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THE HISTORICAL STUDY OF MEDICINE.

CONCLUDING PORTION OF AN

ADDRESS

TO

THE GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.

MARCH 15, 1878.

BY

PROFESSOR FERGUSON, M.A.,

HONORARY PRESIDENT OF THE SOCIETY
FOR SESSION 1878-79.

GLASGOW:
Printed at the University Press by
ROBERT MACLEHOSE, 153 WEST NILE STREET.
1880.

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THE first portion of this address was occupied with a criticism of Black's discovery of the difference between the mild and caustic alkalies. This portion is omitted, as it may hereafter be incorporated with a more extended review of Black's work. The remainder, now printed, seeks to point out the educational and positive value of a historical knowledge of his science or profession to the student who wishes to cultivate it in the broadest spirit.

UNIVERSITY OF GLASGOW,
June 16, 1880.

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ADDRESS.

* * * * * *

IN what I have now placed before you, I have been actuated by the desire, in the first place, to make you acquainted with the work of a really great man, in whom we ought all to feel a special interest—as a most notable member of our University; in the second place, to draw your attention more fully to a discovery which made an epoch in chemical science; and in the third place, to illustrate the interest of studying a subject historically.

I have often wished for an opportunity of entering into such events and such lives, but your time is so fully engaged, and there is so much of present knowledge to be acquired, that lectures on the history of science are out of place and impertinent. I question also if it ever occurs to you that the sciences you are engaged with have a history, or if that history can have any interest, and I wish now to make a few remarks in conclusion upon this subject.

I am quite ready to admit that the study of history has no practical bearing on your professional skill and proficiency, but I do not admit so easily that it would not have

a very important influence on your general opinions as liberally-educated physicians and surgeons.

We are all in our ordinary work labouring to improve the skill we already have, or to acquire that which will hereafter be of use in our professional avocations ; but we must also try to remember that while we sacrifice much of our individual self-improvement, or—to use the vulgar slang of the day—our self-culture, in order to become better instruments to effect purposes out of ourselves, we are not bound to sacrifice our whole time and tastes even to the profession by which we are to live ; but while we conscientiously do the best for it we can, we must neither degrade ourselves to mere traders, nor our professions to trades. There is little chance of that taking place during the University curriculum, but there is a chance that the studies of the course may be attended to with too immediate an eye to their practical bearings, and even to their proximate use in passing examinations. In this and similar societies, however, you have the opportunity of getting out of the ruts you have generally to move in, of arranging your thought upon the subjects which interest you, and of hearing what others think of your views. One cannot always be treading the same gin-horse round. It is profitable, both physically and mentally, to try to view our subjects from a distance, or in the light of other studies, to learn what other people think of them, and to see what place they occupy in the great system of human knowledge.

Now, among the possible ways of untrammelling our-

selves from the absorbing interest of what we are engaged with now, I know of no more profitable supplement to ordinary work than to get out of the present with all its self-assertion, its petty and irritating details, its muddiness and falsity, and try to realize what our favourite study was like in previous times ; to try to understand what our predecessors did, what difficulties they faced, what advances they made; how far we have advanced, but how very far we are from having arrived at the full truth and bearings of any one fact, how very cautious we should be in accepting current opinions as proved, especially when they are found to be popularly acceptable. I need not remind you that popular beliefs are regulated, as a general rule, not by reason, but by very different motives—by mere opposition to other views; by dislike to the holders of these views; by admiration of the propounders of the views espoused ; by material, or political, or similar interests ; in short, by all sorts of motives, rather than by their own inherent and necessary truth.

The one great lesson of history—so far as we know anything of history at all—seems to me to be this, that under very different physical and natural conditions, under very different degrees of civilization, under very different kinds of government, and in very different social surroundings, human nature has remained practically the same. You will find proportionally as many credulous people at the present day as there were in the so-called dark ages, though credulous about different things and in different ways. Says a somewhat sarcastic writer :—" The great

bulk of the philosophical acquirements of the public in every age is and can be nothing else than downright superstition—that form of superstition which accords with the spirit of the age being, however, always reckoned knowledge. The people who in the nineteenth century disbelieve in the existence of witches are just as superstitious in their unbelief as those who in the sixteenth century held that belief; for the latter believed on the authority of the intellectual guides of the day, and the former disbelieve on the same unsatisfactory grounds. The people of the sixteenth century believed that there were witches, because all the divines and philosophers, all the Courts of Law, and all the Universities of Europe, attested the fact. The people in the nineteenth century reject this faith with contempt, because all the Mechanics' Institutions, all the Phrenological lecturers, and all the pennyworths and twopenceworths of useful knowledge in the land call on them to do so. Thus, in the language of Sir Thomas Browne, 'whether the object whereunto they deliver up their assent be true or false, they are incompetent judges. For the assured truth of things is derived from the principles of knowledge and causes which determine their verities; whereof their uncultivated understandings scarce holding any theory, they are but bad discerners of verity, and in the numerous tracts of error but casually do hit the point and unity of truth.' (*Vulgar Errors, b. i. c.* 3.)"

No better example could be given than the universal belief in the Evolution Hypothesis, a belief held by persons who may or may not have read the books of Darwin

and others, but who never observed the facts, or could have observed the facts, and are of course essentially unqualified to draw any conclusions from them. It is often said by such non-qualified supporters of a system, that it commends itself to the mind by its own truth: that is—that because it seems true, it is true. A more correct way of stating the matter is that the doctrine is plausible, and that the plausibility imposes on the mind of those to whom the whole matter is critically inaccessible. The test, however, of a doctrine is to be found not in its mere popular acceptance, but in the rational criticism of those who are specially qualified to judge of it. If it is always worth while to listen to what a really qualified and able thinker has to say in favour of a doctrine, it is of still greater value to hear what he has to say against it, though it does not follow that his criticism will be accepted, especially if it run counter to what the writer just quoted calls the 'superstition' of the time. The propounder of a new idea or doctrine brings it forward with caution, not unaware that he may be mistaken in details and particular applications. He knows that the strength of his chain of arguments is the strength of the weakest of them. Those, however, who adopt his teaching overlook this, and are apt to ruin the whole by their blind advocacy of the whole, by their unwillingness to see that there are, or may be, imperfections in the argument. Then come criticism and sifting, and then it is worth while certainly to listen to objections—to accept the proved truth of the doctrine, and to reject what is erroneous and

imperfect. To acquire the power to do this, to acquire the philosopher's love of truth in itself, is the aim of all education and training, and is usually gained after long and patient labour only. You will meet plenty of people who make a personal question of some point in abstract science, and will suffer no discussion of it without the intrusion of their own individual feelings. Theology used to be famous for this personal element, but the students of both pure and applied science are not less distinguished by their disputes and their personal feuds.

Popular sciences, like geology, where observation and collection of facts seem to be easy, are very apt to suffer from hasty generalisations, and in consequence from the disputes of the supporters of these. The fact is, however, that of all sciences geology is the last that should have hastily-devised theories. When one considers the immense field of observation which has never been worked; when one considers that all we know about the earth's substance is derived from a very imperfect examination of a layer of it, the proportional thickness of which is like that of a sheet of paper to a three feet globe; that the more minutely we examine the structure and composition of minerals and rocks, as, for instance, by the microscope, and by chemical and spectroscopic analysis, the more complicated the phenomena become; that physicists have only touched the problems of terrestrial magnetism and electricity and the effects of the sun's heat and light in the possible production of slow alterations in the earth; that chemists are quite at a loss to account for the mode

of occurrence of the elements, or to explain the conditions under which many, one might say most, compounds are formed: when one considers all that, one would expect geologists to be very sparing in their hypotheses indeed and to hold not too strongly by those they had formed. Some of you may have read Hugh Miller's *Testimony of the Rocks* and other attempts to reconcile geological speculation with the Mosaic account of creation. But what is the history of these attempts? Pretty much that the problem Miller set himself to solve was chimerical. The Mosaic account is not a system of geology, and the stage of geological hypothesis existing in Miller's time, which many thought exceedingly dangerous, and which Miller, with this feeling, set himself to confute and explain, has inevitably, by the progress of time and historical evolution, passed away, and geological science is now in quite a different category from what it was then. Students of science, especially of the sciences of observation, are gradually learning that nature is too vast and too minute to be comprehended all at once in the laws they construct. But it is a very slowly-learned lesson; and the other taught by history, if they would only lay it to heart, is to esteem very lightly popular controversies, and to judge of authority not by popular admiration of it, but by the reasoned truth of its views. In such a doctrine as that of Darwin, which I could not presume to criticise, and to which I should, therefore, be very cautious in assigning either assent or disbelief, it seems to me that its value is not to be

reckoned now, but only hereafter, when the truth which possibly it does contain, is sifted from those imperfections which are inherent in the work of the very best men, and from which it is a gratuitous assumption that Mr. Darwin's can be altogether free.

When I said that one of the ways of freeing ourselves from the shackles of present commonplace was the study of history, I meant, of course, not a study merely of curiosity to know what were the facts of previous times, for that is of small advantage, but the philosophical study of events to enable us to acquire the right way of judging our own time, and above all that passionless spirit which will make the judgment we form worth anything. You will find those who discuss with great personal animus events which may have happened two, or five, or ten centuries ago, as if their display of feeling could alter in the smallest degree the nature of the byegone events. In fact, the discussions between antiquarians have provoked quite as much rancour as between the most opposite schools of naturalists at the present moment. No class of students seem exempt from infirmity of temper when their favourite doctrines or views are impugned. It requires very long discipline to reach that halcyon calm of judgment when one can say of such an attack: If the doctrine be a true one, this obscuration of it will be but temporary—but if the doctrine be essentially wrong, and this assault be directed to the extinction of the error, then not only will the assault finally succeed, but whatever delays its

success will make it ultimately more resistless. Many people seem to dread that if truth is eclipsed during their time, or in their generation, it is extinguished for ever; they also dread that what of truth they may have discovered or insisted upon is lost to the world if it does not carry all before it during their own existence. Both beliefs are unfounded, narrow, unworthy of philosophers. The continued study of the philosophical history of any department of knowledge has certainly the tendency to induce this desirable coolness of judgment and stability of opinion. In it we see what controversies have been carried on from time to time, how truth has emerged from these, under what conditions and after what disputes, how the persons engaged have borne themselves in the debate, what are the qualities of mind which upon the whole are most successful in bringing it to a close.

The instance I have already given you is a fine study in this reserve in controversy. So far as I know, Black never replied to Meyer's criticism. If anything ever tried his temper, and even that only to a modified extent, it was Lavoisier's appropriation of his views while examining Meyer's at length, and giving his apparently only slight attention. He felt quite satisfied with the truth of his explanation of the cause of causticity, and he left it to others to discuss the *pros* and *cons* of the question. History has shewn Black's correctness. History alone makes Meyer's book—to which I have already alluded—worth anything more than waste paper.

Now what is true of the sciences in general is espe-

cially true of medicine. If any science, or, rather, any collection of sciences—which medicine is—has had a history, or development to be traced historically, if it has passed through very varied stages, if it has been inundated with controversies each of them of all-absorbing importance for the time and of hardly any importance for after days, it is medicine. If you think of the observation of facts, knowledge, and practical skill of Hippocrates, the systematic expositions of Galen, the gradual falling off of real scientific observation and exposition and the adherence—the tremendous adherence—to authority, during the middle ages; if you think of the curious succession of theories and of systems in medicine which prevailed during the last three centuries, and of the disputes, and quarrels, and recriminations, which took place between rival schools, you must see that if you desire to have a liberal and comprehensive view of your profession, you should endeavour to become acquainted with these different stages, and try really to comprehend what have been the influences internal and external which have moulded medicine to its present shape. Medicine is not an isolated study—on the contrary, it is dependent on every improvement in physical, and chemical, and mechanical science—and all these are external influences. No one can look at the apparatus of the physiologist, or of the surgeon, or obstetrician, without seeing how dependent they have been on discoveries in mechanics, in optics, in electricity; and whoever compares the last *British Pharmacopœia*, 1877, with Salmon's *New London Dispen-*

satory, third edition, 1685, or even the *New Edinburgh Dispensatory*, 1791—third edition, "with a full and clear account of the new chemical doctrines published by Mr. Lavoisier," will see how much pharmacy depends on the abstract researches of chemists into the nature of matter. When the history of medicine in the nineteenth century comes to be written, no small portion of it will be occupied with the development of medicine and surgery, in consequence of the increased facilities afforded to practitioners by the advances in quite other lines of scientific discovery.

Among other external influences which have really affected medicine in the past, and are doing so at present, and may do still more in the future, is State control. It is perhaps reasonable that there should be control of some kind, but it is possible that a profession may be injured both by State caressing and State harassing. It is very important for all of you to remember that you are qualifying yourselves to undertake certain legal obligations, and you should therefore consider duly what is best for the free growth of a profession, so necessary for the artificial and feverish life of such an age as this, without its being clogged by troublesome restrictions and conditions on the one hand, and on the other being so free as to admit of violent innovations, or of the too easy admission of unqualified men, who would cause deterioration of the whole body to which they would belong. The history and effects of legislation upon the development of medicine is a topic well worthy of consideration by those

who wish to take a broad view of the social and political significance of their profession, and who may hereafter be rendered anxious in consequence of some proposed legislation, and I would accordingly throw it out as a hint for any of you who may be in search some time or other for a subject for a thesis.

Within medicine itself, however, there are forces at work which produce a development at a particular time, and under peculiar circumstances. Theories of disease may be propounded, theories as to the actions of drugs, and so on, which prevail for a certain time, and then disappear before others which spring up to suit a new time. The variation of treatment from the last generation to the present is due possibly to sounder views based on a more accurate anatomy, a more extensive physiology and pathology, and a more comprehensive grasp of all the conditions — geographical, meteorological, sanitary, social, mental—of modern life, but possibly also to mere fashion, the less original, less educated, less thoughtful, obeying the dictation of the better qualified or more innovating, and possibly to imperceptible changes in the actual nature, the actual physical and mental condition of the population. Bleeding, for instance, has gone out of use. Is that due merely to fashion, or to a sounder view regarding its utility, or to a change in the physiology of the men of this generation, which renders bleeding inappropriate? Perhaps after all, then, Paracelsus was not so egregiously in error when he preached Galen for the Pergamenians, Hippocrates for

the Greeks, Avicenna for the Arabs, Paracelsus for the Germans, and maintained that every nation and every country required its own medical theory and its own physicians to apply it. Who shall say that bleeding may not again become a fashion, or a necessity, if it ever were such?

It may seem in these cases as if there were a return to the ideas of a younger time, but it is after all only in appearance. Retrogression in knowledge is impossible, facts and truths may be forgotten and then be rediscovered, but the rediscovery is attended with new conditions, new accompaniments. The old fact remains, but it stands in a totally different relation to its contemporary surviving facts, because, in the interval, new facts have come to light, and these are accompanied by new ideas. But how are we ever to grasp the full significance of these facts, these varied aspects, these newer views? The answer is unavoidable; only by historical study.

Physiologists, and zoologists, and anatomists tell us that fully to comprehend any one animal, it must be studied not only through its whole individual existence from the embryo up to the adult stage, but it must be studied also in connection with the development of the whole animal kingdom, because what may be obscure or imperfect in one animal may become intelligible if we compare the development of the same parts in a number of animals. Moreover, that some things incomprehensible to the student of present living forms can be elucidated only by the examination of extinct fossil forms, so that

the naturalist must study the development of an individual not only in itself, or in its family, but must correlate it with the whole animal kingdom, both in space and in time, if he wish fully to comprehend its nature.

If it is true of the mere physical life of animals and of their forms that they must thus be studied historically, it is equally true of the far nobler thought of man. For while the mind of each individual has a history, and the family and nation to which he belongs has a history, the efforts of a great number of minds directed to one object for a long period of time have in that very circumstance of necessity a development, and it is this which constitutes the history of art, of philosophy, of literature, and of science. It is the study of this which liberalises one's views, restrains the overweening conceit which causes every age to esteem itself superior to its predecessors. It is the study of such history of medicine that I would commend to the attention of all of you who wish to be not merely successful bread-winning practitioners for the next thirty or forty years, but to be intelligent and appreciative learners from the lives and labours of those physicians and naturalists who preceded you, and to whom you owe everything.

NOTE.

An illustration of what is said above (p. 17) about the impossibility of retrogression in knowledge, might be drawn from the way chemists have been recently working round to the position taken up by Berthollet eighty years ago, but since Dr. Black has been so much in our thoughts, I select the following because it is another instance of Black's singular insight into natural phenomena, as well as being intrinsically interesting. The description is appended to what Black says about Solution in his Lectures, vol. I. p. 273. "Third Rule.—Frequent agitation of the solvent also promotes solution, by removing the saturated parts of it. This is a curious subject, and of most extensive influence."

In note 19, p. 541, the Editor of Black's lectures, Sir John Robison, says:—

"Dr. Black sometimes explained the effect of stagnation, and the propriety of agitating the mixture, at length, but has not committed his view of the matter to writing. I recollect distinctly the explanation which he gave in 1765 at Glasgow. A tall beer glass being filled with water, a long funnel was put into it, whose pipe reached to the bottom, and as much of a saturated and deep-coloured solution of blue-vitriol was poured in, as occupied about an inch at the bottom of the glass. It was set on a bracket, having a white paper behind it. This was done some days before this lecture, and the students were made to observe how the colour slowly ascended upwards, growing fainter and fainter as it was farther up the glass. In this lecture Dr. Black observed that this gradation of colour showed that the different horizontal strata of the fluid were in different states of saturation, and because the colour did not change by sensible steps, but gradually, the difference between two contiguous strata in respect of saturation was infinitely small. Therefore, since the attractive force of a stratum was so much the greater, as it contained less of the salt, and as the adjoining stratum contained more, it must follow that, in any horizontal section, the force drawing the salt upward must be extremely small, and the motion extremely slow; and that the only method to make it proceed faster, is to bring the parts which contain

least salt into contact with those which contain most. As a proof of his doctrine, he kept the glass clear of all disturbance, on the bracket; and three months after, the colour had not risen three inches. Indeed it did not reach near the top after three years. Dr. Black explained the slow communication of heat along the parts of solid bodies, and the effects of stagnation in the atmosphere, in the same manner."

The facts and the way of exhibiting them have not changed in the least, but the diffusion of liquids, discovered and its laws laid down by Graham, now bears a very different relation to the rest of science from what Black's isolated observation did to the physics and chemistry of his time. So far as I know, Graham was not aware of Black's priority, and Black's lecture experiment was equally unknown to Sir William Thomson, who has had a secular experiment on the diffusion of sulphate of copper proceeding in the Natural Philosophy Class Room of the University for some years past.