

The influence of human progress on medical education. An introductory lecture delivered at the Royal Victoria Hospital, Netley, on commencing the twenty-fourth session of the Army Medical School, April 1, 1872.

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*Prof. H. Stromeyer
with Dr. Aitken's Compliments.*

THE
INFLUENCE OF HUMAN PROGRESS
ON
MEDICAL EDUCATION.

AN INTRODUCTORY LECTURE

DELIVERED AT

THE ROYAL VICTORIA HOSPITAL, NETLEY, ON COMMENCING
THE TWENTY-FOURTH SESSION OF THE ARMY
MEDICAL SCHOOL, APRIL 1, 1872.

BY

WILLIAM AITKEN, M.D., EDIN.,

PROFESSOR OF PATHOLOGY IN THE ARMY MEDICAL SCHOOL.

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LECTURE

ON THE

INFLUENCE OF HUMAN PROGRESS ON MEDICAL EDUCATION.

INSPECTOR-GENERAL INNES, PROFESSORS, AND GENTLEMEN,—

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 for the first time the candidates for each of the three branches of the Queen's medical service brought together here 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 many 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 civilization and 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 in her “*Letters from Italy*,” 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 unquestionable." 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 civilized world by the processes, no doubt, of education, of natural selection, and the struggle for existence.

The next period may be recognized 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 legalized. 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 graduation in that science, and where a degree in Medicine 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; for, there is now too much lecturing, as opposed to tutorial instruction and hindering it, 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 form part of elementary education, and thus be preliminary to purely professional study of every kind. 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; and the final one, to pass

for degrees and licences is 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 rejoice to see but one gateway to the profession, *in place of nineteen*—one central examining body—one examination, as uniform as possible, through which all must pass in order to receive a licence, simply qualifying 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

* “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. iii. vol. i. p. 279.

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.

But if we take a still wider survey of our position, we cannot fail to perceive that these great changes, in relation to Medical Science and the education of the Physician, are only a few of the many changes which go to make up the sum of human advancement in the march of civilization.

The changes in the world at large which have come about during the past, and comparatively short period, of FIFTY YEARS have not been equalled in any other like period of the world's history. Scarcely a year of that time has passed without leaving its obvious and ineffaceable mark behind. It has been common to characterize such periods by certain epithets,—such, for example, that this century commenced a period of transition; and while it has markedly differed from the previous half century ending fifty years ago, it is reasonable to believe that the years to come will contrast advantageously with the years that are now passing away. I believe in no limit to the onward march of Human Progress in the coming time; not "*till charity itself shall fail, till tongues shall cease, and till all knowledge shall have vanished away*."

The blessings which the period of peace brought to Europe, from 1815 to 1853, are scarcely yet sufficiently appreciated, especially as to the influence of that period on civilization; and

the present generation seems almost to have forgotten the profound security which prevailed in Europe during the years which followed the end of the great French war. The improved social conditions of the present day, compared with those of the first part of the century, are mainly due to a series of events developed during these eight-and-thirty years of *peace*. The century, indeed, began with very great improvements—overcoming space and time—especially in the opening up of communications between different places and countries, which have placed the present state of European society in striking contrast with the past. In 1801, Parliament sanctioned the first railway bill; and the first railway in England was opened for traffic in 1827. Increased activity in road-making, bridge-making, tunnelling, and railway construction continued to mark the progress of the century. The first carriage road across the Alps was completed in 1806—one of the greatest engineering achievements during a period characterized by gigantic triumphs of engineering enterprise and skill; and in 1870 the making of that great road was eclipsed, at least in usefulness, by the cutting of a railway tunnel through the mountain itself—a work which took fourteen years to complete.

The application of steam to *ocean* navigation is another great and characteristic achievement of this period of peace—an application which has done more to facilitate communication between distant places than any other invention. By mighty ocean steamships the great railway systems of the Eastern and Western Hemispheres are now connected in one universal net-work.

In 1825 it was considered a great feat when a voyage was effected by a steamer from this country to Calcutta, *round the Cape*, in 113 days; and up to 1837 the most extensive application of steam to navigation was that maintained by Admiralty steamers between Falmouth and the Mediterranean, touching at Gibraltar, and proceeding to Malta, the Ionian Islands, and the ports of Syria. But in that year attention was called to the practicability and the advantage of establishing a line of steam communication between this country and the United States.*

* The question had been gravely discussed in the mechanical section of the British Association at Bristol in September, 1836; and it is very curious now to look back and read the conclusions arrived at on this subject only *thirty-six years ago*, and compare them with the results that have since been attained. It was then thought "*that in the state of the steam-engine, as applied to nautical purposes, a permanent and profitable communication between Great Britain and New York, by*

Two years afterwards (1838) the "British Queen," intended to convey goods and passengers to New York, only 275 feet long and 1860 tons register, was the largest steam-vessel in the world! Compare this with such a ship as the "Great Eastern" and with the class of ocean steam-vessels now building; and look to what Science has achieved in the direction of ocean steam navigation! Living, as we do here, within sight of Southampton—a town whose memories are associated with many a welcome greeting, and many a sad farewell—from whose magnificent docks the most stately ocean steamships go forth as ever sailed or steamed upon the sea, who will venture to put a limit to what may yet be done in the progress of ocean navigation?

This country, indeed, has the very greatest inducement to exertion in such enterprise; when it is remembered that England is the most central spot on the earth (HUMBOLDT),—that, from its central and insular position no place has derived so much advantage, or is so capable of deriving advantage from the application of steam, or any other motive agency, to ocean sailing vessels, as England, and no town is so advantageously situated as Southampton; which, in relation to other ports on the shores of the whole world, is perhaps the most central port on that great highway of nations—the Atlantic Ocean. It was reckoned a great deed when a voyage by steam was accomplished from England to India, round the Cape; then came the "Overland Route;" and now, engineering skill and commercial enterprise has opened up a canal through the Isthmus of Suez, thereby making the Mediterranean Sea, the Red Sea, the Arabian and Chinese Seas, the Indian and the Pacific Oceans one continuous and direct *fareway* to Hindostan, China, Japan, and Australia, and to the western ports of the Western Hemisphere.

Improvements and extension of the postal system are now notable all over the world; and systems of international telegraphy by sea and land have literally realized the imaginings of England's greatest poet, when he wrote,—“I'll put a girdle round about the earth in forty minutes.” Three hundred years ago that idea was

steam-vessels making the voyage in one trip, must be regarded as in a high degree improbable!—that since the length of the voyage exceeds the present limits of steam power, it would be advisable to resolve it into the shortest practicable stages—say the most western shores of Britain, and the most eastern point of America!”—See *Transactions of British Association* for 1836.

but the airy fancy of "a Midsummer Night's Dream;" now the work has been accomplished, by which the history of the whole world is, day by day and hour by hour, brought before us by that electric telegraphy which first came into operation in 1836.

But, while fully recognizing the great mercantile facilities and mere commercial advantages which inevitably result from these various practical appliances of science to the daily work of life, there are other and far higher considerations which give them value, and which induce me to notice them as evidence of human progress—evidence of that tendency towards perfection influencing not only the education of our profession, but the amelioration of the condition of mankind.* The more obvious results of these appliances have been, not only to increase the number of travellers, who are constantly augmenting, but to break down artificial distinctions which tend to separate one man from another, removing prejudices, dispelling ignorance, and so tending to bring together more closely the several nations of the world; while the tendency at the same time is to widen and extend the field of scientific inquiry and of enterprise in every direction, and to employ more individuals actively in scientific work. Every improvement in means of communication opens up new avenues to fame and fortune, speeds the intercourse between mind and mind, and creates new demands for knowledge. Hence the very great advances that have been made in every department of human knowledge during the past fifty years, under the influence of "*an education subservient to action*" (BACON). Hence, also, another characteristic feature of this age is apparent in the very great spread of education and of general knowledge which has

* "In modern times the principal causes of the superiority of civilized men are to be found in inventions which, when once discovered, can never pass away, and the effects of which are in consequence in a great measure removed from the fluctuations of moral life. The causes which most disturbed or accelerated the normal progress of society in antiquity were the appearance of great men,—in modern times they have been the appearance of great inventions. Printing has secured the intellectual achievements of the past, and furnished a sure guarantee of future progress. Gunpowder and military machinery have rendered the triumph of barbarians impossible. Steam has united nations in the closest bonds. Innumerable mechanical contrivances have given a decisive preponderance to that industrial element which has coloured all the developments of our civilization. The leading characteristics of modern societies are in consequence marked out much more by the triumphs of inventive skill than by the sustained energy of moral causes."—*History of European Morals*, by W. E. H. Lecky, M.A., vol. i. p. 131.

taken place amongst the community at large; and the most distinctive work of the period has been to diffuse knowledge most widely among the middle classes, and necessarily amongst professional men.

Four great agencies may be recognized as having contributed to this diffusion, namely:—

(1.) The establishment of Mechanics' Institutions and Libraries throughout the country, as originated by Dr. Birkbeck in the beginning of the century.

(2.) The foundation of the London University in 1828.

(3.) The formation of the British Association for the advancement of science in 1831.

(4.) The institution in 1851 of International Exhibitions, bringing into friendly competition, in practical arts, the various nations of the world; and so leading up to those systems of industrial education inaugurated in this country and abroad by the late Prince Consort.

These agencies have given rise to a very marked and widely expressed desire for special practical instruction in the appliances of science—not to the exclusion of classical literature from our schools, but in order that the great facts of science and methods of investigation shall form *a part at least* of the regular curriculum of school instruction; and, that elementary instruction in science and in art should be introduced into all primary schools, so as to improve and render easier the *secondary education* of every man, in his special handicraft or profession. The fact, indeed, is becoming more and more obvious, that “a mind without scientific culture is a very partially educated mind—not half educated nor half prepared for the common purposes of modern life.”* The inducements to learn have indeed extended in a ratio much more rapid than the means. The applications of science to the everyday work of life have so surrounded us with wonderful results, that *indifference* with many has at last become *inquiry*, and *self-interest* has become active where even *curiosity* was wont to slumber.

Hence the present period may be described as a period of *Education* and of *Competition*. Of *Education*, in the widest sense of the term, embracing not only mental training, but

* Professor Allen Thomson's Address at Edinburgh, in 1871, to Members of the British Association, as President of the Physiological Section.

especially the all-important training of the hands and eyes, and, of the senses generally, in that technical knowledge and skill which must eventually measure or gauge either a man or a nation, and fix their relative values in the great market of the universe. *Of Competition* in every grade of life:—by it you have acquired the privilege of sitting in these seats; and by competition you will have to take your places in the remainder of that life-long race which you have still to run. The spirit of the age is indeed marked by the *keenness* of competition—which is making plain to all the advantages of education and of knowledge in the daily struggle for existence and for advancement. Twenty or thirty years ago the necessity of “educating the masses” (as the phrase went) was fiercely contested—now a necessity for a national education to embrace the very poorest classes is generally admitted, and has been legislated for. The aim of education now is—*first*, to make it practically applicable to the affairs of life; and, *secondly*, to enable the people to *continue the education of themselves*. Never before has such attention been paid, as now, to the theory and methods of education, from the days of Socrates to the days of School-Boards; and it is well known that a much larger proportion of the people, all over Europe, now read and write than formerly, while the means and habits of reading have greatly increased everywhere. Newspapers and periodical literature of all kinds have multiplied with a most prolific abundance, and the press—in philosophical and professional not less than in general literature—has become more powerful than ever as a medium of communication of thought and influence.* The Commissioners appointed to inquire into the state of popular education in England have shown that since 1803, when the number of day scholars in the larger towns of the kingdom was estimated at

* “A most momentous intellectual revolution is at present taking place in England. The ascendancy in literary and philosophical questions, which belonged to the writers of books, is manifestly passing, in a very great degree, to weekly and even daily papers, which have long been supreme in politics, and have begun within the last ten years systematically to treat ethical and philosophical questions. From their immense circulation, their incontestible ability, and the power they possess of continually reiterating their distinctive doctrines, from the impatience too of long and elaborate writings, which newspapers generate in the public, it has come to pass that these periodicals exercise probably a greater influence than any other productions of the day in forming the ways of thinking of ordinary educated Englishmen.”—*History of European Morals*, by W. E. H. LECKY, M.A., 1869, vol. i. p. 136.

1 in 17 or 18 of the population, the numbers instructed up to 1870 were as many as 1 in 5, and that 1 in $6\frac{1}{2}$ were in average attendance. Such statistics show the great and steady progress which has been made since the early part of the century, both in the extent of provision made for the education of the poorer classes and in their appreciation of its value. In our days the children of the lowest ranks (*where education has reached them*) are in many points more highly educated than were those of independent people, and even of the nobles of the fourteenth and fifteenth centuries. But that is not saying much; for, with all that has yet been done, the educational means of the country are still very deficient, and reports of the examination of the scholars by H. M. Inspectors of Schools show that in no case do they rise beyond such an amount of education as is considered little better than practical ignorance amongst the middle classes. So deplorable, indeed, "is the state of elementary education that, with every desire to do so, it has been found impossible to give the working classes the instruction which they so much desire to receive, in the sciences connected with their work. They are not able to read with sufficient ease to master the books put before them, or to take any pleasure in reading. They cannot write well enough to make notes of what they hear or see; nor are they sufficiently familiar with arithmetic to make necessary calculations." Indeed, it is found practically that the great difficulty in promoting technical education is the want of primary fundamental training as the basis of scientific knowledge.* Hence the general failure of Dr. Birkbeck's well meant institutions for the education of working men, which were quite an age before their time. Nevertheless, the numerous literary institutions and circulating libraries all over the country (although some of them come to an untimely end) testify to the spread of education, of reading, and of refinement; while there is obviously also an unprecedentedly increasing desire for more instruction among the middle classes of society—who have already made the greatest advances in knowledge, and who do most of the scientific work of the country.

Such spread of education has been regarded with mingled feelings of approval and disapproval; but it has not been found that it fuses or tends to level any one class with another,

* Rushton, *Nature*, June 22, 1871, p. 143.

as some feared it would do. On the contrary, education must relatively raise every class, when it is still more universally diffused; and grades of culture must continue to exist as heretofore. The tune of education will come to be pitched at a higher key-note, but harmony will still prevail. The middle classes have so advanced already that a great chasm is interposed between them and the labouring population. That chasm is daily widening by the rapid progress in knowledge, in civilization, and in material well-being of the middle classes, while the actual labouring men tend to be left farther behind than they were before. The progress of education downwards must therefore tend to diminish this great chasm, and so restore a more harmonious grade in the culture of society. It will also enable the working man to profit from technical instruction. It will give more frequent opportunities for individuals to raise themselves out of the station in which they were born into higher ranks. Even now how often do we read of the sons of tradesmen becoming senior wranglers at English Universities, or taking the highest honours in science at the cosmopolitan Universities of Scotland or of London, qualifying themselves for the highest offices of the Church, the Bar, or the State—for Civil, Military, and Professional life? Practically, therefore, it may now be considered (since purchase in the Army and patronage in the Navy have been abolished) that the highest offices *in the world* are open to any one whose powers of intellect, strength of body, and opportunity for advancement may carry him onward in the race.

Such are a few evidences of Human Progress generally—examples of the tendency towards perfection in experimental science and amelioration of individual conditions during the past fifty years; and with these great advances of knowledge and education there has also come a proportionate increase of the power of Public Opinion—the most certain indication of health in the onward march of civilization.

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 times 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, and when education amongst the community generally is pitched at a much higher key-note.

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, namely,—(1.) Has 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 it may fairly be said to have done so; but every energy is required to maintain our position, to keep pace with the progressive and rapid development of the other sciences, with the spread of education throughout the country, and the inevitable “tendency towards perfection of experimental sciences 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.

* “No doubt, the sovereignty of man lieth hid in knowledge.”—BACON.

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, Saint Thomas's Hospital, and Saint 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—one which is certain to make great progress; and it seems to me as the kind of work which rightly takes the place of an 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 the application of 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, by the triumphs of physical science, inventive skill, and industrial enterprise. 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 the profession of Medicine,—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, microscope 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 take place. But, at the same time, there is abundant evidence to show that Medical Science and Medical Education has advanced, and is 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

* “It is as inevitable that Knowledge should have the supremacy over Ignorance, as that Day should come when the sun shines.”

certain knowledge taught as to the means of their prevention; 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 detail of improvements in practical Medicine are very important and very numerous, even as they are set forth in our textbooks of Medicine.

But, while Medical Science has *not* been behind the advance of other sciences, and a review of the achievements of Medicine

* On this point Mr. W. E. H. Lecky, in his most interesting and erudite *History of European Morals*, hazards the following forecaste, 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 unrealized 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 fatal diseases, and the empirical nature of nearly all our best medical treatment, have been often recognized. 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 anæsthetics 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, systematizing, 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).

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 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, nor 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 those influences from the vicinity of man 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 preventible 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

* That the greatest apathy prevails, notwithstanding the recent parodied watchword, “*Sanitas sanitatum, omnia sanitas*,” was made notoriously manifest on the evening of Friday the 5th of April, 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



fruits of sanitary science seem to have been little in Civil life compared with what they have been in the Army and Navy. The reductions in the range of mortality among 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 Command, for example, from 1817 to 1836, the mortality ranged in different years between 43 and 169 per 1000 men. During the past ten years, the range has been reduced to between 5 and 29 per 1000 men. In Jamaica, the range of mortality, formerly between 61 and 307 per 1000 men, has been reduced to between 7 and 71. In Gibraltar, a range of between 8 and 128 per 1000 men, 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 1000, was brought down to 60, and now stands at 26 per 1000. St. Helena, from 25 per 1000, was reduced to 12, and now stands at 9 per 1000. Ceylon from 74 per 1000 was reduced to 38, and now stands at 24 per 1000. 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

criticisms of Parliament, the warnings of science, are all inadequate to secure protection for the Public Health, unless by awakening the alarm and rivetting 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 8, 1872.

* "Thirty-five years ago the mortality of the army amounted to at least three per cent. annually; on the average of the five years 1865-1869, it was under $1\frac{3}{4}$ per cent.—to speak precisely it was 16.55 per 1000, as compared with 30 per 1000 twenty-five years ago."—Dr. T. G. Balfour, in *Journal of Statistical Society of London*, March, 1872.

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 co-equal 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 refinement, 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?

Although the military and naval systems of the country (and especially the officering of the Army and the Navy) are confessedly, at present, in a state of transition, it is not difficult to form an estimate of the relative educational acquirements of those who are likely to compose the Army and the Navy of the future.

That the work of the soldier and of the Army is "*skilled labour*" must be obvious to any one who will look into a little book called "*The Soldier's Pocket-Book*" (now in its second edition), written by Sir Garnet Wolsley—an experienced officer and distinguished soldier. We obtain from such a book a more elevated notion of the duties and work of a soldier than has hitherto been the popular idea of such work and duty—of the absolute need he has for individual education, and a knowledge of nearly every science and

trade. The progress of science, the extended and still extending use of scientific inventions, and of arms of extreme precision in modern warfare, necessitate a corresponding development of intelligence throughout all ranks of the Army and Navy, in order to derive corresponding benefit from these scientific inventions. The scientific knowledge of an officer now, therefore, implies a training far higher, more intellectual and practically professional than has hitherto been required in this country. A general education is required of him to begin with, at least equal to that of barristers and of medical men; besides the technical knowledge of his profession. Service in the Army or Navy as a commissioned officer being now also open by public and unrestrained competition to men of every class and rank of life, who are qualified by preliminary education and probational professional training to perform their duty, the military and naval officer must prove himself a man of education, if he desires to advance in either service; and the standard of general and professional attainments among officers must of necessity gradually raise itself, *even still higher than now*, by the spirit of emulation and of competition amongst those who enter the services. "The theory of the 'New Army Regulation Bill,' and of the changes proposed in officering the Army and the Navy implies that rank shall be proportionate to aptitude and intellectual capacity for duty, so that continual and more or less severe study must ever engage the attention of the British officer in both services, who looks to advancement in his profession." The profession of arms, whether on land or sea, as now understood and rightly followed, must be looked upon as one which tends not only to enlarge the intellect, but even to elevate the moral feelings. It is, indeed, a noble profession, to which the honour and safety of the nation is entrusted; and therefore it is justly believed that the more intellectual and moral force that can be accumulated in the services of the army and the navy, the more formidable must the trained physical force become. The more the individual intelligence of the officer is cultivated, whether soldier or sailor, the longer will the individual last; because with education he may learn to know better how to take care of himself and his men.

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 civilized 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 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 times 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 has improved, 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 mem-

bers 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* more than 2500 years ago, are as true now as then: that *in wisdom and in knowledge shall be the stability of thy times.*

* Isaiah xxxiii. 6.

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