignity of your profession in every direction, but do not forget to honour that which makes for enlarging the boundaries of science. Do all that in you lies to assist in this development. Remember that whilst it is given to few to place the corner stone on the edifice, the work of giving a helping hand is open to all. If you succeed in making even the smallest addition to our stock of knowledge, believe me, the gratification which you will feel will amply repay the trouble you have taken or sacrifice you have made.

AN ADDRESS

ON

THE SURGICAL TREATMENT OF IMPASSABLE STRICTURE; WHEELHOUSE'S OPERATION; ANTISEPTIC INTERMITTENT IRRIGATION.

Delivered at the Annual Meeting of the Southern Branch.

By JOHN WARD COUSINS, M.D.LOND., F.R.C.S.,

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IMPERMEABLE stricture of the urethra is a rare disorder, which has often taxed the ingenuity and patience of many eminent surgeons, and in days gone by has called forth many heroic and hazardous methods for its relief.

Surrounded as we are in the South of England by a large seafaring population, we have abundant opportunities of treating many varieties of stricture in the wards of the hospital, and sometimes the most severe forms of the disease come under our observation. Occasionally genuine cases of impermeable stricture fall into our hands—cases in which no guide or bougie of any kind can be introduced along the urethra into the bladder, and under this condition operative interference has long been regarded as essentially difficult and tedious.

Some authors have dogmatically asserted that, if urine can be discharged through the canal, it ought to be possible by skill and perseverance for an instrument of some kind to be introduced through the stricture into the bladder. This statement, however, does not correspond with my experience. In some cases I have found the urethra to be absolutely impermeable to instruments, although the urine has been discharged in a tiny and tortuous stream. Fortunately, impassable strictures are comparatively rare in the present day, and we must be always ready to take every precaution to avoid mistake. It is the bounden duty of the surgeon to see that no case is relegated to this unfortunate class

until all treatment has fairly failed, and many earnest efforts have been made to penetrate the contraction.

Treatment of Old-standing Stricture Demands Caution.—All cases of chronic and obstinate stricture must be regarded as dangerous disorders; but with an impassable stricture the patient is ever exposed to the risk of many terrible complications, and with the highway to the bladder practically obliterated. If renal symptoms are present and the nutrition of the body seriously impaired no operation, however slight, can be considered as absolutely free from danger, and the cautious surgeon will make a careful selection of his cases and thus avoid bringing his well-intentioned efforts to a sudden and disastrous issue. The constitutional condition of the patient always demands very special consideration, and the state of the urine must receive careful investigation. It is essential to estimate the average amount of urea contained in the secretion, for in every case the danger of surgical treatment is in direct proportion to the extent of the renal degeneration. The existence of serious inadequacy must, even during an emergency, put a restriction upon our efforts and limit us to the performance of such proceedings as are absolutely necessary for tiding over the difficulty. In the course of my hospital practice I have seen many patients, who had been living for years a loathsome existence from chronic stricture, suddenly fall into a comatose condition and rapidly succumb. Not long ago an old sailor was placed in one of my beds suffering from chronic retention and fetid cystitis, associated with long-standing stricture. He looked very ill and micturition was extremely painful and frequent. It was impossible to wash out the bladder, and, therefore, after introducing a fine guide through the urethra, I performed median cystotomy. Unfortunately the weakened renal system would not bear the shock of this little operation, and in a very few days he suddenly fell into a state of collapse. After death the walls of the bladder were found much thickened, and the ureters and pelves of the kidneys converted into accessory receptacles and distended with fetid secretion. The kidneys were large and soft and in the substance of both organs there were many cysts.

Operations for the Relief of Impassable Stricture.—The old operation of perineal section without a guide is performed by cutting down upon the dilated portion of the urethra above the stricture, and then cautiously dividing the contracted part of the canal. The patient having been placed in the lithotomy position, and a staff passed down to the stricture, an incision is made in the central raphe of the perineum about an inch in front of the anus. The edge of the knife is then turned forwards, and the point thrust towards the apex of the prostate, so as to penetrate the dilated portion of the urethra behind the stricture. The contraction is then divided as far as the point of the staff, and a full-sized instrument is passed into the bladder over the urethral orget. This method of performing external urethrotomy by opening the dilated portion of the urethra above the stricture is seldom practised except in some cases of retention, in which the canal is in a specially favourable state for incision. Under any conditions it is a difficult proceeding, and it is my practice to relieve first of all the retention by simple perineal incision or aspiration above the pubes, and then to reserve the treatment of the stricture for a subsequent effort.

Wheelhouse's Method.—Some years since, the present President of our splendid and world-wide organisation (Mr. Wheelhouse) introduced a new form of perineal section for cases of impassable stricture, and his ingenious operation has now rightly superseded all the old heroic and dangerous dodges of finding a way into the bladder without a guide.¹ The patient having been placed in the lithotomy position, the urethra is opened by a clean incision, about a third of an inch above the stricture, upon a straight staff, which has a very small beak on the opposite side to the groove. The canal is then stretched open with forceps, which are carefully held by assistants, and at the same time the apex of the incision is hooked up by rotating the staff and projecting the blunt little hook into the wound. In this way the incision into the urethra is widely expanded, and the operator looks into it in front of the stricture, and searches for the distal orifice with a fine probe or pointed director. By careful manipulation the true passage is sure to be found. Sometimes the opening is hidden in a tiny fold, or buried in a crop of granulations, but the free movement of the point of the instrument is always a sure guide to the operator that it has entered the stricture and is going on in the right direction. The contracted part of the canal must now be care-

¹ JOURNAL, June 24th, 1876.