INTRODUCTORY LECTURE ON THE INFLUENCE OF HUMAN PROGRESS ON MEDICAL EDUCATION.

*Delivered at the Royal Victoria Hospital, Netley, on commencing the
Twenty-fourth Session of the Army Medical School,
April 1st, 1872.**

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It is proverbially difficult to make a beginning. Indeed, "the difficulty of the first address, on any new occasion, is felt by every man in his transactions with the world, and confessed by the settled and regular forms of salutation which necessity has introduced into all languages."

Twice each year these seats are filled by new comers; and, on such occasions, it has become the custom to address to them words of salutation and of welcome. And although such words may be thus often repeated, I would not have you regard them as mere words of course. It is especially to-day a source of great pleasure, and an earnest of future usefulness and efficiency, to see here for the first time the candidates for each of the three branches of the Queen's Medical Service brought together under one roof—to see the British, the Indian, and the Naval Medical Services represented here. Such an amalgamation means progress and strength.

There are a few, also, amongst the candidates of the Indian service to whom our words of salutation and of welcome are more especially due: I mean those natives of India who, having left the land of their birth to reside for years amongst strangers (one of the greatest sacrifices which a native of the East can make), have manfully overcome the many prejudices to which they were born, and have learned in this land of freedom and of education the principles of a noble profession, the practice of which cannot fail to advance the interests of civilisation and of human progress in their native land. It is our desire, therefore, that they, as strangers, may find a special welcome at Netley.

It has also sometimes been the custom in the first address of the session to introduce the candidates to the nature of their duties, and to tell them of the high official trust and grave responsibilities which it will be their privilege to assume and their duty to discharge. But I do not now mean to trespass in these respects on the province of my colleagues, who will severally, as they meet you, introduce you to your respective duties, and define the special work you will be required to do here. I would rather engage your attention with a subject which I hope may be congenial to our first meeting together.

Casting about for some such topic, I have thought it might not be without interest if I attempt to contrast the past with the present, so as to unfold the social conditions which have contributed to improve the education of medical men and to advance the science of medicine—conditions which will continue to demand and to exact of our profession still greater general and scientific acquirements; or, more briefly stated, I would consider the influence of "*Human Progress on Medical Education*."

Looking to the methods of instruction that have prevailed in our science, there are at least *three* which may be regarded as each characteristic of different periods of time. During the earliest period, the medical man was believed to be born a doctor. He was looked upon as a congenital physician—a physician by hereditary transmission. Hippocrates is an example. He is described as the seventeenth or nineteenth in lineal succession from Æsculapius, the reputed founder of the science of medicine. But the most recent instance of such a type of doctor is one whom Lady Mary Wortley Montague describes, and who attended her in a dangerous illness. Of him she writes, "that he will not employ a surgeon or an apothecary. He performs surgical operations with great dexterity; and whatever compounds he gives he makes in his own house, which are very few, the juice of herbs and water being commonly his sole prescriptions. He has very little learning, and professes to draw all his knowledge from experience, which he possesses perhaps in a greater degree than any other mortal, being the seventh doctor of his family in a direct line. His forefathers have all left journals and registers, solely for the use of their posterity, none of them having ever published anything; and he has recourse on every difficult case to those manuscripts, of which the veracity at least is un-

questionable." (*Letters from Italy*.) Now, without prejudice or disrespect to the memory of Æsculapius and Hippocrates, this stamp of a "doctor" has been improved off the face of the civilised world, by the processes, no doubt, of education, of natural selection, and the struggle for existence.

The next period may be recognised as the "apprenticeship period", when men passed into the profession by a desultory kind of apprenticeship—nominally of seven years' duration—and then "walked the hospitals", picking up scraps of medical lore and practical knowledge as best they could. Such were the characteristics of medical education up to within sixty years ago. There was then no regular or uniform professional course of study in medicine, or, indeed, in any profession. In such a method of training, the practice went before theory; and there can be no question that many following this plan rose to high scientific positions and lucrative practices, whose names are now famous. Such will continue to be the case with whatever education; some will always rise superior in spite of adverse circumstances.

Up to 1822, and within fifty years ago, there was no such thing as clinical instruction in the education required for our profession. Clinical instruction, commencing in Edinburgh, extended thence to London, where the force of public opinion, and competition among rival schools, caused this method of teaching medicine and surgery to be first adopted with success by Elliotson, Watson, Brodie, and Earle—names which are well known, and which will be ever held in high repute in the annals of medical education. Dissections of the human body were, at the same time, very rarely attempted; and it was not till 1832, when "the Anatomy Act" was passed, that such dissections were legalised. Natural history and botany were similarly neglected. Chemistry was but little studied; and practical instruction in it was far too expensive (even twenty years ago) for its being so learned in a laboratory by the generality of medical students. The requirements for degrees in medicine fifty years ago were also greatly less in number than they are now; and, with the exception of Edinburgh, Glasgow, and Aberdeen, there was no University in this country where a complete course of medical instruction could be obtained capable of qualifying for a degree, and where such a degree could be obtained.

One of our most illustrious poets—Thomas Campbell—(no doubt rejoicing in the *Pleasures of Hope*) has the merit, in 1825, of proposing (in a letter to Lord Brougham) the institution of the London University, which now exacts the highest education in all branches of Arts and Science, and confers the highest University honours on men of all beliefs and of all sects.

The next and present period may be regarded as "The Lecturing Period," commencing in 1815, when the Society of Apothecaries instituted systematic courses of lectures upon chemistry, botany, anatomy and physiology, medicine and surgery—two, or even three, of these subjects being taught by one and the same lecturer. Now, any one of these subjects is found enough for one man to teach. Since that year—1815—the time devoted to lectures has gradually increased; so that now, an everlasting attendance on *systematic courses* of lectures is demanded from the student. Every school—metropolitan or provincial—however small may be the hospital, must have a complete staff of lecturers. This is a condition of compulsory education which at present calls for rectification; and a reaction must inevitably take place. There is now too much lecturing—as opposed to tutorial instruction—and of *compulsory attendance on systematic lectures*.

Nevertheless, a greatly improved and extended system of *practical* medical instruction in *tutorial classes* now obtains than heretofore. Practical anatomy, morbid anatomy, and pathology, are zealously prosecuted; natural history, botany, natural philosophy or physics, and practical chemistry, are now necessary parts of medical education; but these latter branches of science ought to be preliminary to purely professional study. They *must* come to be so when education, pertaining to the daily work of life, becomes more diffused in elementary schools. Clinical instruction is now universal, as regards *schools*, but is not yet sufficiently universal as regards *students*. The courses of such clinical instruction require to be extended, so as to give a greater *length of time* to the tutorial instruction of individual students; and to embrace more of them, for longer periods, in the practical work. Apprenticeships have been practically abolished; the field of medical education has been greatly extended, and the subjects arranged in graduated stages of progress, with intermediate examinations from one stage to another. The final pass-examinations for degrees and licences are now made as practical as possible by a bedside examination in surgery and medicine.

But, while the *field* of medical education has been thus extended, and is still extending, the *time* for acquiring such professional instruction ought to be extended also. This will no doubt be done; and I would also rejoice to see but one gateway to the profession in place of nineteen; one central examining body; one examination, as uniform as possible,

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through which all must pass in order to receive a licence simply qualifying them for "general practice", with as many teaching bodies as choose to establish themselves or can find a reason for their existence; leaving university degrees and the honours of corporate bodies (which are a mystery to the general public) to be taken by those who desire to possess them, and who value them for what they may be worth.

What has led to these many and great improvements in medical education, by which you are presumed to have profited so much compared with your predecessors of fifty years ago? These improvements are doubtless due to the irresistible and sure, but often imperceptible, march of human progress,* and to the not less powerful influence of public opinion.

With the advance and improvement of general education throughout the country, the responsibilities of the medical man in civil, military, and naval life, have greatly increased, and are still increasing; the office of the physician has been promoted; the aim of the science of medicine has been extended to the prevention as well as to the cure of disease; and the practice of the art of medicine has become greatly more difficult. But "difficulty is a condition of success, a severe instructor to wrestle with, which strengthens our minds and sharpens our skill. Such an antagonist becomes our helper, obliging us to acquire a more intimate acquaintance with our work and duty" (Burke). The light of increasing knowledge has shown how many difficulties surround the science and the practice of our art, compelling us from time to time to reconsider in all their relations the aims and objects of the science of medicine. That science is now found to require a better education, a greater compass and energy of mind, for its efficient prosecution than heretofore; because the physician works in a much wider field. He also uses many more physical aids in detecting diseases and in determining their causes; and, therefore, he has more numerous and more delicate instruments and methods of investigation to learn the use of than the physician of fifty years ago. There never was a time when greater necessity existed than now for strengthening the judgment by the discipline of a more lengthened clinical and practically technical instruction, in what will be the future daily duties of the "general practitioner" in civil life, and of "the army and navy surgeon".

Under the influence, then, of a better and of a greatly more extended field of education than men ever had when similarly situated, you commence here at Netley a life-long competition, in which the man who continues to educate himself the best is sure to come to the front.

[After demonstrating his thesis by a reference to the marvellous progress of civilisation during the last fifty years, the lecturer continued.]

But you may ask, In what respect does this exposition concern you and the members of our profession? This rapid glance at human progress during comparatively only a few years, shows that we, as a profession, must advance and keep pace with the time; for the strongest incentive to work exists in the spirit of the time in which we live. Not only is knowledge power in these days, but the want of knowledge is practically a degradation. When science is not only rapidly extending her discoveries, but is revealing herself still more extensively to those classes in the community where she was unknown before, few will be content to live in the ignorance of their forefathers, more especially while the requirements of the age exact a wider range of knowledge from the individual members of every profession than formerly.

The education of the medical man, whether he be destined for civil, military, or naval life, must bear a relation, not only to the amount of professional knowledge he requires for his special work, but to the requirements and attainments of the existing state of society in civil life, or of the society of the particular community among whom he is to work—such, for example, as that of the officers of the army and the navy in relation to you.

Two questions, therefore, at once suggest themselves for consideration. The first is: Have medical education and medical science kept pace with the diffusion of instruction and the progress of general education in the civil community, as well as with the preliminary and scientific training of other professions during the past fifty years? I venture to think that they may fairly be said to have done so; but every energy is required to maintain our position and to keep pace with the progressive and rapid development of the other sciences, with the spread of education throughout the country, and with the inevitable "tendency towards perfection and amelioration of the individual condition". While there is obviously now a very marked desire to give even the most elementary instruction a direct bearing on the actual concerns and work of life—while a special technical education in all kinds of work is called forth by the temper and feelings of this and other countries—medical education must be no exception in adapting itself to the requirements

of the age in which we live. Medical education is now called upon to possess the double characteristic of *comprehensiveness* and of *practical usefulness*—of comprehensiveness much greater than at any former time, and of practical usefulness in devising means for the prevention of diseases and the promotion of sanitary science.

The extension of physiological laboratories, as at Edinburgh (which in this country took the lead in this direction), and which are now in active work in University College and King's College in London, will greatly contribute to this comprehensiveness and usefulness, by teaching exhaustive and systematic methods of exact research in questions of vital physics, somewhat similar to those carried on in the laboratories of Germany. At Guy's Hospital, St. Thomas's Hospital, and St. Bartholomew's, similar opportunities for work are in contemplation; the object being in all to afford more practical methods of teaching and learning methods of investigation concerned in the science of medicine. It is a new movement, and one which is certain to make great progress. It seems to me as the kind of work which rightly takes the place of apprenticeship, and which will teach far more useful practical work than the best and most favourably situated apprentice ever learned.

It is by such technical education in all sciences that advances are being made amongst all classes, in all professions, and in all directions. It is by the extension and the efficiency of such education that the place of this and other countries will be determined in the society of nations. Skilled labour and technical knowledge push forward and come to the front; unskilled labour and practical incapacity will inevitably be left behind to idle out an unprofitable existence—which tends, in fact, to individual extermination.

As regards our own profession, it is in the extension of clinical instruction in hospital wards, and in the extension of practical technical education, such as obtains in physiological laboratories, microscopic rooms, and such like practical work in connection with hospitals, with extension of time for work and study, that future improvements in medical education must lie. But at the same time there is abundant evidence to show that medical science and medical education have advanced, and are advancing, with the time. Especially it is to be noticed that there is more of exact diagnosis, and, therefore, more intelligent and efficient management of diseases; that there is a more intimate knowledge of the causes of some diseases, and, therefore, more certain knowledge taught as to the means for their prevention; that there are wider views taken of the principles of the science of medicine, and more direct and careful methods of investigation, than at any former time. Our science, therefore, is advancing, and, I believe, it will continue to advance with a progress far beyond our present imperfect means of calculation.*

Time, however, does not permit me to name merely the many improvements in medical science which have taken place during the past fifty years, or to state the relations in which they stand to other sciences. To name them merely would not give a fair representation of them. It would do our science an injustice, because they can only be fairly appreciated when regarded in relation to the whole science of medicine and to each other. The medical science of to-day is as widely different from that of fifty years ago as any science can be. Let it be sufficient to say that the details of improvements in practical medicine are very important and very numerous, even as they are set forth in our text-books of medicine.

But, while medical science has not been behind the advance of other sciences—and a review of the achievements of medicine which have been made in living memory cannot fail to rouse a spirit of emulation in the most indifferent; and, while it must ever be held "as one of the

* On this point, Mr. W. E. H. Lecky, in his most interesting and learned *History of European Morals*, hazards the following forecast; namely, that "Of all the great branches of human knowledge, medicine is that in which the accomplished results are most obviously imperfect and provisional, in which the field of unrealised possibilities is most extensive, and from which, if the human mind were directed to it, as it has been during the past century to industrial inventions, and especially to overcoming space, the most splendid results might be expected. Our almost absolute ignorance of the cause of some of the most fatal diseases, and the empirical nature of nearly all our best medical treatment, have been often recognised. The medicine of inhalation is still in its infancy, and yet it is by inhalation that Nature produces most of her diseases, and effects most of her cures. The medical powers of electricity, which of all known agencies bears most resemblance to life, are almost unexplored. The discovery of anaesthetics has in our own day opened out a field of inestimable importance, and the proved possibility, under certain physical conditions, of governing by external suggestions the whole current of the feelings and emotions, may possibly contribute yet further to the alleviation of suffering, and perhaps to that euthanasia which Bacon proposed to physicians as an end of their art. But, in the eyes both of the philanthropist and of the philosopher, the greatest of all results to be expected in this, or perhaps any other field, are, I conceive, to be looked for in the study of the relations between our physical and our moral natures. He who raises moral pathology to a science, expanding, systematising, and applying many fragmentary observations that have been already made, will probably take a place among the master intellects of mankind." (Vol. i, p. 166.)

* "In every experimental science there is a tendency towards perfection. In every human being there is a wish to ameliorate his own condition." (Macaulay, *History of England*, chap. 111, vol. i, p. 279.)

glories of our profession, that all the great discoveries, which have for their object the *prevention* of disease, have been made by medical men"; we must, on the other hand, regard with feelings of deep regret that the practical application of these important discoveries throughout the country lags very far behind, from no fault of the science of medicine or of the physician.

There has been more than a passive obstruction (which still prevails) to arrangements (suggested by knowledge) which aim at preserving health, by removing from the vicinity of man those influences which artificially curtail his life; those external poisons which embitter and abridge his existence—influences which bring about the greatest calamities of mortality; when opening buds are blighted; when life is cut off in the full bloom of usefulness, in the midst of happiness, affection, and esteem.

These results of preventable disease, alike in the highest and in the lowest ranks of life, furnish the most desolate spots in human progress; standing out waste and arid in the midst of healthy enjoyment and usefulness, when the happiest prospects are defeated, and joy is engulfed in the deepest depths of sorrow.

It is the aim, it is not less the ambition, and it is in the power, of the science of medicine, to mitigate and to prevent such results; but ignorance, apathy, prejudice, and vested personal interests, have hitherto stood in the way of that efficient legislation which alone can give the power to carry out the means of preventing disease amongst the civil population.* For these reasons, the fruits of sanitary science have been little in civil life, compared with what they have been in the army and navy. The reductions in the mortality of the troops at different stations during the past ten years, when compared with the two decennial periods embraced from 1817 to 1836, are almost incredible. In the Windward and Leeward commands, for example, from 1817 to 1836, the mortality ranged in different years between 43 and 169 per 1,000 men. During the past ten years, the range has been reduced to between 5 and 29 per 1,000 men. In Jamaica, the range of mortality, formerly between 61 and 307 per 1,000 men, has been reduced to between 7 and 71. In Gibraltar, a range of between 8 and 128 has been reduced to between 4 and 24. The average death-rate also, in places notoriously unhealthy, has been greatly reduced during each decade of observation. Thus, Jamaica, from an average of 128 deaths per 1,000, was brought down to 40, and now stands at 26 per 1,000; St. Helena, from 25 per 1,000, was reduced to 12, and now stands at 9 per 1,000. Ceylon, from 74 per 1,000, was reduced to 38, and now stands at 24 per 1,000. In India, the improvements are simply marvellous.

Surely in such examples we have sufficient evidence that disease may be prevented.

But, while it seems clear that the medical man has to do, both in civil and in military life, with a class of minds much better educated than formerly, yet, as regards questions of State Medicine, and of sanitary science, and of the knowledge of their own bodies, the greatest ignorance still prevails amongst all ranks of life; and, just as statesmen say that the franchise cannot be extended and the representation of the people improved till they are better educated; so, sanitary improvements in civil life, for the same reason, are likely to remain in abeyance, till primary education shall teach that some of the greatest social evils are traceable to physical agencies, capable of removal by proper means.

Still further evidence of medical education being coequal with the

times is to be seen in the large class of "general practitioners" of medicine, who, by sound and extensive professional acquirements and general accomplishments, exercise a great and increasing influence all over the country; and another item of evidence exists in the rise of numerous provincial schools of medicine, which successfully compete with medical education in the metropolitan schools, as shown by the success of their pupils at pass-examinations. While the "general practitioner" thus takes his place in civil life, and finds his level or asserts his influence just in proportion to his scientific education, professional acquirements, social accomplishments, and refinements, how is it likely to be with the military and naval medical officer?

This brings me to the second question; namely, What are the relative acquirements of those with whom it will be your lot to associate in your daily life, and your duty to hold important and responsible professional intercourse in the services?

[The lecturer here referred to the higher education required of both officers and men in the army and navy, and continued.]

There can be no doubt, therefore, that the characteristic of the army and navy of the future, in every rank and arm of the service, is intended to be represented by an *educated man*; and the medical officer of both services, in order to maintain his individual dignity and professional status, cannot afford to be behind or inferior in education and attainments to those with whom he must daily associate. The Rev. Canon Kingsley, in a recent address at the Royal Artillery Institution, Woolwich, expressed a similar belief as to the officer of the future; namely, "that the finest type of civilised man we are likely to see for some generations to come will be produced by a combination of the truly military with the truly scientific man."

From this imperfect glance around the educational and scientific horizon of the day, and looking to the position which the army medical officer is destined to hold as a necessary element in the economy of an army and a fleet, officered by men of high educational attainments, it behoves you to qualify yourselves by every opportunity for gaining knowledge and technical skill, so as to maintain your status in your respective services with benefit to the country, with satisfaction to your superiors, and with credit to that profession to which you have the honour to belong. It is to help you to do this that you find yourselves here. It is in accordance with the spirit of the time that you have come to this hospital and practical medical school to acquire a technical knowledge of your special duties in the army and in the navy; for your professional services will in future be valued, not so much by your skill in curing diseases, but in proportion as you know how to prevent men from becoming ill and requiring to be cured. You will, therefore, acquire here a technical education in duties having for their object the prevention of disease and the management of the medical affairs of armies and of fleets. In the acquisition of such instruction, your period of probation here will stand to you in the relation of an apprenticeship to your future work in the services.

Such a course of instruction did not exist till within the past twelve years. It has arisen entirely out of the wants and necessities of the age; and, if I have been successful in showing how the education of our profession is improving and is still to be improved; if I have correctly indicated the social events which have contributed to these improvements; if I have fairly appreciated the cotemporary circumstances, which of necessity are exacting, and will continue to exact, greater general and scientific acquirements from members of our profession—then I am sure I have laid before you sufficient inducements to work diligently—sufficient incentives to avail yourselves of the present opportunities for improvement; believing that the words written by an inspired writer (Isaiah xxxiii, 6) more than two thousand five hundred years ago, are as true now as then, that "in wisdom and in knowledge shall be the stability of Thy times."

LEUCOCYTHÆMIA IN A PIG.

BOLLINGER (*Archiv für Thierheilk.*, 1871) has described the appearances met with in the necropsy of a pig which had been killed after an illness of four days. The spleen was enormously enlarged, and in a condition of general cellular hyperplasia. The kidneys were also much enlarged; and in the cortical layer, both superficially and more deeply, were numerous irregular effusions of blood. The tissue of the organs was weak and pale. The liver was of almost twice the normal size; its parenchyma was pale. In both liver and kidneys there was diffuse fatty degeneration of the gland-cells, with abundant cell-proliferation in the interstitial tissue. In the lungs were found, scattered here and there, some masses about as large as hemp-seeds, formed of lymphoid cells. The relation of the white to the red corpuscles in the blood of the splenic vein was 1:4; in the renal veins, 1:5.

* That the greatest apathy prevails, notwithstanding the recent parodied watchword, *sanitas sanitatum, omnia sanitas*, was made notoriously manifest on the evening of Friday, April 5th, during the debate in the House of Commons on the second reading of the Public Health Bill—"a measure involving the health and happiness, the moral and material prosperity of the nation." The *Times* remarks on this occasion, that "a mere handful of members were thinly scattered over the ministerial benches, while the opposite side of the House looked still more deserted and forlorn." This manifestation of apathy on the part of the legislature may also be taken fairly to represent the sentiment of the country. "It is idle to hope," the *Times* continues, "that we can wage war with any measure of success against the forces of disease and death, unless the nation is inspired by a determined resolution to enforce Sanitary Reforms. Ministerial schemes for amending administrative machinery, or for consolidating existing statutes, the criticisms of Parliament, the warnings of science, are all inadequate to secure protection for the Public Health, unless by awakening the alarm and riveting the attention of the community we can obtain the effectual co-operation of all in the arduous work. But what hopes can we entertain of thus arousing a healthy public spirit, if the indifference of members to the vital importance of the questions discussed on Friday, shadows forth the state of opinion prevailing among the constituencies? Must we then be content to acknowledge that all the admonitory events of last year, the ravages of small-pox and scarlet fever, and the threatened approach of cholera, have been utterly without fruit? Certainly it appears that apathy has succeeded to panic; that the cold fit has followed the hot fit. Yet we hope this fatal torpor is but a passing symptom of reaction. All the warnings by which we ought to have profited, are still legible in the records of the national health, and in the testimony of skilled inquirers. Let us hope that the debate on the second reading of Mr. Stansfeld's Bill, tame and spiritless as it was, will bring them home once more to the public mind."—*Times*, April 8th, 1872.