Lydgate, in that wonderful novel. He succeeded, not because of his "conviction that the medical profession as it might be was the finest in the world, presenting the most perfect interchange between science and art, offering the most direct alliance between intellectual conquest and the social good," but because "he cared not only for 'cases,' but for John and Elizabeth, especially Elizabeth." It was by no means uncommon to hear patients speak of one of the most successful physicians of our time in this way: "I don't think he is so very clever; indeed, I think he must be overrated; but he exactly understands my case. He takes a great interest in me." Some people thought this was only clever acting, almost dishonest. I disagree with them entirely. I believe it was simple genuine good nature—kindly feeling, a desire to be useful, a pleasure in doing good, such as most men feel and all may cultivate. Pray do this, all of you. You are not playing with chessmen nor a *Kriegspiel*. You are influencing for good or for evil your own fellow-men, the men who make the nation, the men whose wounds you may heal, whose sufferings you may shorten, whose life you may prolong. And who can tell where the influence for good of any one of you may reach? You drop a pebble into a smooth lake, and it disappears; but from that centre widening circles radiate, and, gently stirring the water-plants on the surface and the grass along the banks, give them renewed life and motion. So may all true work—at first, perhaps, thrown away, lost, or forgotten, or begun under difficulty—be continued with increasing effect and in wider circles, and the good not ended when the workman's own course is finished, and his efforts to make men healthier, happier, and better, have earned for him the esteem of his fellow-workmen. Then he may be able, after years of anxious toil, whether he has achieved or only deserved success, to say with truth, "I have fought the good fight."

Thirteen years ago I spoke hopefully of the future. Those hopes have been more than justified. I spoke of the education of the men who were to practise medicine. I said we must so order our schemes of education that our students should have the advantage of the highest culture to be obtained by an English gentleman. I could then only speak of the essentials of a chartered university as already existing in Manchester. Now the Victoria University has obtained its charter, and it must not fail in the race with Oxford, Cambridge, London, or any other university. They are strong competitors, but there is nothing so good for a man or an institution as the competition of strong worthy rivals. You will not beat them easily, but it will do you good to try. And to all associated with the Victoria University or Owens College let me say, in conclusion, that a review of your past augurs well for the future. The new session is opening with increasing numbers under happy auspices. "The little that has been done seems nothing when we look forward and see how much we have yet to do" (Goethe). Learn and try to do it well. "Not failure, but low aim, is crime" (Lowell). And believe me that upon your work, your knowledge, and your sympathy will largely depend your own happiness and that of all within your influence. Act in George Herbert's spirit: "Acquit thee bravely, play the man"—should we not say the gentleman? for "he is gentle who does gentle deeds" (Chaucer)—and so acting be sure that—

If thou do ill, the joy fades, not the pains;
If well, the pain doth fade, the joy remains.

MEDICAL BEQUESTS.—Mr. Andrew Pickard, of Ossett, near Dewsbury, has, by his will, bequeathed £1,000 each to the Leeds Infirmary, the Wakefield Infirmary, the Dewsbury Infirmary, Royal Albert Asylum for Idiots, Lancaster, and sums of £250 each to the following: Yorkshire College; Hospital for Women and Children, Leeds; Blind, Deaf and Dumb Institution, Leeds.

LAPAROTOMY FOR PERFORATION IN TYPHOID.—In the *Sei-I-Kwai Medical Journal* for April, Dr. S. Kimura, a surgeon in the Japanese navy, records a case in which he performed laparotomy for perforating typhoid ulcer. The patient was a man aged 34. The operation was done twenty-eight hours after the occurrence of perforation, when the patient was collapsed and almost moribund. The perforation in the small intestine, about two inches above the cæcum, was of the size of a small pea. The perforated part of the intestine was turned inward, and ten interrupted Lambert sutures applied. The abdominal cavity was washed out with a warm solution of dilute boracic acid, and dried with a sponge; a large gum elastic tube was introduced, and the wound stitched up and dressed antiseptically. The patient was "cheerful" for a little time, but died about nine hours and a half after the operation.

ON THE CLINICAL SIDE OF MEDICAL EDUCATION.

Delivered at the Opening of the Session of the Medical Department of the Yorkshire College, Victoria University, Leeds.

By W. H. BROADBENT, M.D.,

Physician to St. Mary's Hospital.

The Modern System of Medical Education.—The Five Years' Curriculum.—The Uses of Lectures.—The Physical Signs and the Physiognomy of Disease.—Clinical Clerks.—"Better or Worse."—Examinations and Examiners.—Need for a Court of Appeal.—The University of London.—A New University for London.—General Practitioners.—Chemical Research in Physiology and Pathology.

LADIES AND GENTLEMEN,—I appear here to-day in obedience to an invitation from the teaching staff of the medical department of the Yorkshire College, which presented itself to my mind as an imperative command. They have thought that I might be able to instruct or advise or encourage the students whom they have to train for the medical profession, and, although I am painfully conscious that I have little to say which has not been better said a thousand times, I could not refuse, as a physician who has had some experience in teaching, and as a Yorkshireman, to do my best.

When medicine was a faculty of a few great universities, the occasions of the opening of the session were attended with formalities amounting almost to pomp. Then, as in accordance with the practical genius of this country, each great hospital became a medical school, the session was opened by an introductory lecture; one of the teachers was selected to address the students, to direct them in what order they should take their studies, to point out the relative importance of the various subjects, and to explain the facilities offered by the particular institution, inciting them as best he could to diligence. Naturally, as such lectures were delivered year by year at a dozen different schools, there was much repetition, and it had, moreover, become the practice to give much of the information formerly conveyed by the lecture in the form of calendars and prospectuses. Even the subject of medical education was worn almost threadbare, and could only be dealt with profitably and endowed with new interest by exceptional men like Dr. Clifford Allbutt, who gave at St. George's Hospital last year the result of experience gathered here. All kinds of questions have been eagerly seized upon for discussion—medical politics, the grievances of the medical officers in the public services, the social position of the profession, and the means by which medical men might acquire greater influence in the State and greater consideration in the world, the services rendered by the profession, the progress of medical science, till not infrequently the idea of giving a lecture to students as such, and especially to new students, was frankly abandoned, and the orator addressed himself *urbi et orbi* on the latest discoveries in science, or on some subject which he had himself worked out. Finally, at many hospitals the introductory lecture has been entirely given up; the students stray into the school in a casual way, make the acquaintance of their teachers by accident; there is no welcome of any sort for them, and absolutely nothing to mark what is for them one of the most important epochs in their lives. I confess I am glad my reception into the ranks of aspirants to the medical profession was not of this cold fashion.

The practice of inviting an outsider to give the introductory lecture, which has prevailed here for many years, certainly has its advantages, especially from the point of view of the teaching staff, who thereby elude a constantly-increasing difficulty. But I must add that if they lay their burden on us who take their place, we bear in mind that it is an honour which they confer upon us, and personally I feel it to be a great honour to follow in the footsteps of such men as Professor Gairdner, Mr. Jonathan Hutchinson, and others who have occupied this position in previous years.

My colleagues for the time being offered me the fullest liberty in the choice of subject, and it would perhaps have been easier for me to bring before you some question which I may have studied; but I have many opportunities of approaching the profession and the public, few of meeting students at the outset of their career, of appealing to the enthusiasm which lies latent in the breasts of the young, of expressing my sympathy with them, of placing my experience at their service. It is a safe thing, I think, to argue from my feelings to theirs. It has been humorously said that there is a great deal of human nature in man, and if human nature in all its moods has so little changed in the course of thousands of years, that we find true pictures of ourselves in that oldest and best of books, I cannot be wrong in assuming that on the benches before me there are hearts beating with the same excitement, and minds full of the same aspirations as my own when I attended my first introductory.

You will forgive me, therefore, ladies and gentlemen outside the ranks of the students, if I now forget you and address myself directly to them. You no doubt have felt, as I have, profound emotion as you have watched the surplined stream of undergraduates flow out from a college chapel, and have been moved by intense excitement as a regiment has marched past on its way to war. Perhaps the occasion does not appeal to the imagination in the same way; these young men are not going forth to face the hardships of a campaign or the dangers of battle, and it is not likely that among them there is a potential Minister of State, on whose action the welfare of nations may depend; but our sympathies are always awakened when we contemplate a number of young people at the outset of their career, and it is by no means impossible that some of those before us may add to the lustre of the Leeds School of Medicine, may make discoveries in therapeutics which will benefit humanity generally, or may achieve a reputation which will make this day memorable; and it is certain that most of them will, in their day, hold in their hands, under Providence, the issues of life and death, the welfare and happiness of families.

And now, my young friends, what can I say that will be helpful to you? When I think of the responsibilities attending the practice of medicine or surgery, and think again of the amount and variety of knowledge required to enable a man to solve the complicated problems presented by disease; when I reflect that after more than thirty years of more or less continuous work I find that I have still much to learn, I am tempted to exclaim "Who is sufficient for these things?" Even more am I ready to say this when I think what tremendous claims are made on the mental and moral character, what clearness of insight and soundness of judgment, what courage and self-confidence in decision, what promptitude of action, and, again, what devotion and self-sacrifice are required. I have sometimes felt anxious in my mind as to the competence of our students when they go out in the world at the end of their four or five years in school and hospital; but, on the other hand, I am every year astonished by the real knowledge acquired by young men during the brief period in which they are under my own observation, and one of the greatest interests of my life is to watch the rapid development of the clinical faculties in the hospital wards. Meeting old students again after they have left the hospital for a few years I have been astonished to see the maturity of judgment and the confidence in treatment which had been developed by the responsibilities of practice and by having been brought face to face with disease, and having had to wrestle with it alone. The foundations of medical knowledge had evidently been properly laid; and it is, after all, only the groundwork of the profession of medicine which can be set out and consolidated at the medical school and hospital.

I spoke just now of four or five years of instruction in school and hospital, but it is only comparatively recently that this length of time has been required. Formerly men passed the College and Hall after not more than two and a half or three years of study with one examination only at the end of this period for each qualification, and yet again and again have I met in consultation practitioners who have had no other teaching or examination than this, at whose feet I felt I ought to sit and learn, instead of pretending to direct the treatment of the case to which I had been called. Let me mention two men of this stamp whose names stand out in my memory, the late Michael Foster, of Huntingdon, and the late Thomas Clarke, of Huddersfield. I am not so certain then that the policy of insisting on a minimum of five years, which is now almost decided upon, is a sound one. By all means let those who can do so spend five or six years or more in the acquirement of scientific knowledge bearing

on disease from every point. Some must do this if medicine is to advance, but I doubt if it is necessary that all should spend five years at school and hospital, and if the imposition of this period is not necessary it is wrong. It is said that the profession is becoming overstocked, and that some means must be taken to keep down the numbers entering it. This may be, but a money test, such as this is, is not the kind of check that I approve of.

I am taking it for granted that you are all seriously intent on fitting yourselves for what is to be your life's work. I am not here to talk to men whose sole idea of attendance at school and hospital is to get their schedules signed and of qualifying for the medical profession to scramble through the examinations. But, assuming that you are full of the best intentions, I do not think it will be altogether useless if I urge you to set to work at once, and to hard work. When you first enter examinations look a long way off, the distractions around you are numerous and powerful; you are making new acquaintances and forming new friendships, the number and variety of the studies you are called upon to take up at first perplex you, and you feel disposed to wait till you are more at home with them and your new surroundings before you settle down to regular and systematic reading; but you really have not an hour to spare, and you ought without loss of time to see your dean or tutor, learn all you can about the teaching arrangements, and enter upon serious work in conformity with them. It is the fashion at present to decry lectures, but I will venture to say that there are very few courses of lectures which do not teach more than is found in books, and very few men who will not find something to learn from lectures after most careful reading up. The subject is a living one in the lecturer's mind, and it will be set forth with more *nuances* and greater emphasis of the important points than is possible in print; but if you want really to profit by a lecture, you must already have read up the subject so that it is familiar to your minds. This is a recommendation to which I attach great importance.

But I shall probably be of most use to you in speaking about your work in the wards of the hospital. There is a very natural tendency on the part of students to suppose that the main purpose of ward work is to acquire a knowledge of physical signs, and no doubt this is a most important object of study and practice. It may, however, be pursued too exclusively. While skill in eliciting and interpreting physical signs is necessary, familiarity with the physiognomy of disease is also absolutely essential, and will, indeed, be more useful to you and your patients than that you should be good auscultators. Sometimes the look of a patient tells you his whole story; you know he has phthisis, or bronchitis, or heart disease, or kidney disease, or cancer, or pernicious anæmia before you have asked him a question. You come to a bedside, and you may read in the face of the sufferer typhoid fever, or pneumonia, or acute rheumatism; and you may read more than this—you may say to yourself he will do well or badly, he will succumb without an effort, or he will make a good fight for his life. When pulse, and temperature, and physical signs, and urine have told you all they can, you may see by the expression of the countenance that there is something behind which makes for good or evil. Knowledge of this kind cannot be conveyed in books or imparted by a teacher. It is by the eye that you have to be guided when a case first comes before you, and you can see how important it is to have at once a clue to the nature of the malady. Books and lecturers can, it is true, tell you what to look for, but you must look for yourselves, and from the moment you enter the hospital you should make it an object to fix in your minds the indications of disease apparent in the face. You should say to yourselves when you first see a case, "Now, what is the matter with this man?" and every time you see him later you should ask yourselves, "Does he look better or worse?" When you are in practice you will have to answer this question both to yourself and friends every day, and the confidence you inspire (and, indeed, your own usefulness) will depend greatly on the promptitude and justice of your answers. Perhaps the most valuable feature in the old apprenticeship system, now dead and buried, was that observation of a patient's appearance and attention to what he said about himself were enforced. If the developmental theory were applied to medical education, and it were necessary, as in the development of the body, to pass through all the embryonic stages by which medicine has been evolved, something like an apprenticeship would be an early phase of the evolution.

Carried into the region of physical signs, the habit of noticing carefully every point which can be made out by vision is a gain

of great value. Deficient movement of one side of the chest, or flattening, or retraction, or bulging of a part, becomes at once a guide in the further examination, and often furnishes the interpretation of evidence elicited by percussion and auscultation. The position and character of the apex beat of the heart and of the right ventricle impulse will often be found to give information of greater value than that afforded by a murmur; these points are, indeed, essential to the appreciation of the full significance of a murmur.

While speaking of physical signs, let me say by way of parenthesis that in affections of the lungs it is always well to examine the sound side fully and carefully first, if you know which it is. There are such differences in the normal percussion note of different chests, and especially such differences in the character of the respiratory murmur, that we must establish a standard of comparison in each case; and, again, a respiratory murmur in excess of the normal may at once cast suspicion on the other lung or on another part of the same lung. One word more in continuation of this parenthesis. In auscultation, whether of lungs or heart—but especially of lungs—it is not only what we hear that is important but what we do not hear. A deficient entry of air may be as significant as tubular breathing, and the absence of heart sounds may be far more serious than a murmur.

But I will suppose that you are acting as clinical clerks. The use you make of this opportunity is all-important. Of course your notes are taken on a system; you set down the family and personal history and the history of the illness which has brought the patient to the hospital. I think it is well to preface all this by a few words stating on what grounds or for what prominent symptoms he has sought admission. Next will come the present condition, when, after an account of the general state of the patient—his aspect, colour, decubitus, temperature, skin, etc.—the state of the digestive, circulatory, respiratory, urinary, and other systems is described in order. Now, much the most important part of this record is the general description of the patient, and, according as you get a complete picture of the case down on paper, you are likely to have one in your minds. Then the digestive, circulatory, respiratory, and other symptoms, which you describe systematically later, will fall into their proper place and take their proper proportions. A disadvantage of this detailed description system by system—which is absolutely necessary as a matter of training—is that indications which all point in the same direction and afford a mutual corroboration are dislocated from each other, as, for example, the dusky countenance and blue nails, the distended jugulars, the irregular pulse, the distressed breathing, the enlarged liver and the high-coloured, turbid, and albuminous urine of heart disease will find themselves separated, perhaps, by a page or two of your full report, and yet they all mean the same thing. Unless you bring them together in your general account of the case there is some risk of your failing to see their combined significance.

Then, when you come to physical signs, it will conduce to clearness of comprehension if from the first you distinguish between facts of observation and the inferences based upon them. You have no business, for instance, to put down in your notes that a systolic mitral murmur is present. What you ought to do is to say that a murmur of a certain character and duration associated with a given phase of the heart's action is audible over a certain area, and conducted in a given direction, and that it accompanies or follows, or modifies, or extinguishes the first sound. This is what you observe, and it is all you know of your own knowledge in the first instance. That the murmur has its origin at the mitral orifice, and that it signifies regurgitation is an inference supplied by the knowledge and experience of your teachers. You accept it from them, but you must think it out for yourselves—why the murmur is heard at the apex, and what exactly is taking place. Then, again, if you have simply made a note of a mitral murmur, you will rest satisfied day by day with this same statement, whereas the murmur may be undergoing changes of character and intensity which may have the greatest possible significance, and may tell of increasing or diminishing interference with the functional efficiency of the heart, and of a rallying or failing ventricle. You should examine the patient day by day as if you had never seen him before, and set down your observation without reference to what you have written previously. You will probably find now and then that you have contradicted yourselves flatly. I should be disappointed if you did not. No lesson can be more useful.

When you come to examine the lungs, this caution is still more necessary; the terminology of pulmonary auscultatory phenomena is in a very confused condition, and with the exception, perhaps, of tubular breathing, fine and coarse crepitation and sibilus, there is scarcely any name which has not been used in more than one sense. The terms "moist sounds" and "harsh breathing," which have crept into use, are specially exasperating; harsh breathing may mean anything from puerile respiration to a sonorous rhonchus or cavernous respiration, and moist sounds anything you please. The word "moist" seems to connote fluid in the tubes or air vesicles and free expectoration, but moist sounds are often conspicuous by their absence when secretion and expectoration are most copious. As you listen over the lungs, ask yourself, first, Is air entering freely and normally, and have the inspiratory and expiratory murmurs their normal relative duration and intensity? If there are adventitious sounds, are they present in inspiration or expiration, or both? Are they produced in the large or medium-sized or smallest tubes, or in the air sacs? Are they produced where they are heard or conducted to this spot? Are they compatible with integrity of the lung structure, or do they signify consolidation or cavitation? Of course you will take into account the evidence yielded by percussion, and note carefully the mobility of the part of the chest under examination in making your final inference as to the condition of the lung. The sputa, again, will often furnish important information, and are sometimes conclusive of the diagnosis; the quantity, colour, viscosity and character of the expectoration must always be taken into the considerations recorded.

In your subsequent visits to the bedside the first thing to be noted is, "Does the patient look and feel better or worse?" and "Is he better or worse?" I am moved to make special mention of this, because I have gone over scores of clinical records in which I should not have known at the end whether the patient had died or had left the hospital well but for a final entry to one effect or the other. After a statement of the progress will come, of course, an account of the physical signs and others matters.

Another thing that I would urge upon you is that you should make a copy, or at least an abstract, of each case to be kept for your own use: you cannot think how useful this will be to you now, or how interesting later. Unconsciously the patients under your charge, as clinical clerks, become to you types to which all your lives you will refer cases for comparison, and when you recur to your notes or abstracts your impressions are revived in a surprising way.

One more recommendation. You should read up thoroughly in your textbook at the time the diseases which your cases illustrate. Nothing in the course of your work can be more profitable than this. It fixes in your minds the symptoms attending the particular affection, not only by way of object lesson, but because there are always some points in which the course of disease departs from the generalised and averaged account which can alone be given in books, and the want of correspondence between what you read and what you see will challenge your attention and impress your memory.

This last piece of advice will serve you well in examinations, too. If one thing goes further than another with examiners it is an obvious practical familiarity with disease, and when you are answering from cases which you have in your mind's eye rather than from books, this is at once recognised.

I may, perhaps, say a word or two on the subject of examinations—examinations being naturally of very great interest to you, not, perhaps, unmingled with apprehension. It ought to be the case that, in fitting yourselves efficiently for your future work as members of the medical profession, you were making the best possible preparation for examinations.

This is, in effect, the theory of all examining boards, but, through the imperfections of human nature—from which unfortunately neither examiners nor examinees are altogether free—it does not always hold good in practice. Some students cannot express themselves in writing, others cannot put their ideas clearly in spoken words, and there are men, good men too, whose mind and memory and understanding become a perfect blank in the presence of an examiner. But there are also examiners and examinees, and a student will pass or fail at the same examination, according as he encounters one or another of those who conduct it. All examiners will admit that their duty is not to find out what the candidate does not know, but to ascertain what he does know, and almost all whom I have known endeavour seriously to act up

to this idea, but there are men who are entirely destitute of the faculty of eliciting knowledge, others whose questions are obscure, others whose aspect strikes terror into the unfortunate student's mind. I have been told that I myself look stern, not to say fierce, when I am examining, although I can assure you my intentions have always been of the most benevolent character. Others, again, it is said, cannot deny themselves the pleasure of sarcasm at the expense of the defenceless wretch before them, or love to lure him on to his destruction by an approving smile when he is going wrong. I am bound to add that personally I have never known an instance of the two last named.

Perhaps an adventure of my own at the College of Surgeons may amuse you. When I went up the examination was *vidæ voce* only, and lasted just an hour, a quarter of an hour at each of four tables. At three I had got on pretty well, when at the fourth I was questioned on the subject of psoas abscess. In those benighted days the treatment recommended was gradual evacuation by small valvular punctures, and it so happened that I had had an apparently successful case in the practice of the gentleman to whom I was apprenticed. I described this method therefore, upon which I was asked, somewhat sharply, if I had ever seen a case so treated; and when I replied yes, if I had ever seen one get well? Again I said yes, upon which my examiner said "I don't believe you." To the next question I made no answer, and when it was repeated I still remained silent. The examiner now got angry; I was already so, and leaning back in my chair I said that as he doubted my word I did not propose to answer any more of his questions. I do not remember the details of the scene which ensued, but I recollect well that I derived much comfort and encouragement from the fact that the colleague of my adversary got up from the table and walked to the window looking over Lincoln's Inn Fields, where I could see his sides shaking with laughter. Fortunately for me I was saved by the other three tables.

From some cause or other it happens now and then that, to the anger and disgust of teachers, the very best men are rejected. Now this ought to be impossible, and I have no hesitation in saying that failures occasionally take place which cast discredit upon the examination and the examiners. I think there ought to be a court of appeal, to which, on the unanimous demand of the lecturers of a school, any such occurrence might be referred, and I would visit severely on examiners any unjustifiable rejection. This should specially be the case at the conjoint examination of the two Colleges, at which a pass or pluck is almost a matter of life or death to the candidate.

Although the Yorkshire College is specially associated with the Victoria University, some of you may perhaps be preparing for the London University. You are aware, no doubt, that the scheme for transforming this University into a so-called teaching university for London has for the present broken down. I cannot say that I am surprised at this result, or that I greatly regret it. The idea of adapting the London University to the requirements put forward in the name of this teaching university for London always looked to me rather like an attempt to square the circle. The University of London has come to exercise imperial functions; not only do its graduates come from India and all the colonies, as well as from all parts of the kingdom, but colleges in these distant regions are affiliated with it and schools shape their educational methods in conformity with its schedules, and I do not see how it can now be made to subserve merely local purposes.

To medical education the London University has rendered most important service by the high standard of its examinations, and if it has gone on the principle of looking only at results, without inquiring closely into methods of training, it has influenced these methods by its requirements, and especially by giving weight and prominence from the first to a clinical examination in the wards of some hospital. But the medical degrees of the London University have never been attainable by a man of average abilities and average diligence with only average time and means at his disposal. To obtain the London M.D. either superior intellect or exceptional industry, or a more protracted course of study, has hitherto been necessary, and I do not see how this degree is to maintain its character and, at the same time, to be made available for the legitimate demands of the London schools and the London students, which is that a course of training and a thoroughness of examination, admitted to be in all respects on a level with the education and examination which elsewhere—say at Edinburgh, or Glasgow, or Dublin—confer the title of doctor of medicine shall have this effect in London, that is, that a degree shall be obtain-

able by the average student. A prodigious amount of time and thought and discussion has been expended on the scheme for modifying the London University, and I not think this will be found to have been wasted. Clear ideas have been arrived at as to the constitution and working of a teaching university for London and as to its relations with the medical schools and with the two Colleges, and I am very much mistaken if a scheme is not worked out and carried into effect during the tenure of office of the energetic President of the Royal College of Physicians, Sir Andrew Clark, which, while satisfying the requirements of the medical profession, will organise the educational institutions of the metropolis.

Let the University of London maintain the existing high standard of its degrees, reorganising itself from within by the combined efforts of Convocation and Senate, in accordance with the results of the discussions which have long been going on in and between these bodies, and adjusting itself to the new educational conditions which it has itself done so much to bring about. Let it, above all, be set free from the paralysing subordination to the Treasury which has hitherto crippled its development. Let another university of different constitution and with different aims arise by its side, and let the result be worked out. If the mission of the London University has been fulfilled and it no longer meets a want, it will gradually decline in numbers and influence. If, on the other hand, it still has imperial functions and continues to wield a world-wide influence, there will be room for both.

But, to return to the subject of greatest interest to you all yourselves, the most critical period of your lives will be that which immediately follows upon your examinations, determining the sphere and character of your labours and position.

Some of you will before that be marked out by ability and force of character for a place on the staff of the school and hospital; some will probably go into special lines, such as lunacy and public health, but most of you will enter the ranks of the general practitioners. Now I would not have you suppose that the position of the general practitioner is to be regarded as one of inferiority. Taking it all round, in usefulness, in happiness, in enjoyment of life, in early security of position, in the probability of health and strength and prosperity of children, I think he has the advantage over the consulting physician or surgeon. It is only the sustaining power of scientific enthusiasm and love of work for the work's sake which can carry a man through the weary years of waiting which the consultant has to expect; ambition pure and simple is entirely out of place in our profession; we have no adequate reward for this passion, and it conflicts with the very idea of our motive principle, which is to devote our lives to the good of others. Then, moreover, it is not the case that the best of the students become attached to the hospital, and only the second-rate go out into general practice. The very pick of the school will often deliberately prefer general practice to hospital appointments, and it is well that this should be so. I shall never forget a saying of Sir James Paget. We were talking about a young man who had impressed us both by his ability and clearness of judgment, and Sir James asked me what he was going to do. I said I thought he would shortly be appointed to the surgical staff of his hospital. "Oh!" he replied, "he is too good for that; he is the kind of man we want in general practice." And there are problems of causation of disease, of its intimate nature, of its inheritance, which can only be worked out by the family medical man.

Still, there cannot fail to be some here who have the instinct and faculty of research, who are burning with desire to penetrate into the mysteries which surround the nature and processes of disease and the mode of operation of remedies. To you I would say that the turn of chemistry has come. On the elucidation of the problems of nervo-muscular action have been expended the most acute thought and refined ingenuity, instruments of marvellous complexity and delicacy have been invented, which display every phase of the reactions between nerve and muscle, and the insight obtained into the processes concerned is most wonderful.

Every phase, again, of cell growth and cell activity seems to have been laid bare by the high powers of modern microscopes, aided by the various methods of staining. But we must carry the inquiry further back. The evolution of motor power and of nerve energy is a chemical process just as much as is the evolution of heat by combustion, and the growth and activity of cells take place in obedience to forces which are the outcome of chemical changes. We want to know exactly what these processes and changes are. In vegetable organisms luminous vibrations shake

loose the carbon and hydrogen from the oxygen of carbonic acid and water, and, setting a great part of the oxygen free, bring about new conditions under which the mutual affinities of carbon, hydrogen, and oxygen build up, under the guidance of the vegetable cells, complex organic matters. What form of force takes the place of light in the animal organism? And in virtue of what modification or perversion of this force is the initial change of inflammation, which precedes and causes the capillary congestion and corpuscular migration, substituted for normal nutrition?

We want to know, again, what is the chemical change in the cells of the cerebral cortex which accompanies the registration of a sensation or the emission of a motor impulse. I cannot but think that as regards this we are on the eve of discovery. If the action of substances which affect the nervous system definitely and powerfully is chemically dynamic—and such must be the case—then there exists a chemical relation between these substances and the constituent of nerve cells through which nerve energy is stored up and liberated. The establishment and explanation of this relation would give us the mode of action of this class of poisons and remedies. The mode of action of remedies is the great desideratum of medicine, and a knowledge of it would at once bring therapeutics into the circle of the experimental sciences.

Now, if you do not work hard at chemistry when you first enter upon your medical studies, and master the principles of this science thoroughly, the opportunity is lost. You will soon be left hopelessly behind, and can neither contribute to the great result to which I look forward, nor even appreciate it when it is attained.

In pathology chemistry has also a great part to play. Already the researches on ptomaines and the poisonous albumoses which are generated by bacteria have begun to bear fruit in practical medicine. Nothing as a rule can be more mischievous in practice or more prejudicial to the progress of medicine than the premature application of theoretical principles or scientific discoveries; witness the vagaries of iatro-mechanical and iatro-chemical therapeutics and the terrible results of the doctrines of Brown and Broussais based on the science of the day. Quite recently we have seen Koch's discovery of the tubercle bacillus annihilate, for some minds, the experience of centuries with regard to phthisis. This disease at once became highly contagious, and predisposition to it a figment of the imagination, while the treatment resolved itself into antiseptic inhalations, and, when these became discredited by observation, their place was taken by injections of sulphuretted hydrogen into the rectum. The tubercle bacillus undoubtedly exists. It is the active agent in pulmonary consumption and other tubercular diseases, and the knowledge that such is the case has enlightened us as to the true nature of the processes which constitute these affections, and is of the utmost importance both in prevention and treatment; but the facts of observation remain and must be taken into account. The truth is that all of us swallow and breathe tubercle bacilli and crowds of other morbid bacteria every day of our lives; but only those who from local or general weakness offer a vulnerable point to these organisms fall victims.

So much by way of warning against the tendency to jump to the conclusion that ptomaines, as the last new discovery, explain everything, and are the chief things to be borne in mind in treatment; after which I may venture to give an instance in which a knowledge of their poisonous effects was of real use. The case was one of typhoid fever, which I saw with a friend of mine (Dr. Ford Anderson), at about the fourteenth day of the disease, in the early part of 1889. The initial symptoms had been fairly characteristic, but the temperature ranged low. There was no distension of the abdomen, and the bowels were constipated, while there was extreme prostration and constant vomiting of small quantities of greenish liquid. An eminent physician had twice seen the patient, and had given a diagnosis of acute tuberculosis with, of course, the gravest possible prognosis; but at the time of my visit typhoid fever was written unmistakably on his face; and I should add this had been Dr. Fred. Anderson's opinion throughout. The prognosis, however, was hardly less serious. The patient was so weak that he could not turn in bed, and the nervous prostration so great that he could answer no questions, but could only remonstrate piteously, "I am so weary." The pulse was very frequent and extremely small, short, and weak. The hands, moreover, were swollen, cold, and livid, so that the pulse could scarcely be felt; the feet and knees also were cold and clammy. I had seen such

cases before, and they had always proved fatal; this, to all appearance, would be no exception. It was obvious that the nervous system was overwhelmed by some poison; and here came in the recently-acquired knowledge of ptomaines. Formerly, it was supposed that the poison was in the blood, and was probably formed there; now we have been taught that poisons are manufactured by bacteria in the intestine and absorbed. Clearly the patient's one chance was that the bacteria and their products should be swept from the alimentary canal, and that, if possible, the microbes should be killed. Fortunately, the intestinal lesions, which in typhoid fever constitute so great a part of the danger, could here be disregarded; there was no local tenderness, no abdominal distension, no intestinal catarrh. We gave, therefore, three grains of calomel as best serving the double purpose we had in view. Already next day the patient was relieved, the coldness of the extremities and the swelling of the hands had gone, the pulse was stronger, the aspect was better, and instead of the feeble plaint of weariness, he asked how much longer he would have to lie in bed. After another dose of calomel, followed up by grey powder, the case resolved itself into a mild form of enteric fever, with the usual spots, which pursued a normal course and ended in recovery.

I could relate other cases almost equally striking in which the recognition of ptomaines production in the intestinal canal explained obscure and dangerous symptoms, and was the clue to effectual treatment, but a single instance suffices to show how advances in chemical knowledge give precision and vigour to our therapeutic efforts.

And now one final word. The honour of the profession is in the hands of each succeeding generation of medical students. It stands now perhaps higher than at any other time. How is it to be maintained and advanced? Not simply by new scientific discoveries and increasing efficiency, but by the education and character of individual members. Let no one abuse the power and opportunities which his position as a medical man gives him; let no one be tempted by the desire for success or coerced by pressure of adverse circumstances into unworthy practices, such as undermining or underselling his neighbours; do nothing which is inconsistent with true self-respect; but even this is an imperfect safeguard, and it is only when conduct and motives are referred to guidance outside ourselves and higher than we can be sure of doing what is right towards our patients and our profession.

ABSTRACTS.

ST. GEORGE'S HOSPITAL.

ON THE EVOLUTION OF MEDICINE.

THE Introductory Address was delivered on October 1st, by Mr. AUGUSTUS WINTERBOTTOM, Dental Surgeon to the Hospital and Lecturer on Dental Surgery. He began his address with a general greeting to all present "as fellow students," and continued with a short explanatory preface of the lecturer's object in endeavouring to interest his audience in a historical sketch, the subject of which was the Evolution of Medicine and Surgery as a Science up to the Founding of the First English College, and the Evolution of St. George's Hospital as a School; but, before dealing with this matter, Mr. Winterbottom referred to changes and reforms which had taken place at St. George's Hospital during the past year, and laid strong emphasis upon the value of that reform which duplicated the staff of house-physicians and house-surgeons. He contended that it offered the possibility of an "all-round" advantage, and said: "To the students—and I place what is to their benefit in front, because the welfare of the sick is dependent upon the early training of those who attend them—the advantages are difficult to over-estimate. They can gain in supervision, in careful direction, in particular clinical study and instruction, and in opportunity for individual experience and research. To the residential staff all these advantages should be even more distinctly emphasised and apparent. To those who seek relief from our hospital the benefits are not merely prospective. The weary waiting in the out-patient room will be immediately relieved, and the business-like phrase, 'continue as before,' after a moment's interview, can be supplemented by some words of encouragement. The in-patient can feel less nervous about questioning the resident