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SCIENCE IN RELATION TO MENTAL AND MORAL CULTURE.

THE PRESIDENT'S ADDRESS

Delivered at the Annual General Meeting, July 24th, 1880.

BY T. SPENCER COBBOLD, M.D., F.R.S., F.L.S.

Gentlemen,—In selecting a subject on which to address you, I must apologise for stepping out of the more or less well beaten track of my predecessors. Doubtless the great success of this Club arises from the fact that its practical working rests upon the broadest possible basis ; that basis being but an expression of the principle of equal giving and receiving. As long as this principle of action is retained, and as long as its office-bearers continue to be animated by that unselfish spirit which formed so conspicuous a feature in the career of John Quekett, so long will the Club that bears his respected name continue to flourish.

As I do not despise the humblest efforts in microscopic investigation, you will permit me to remind you that the ultimate aims and profits of science do not solely rest either with the power of appreciating the loveliness of the objects presented to view, or even with the accuracies of description that may be made to accompany specimens. We neither undervalue the beauties of external form nor the mechanical adaptations shown by the complexities of internal structure, when, taking all the characters of any given organism into view, we draw what may be termed the *higher conclusions* which their consideration legitimately yields. It is only by the philosophical method of which I speak that the full value and significance of Nature's teachings are arrived at ; and, moreover, in this way only can the area of science become enlarged. To enlarge the borders of science is the object of every scientific association, and we think that the practical work, as embodied in our proceedings and in the Journal of the Club shows that, however inconspicuous that work may be, we have at least some clearly defined part and lot in this matter. The Club does not unduly flatter itself by fearlessly asserting that it contributes towards the "extension of the known." Viewed broadly, that extension involves issues of the highest possible consequence to society in general ; for, it not only helps to advance the

material comfort of individuals, but at the same time it enlarges the capacity for intellectual enjoyment, carrying with it a higher sense of the value of this present life. I should not be true to the views I hold of the exalted aims and objects of science did I not deliberately express the belief that the discipline of natural science exerts an immeasurably greater power for mental and moral culture than all the inculcations of ancient dogmatic systems of theology rolled together into one.

Other conditions being equal, the relative degree of personal superiority which one individual acquires over another is dependent upon and in strict accordance with the amount of culture and discipline of the mind. With this proposition I start ; and though the subject before us is a large one, even the few remarks I have to make will, I think, be sufficient to prove its truth.

Rightly or wrongly I am with those who hold that the intellectual culture and moral training of the mind should go hand in hand ; for the former process, unaided by the latter, is apt to induce a distorted view of the economy of nature, leading finally to an unsatisfying phase of materialism. Some people are sufficiently illogical to petition for a "right judgment in all things," who nevertheless take no steps to promote the culture of their own proceedings.

Now the most ordinary standards of mental and moral acquirement demand, above all things, that we should be open, honest, straightforward, and sincere ; and a yet higher principle teaches that we should be gentle and unselfish. In the prosecution of our various outside callings—no matter how humble they may be—we soon find ourselves possessed of power over the minds and hearts, so to speak, of those by whom we are surrounded. The higher our intellectual attainments the greater our responsibilities, and therefore also the more necessary that we should exercise such powers as we may possess discreetly and for the best ends.

Some may think that in matters of science this high standard of action is altogether out of place, and the caution therefore unnecessary. Pardon my freedom. All history proves that it is given to few men to exercise power wisely and well. If you have any doubt respecting the truth of this general statement, I invite you to consult Lecky's "History of Rationalism." Read it attentively. Think over its startling records. Generalize for yourselves. You will there find quoted abundant instances of misdirected power. You will note the fact that relentless tyrannies have been employed solely for the pur-

pose of supporting particular opinions. These opinions took the form of dogmas which at the present day comparatively few intelligent persons would for a moment entertain. They were the result of that most dangerous of all forms of ignorance, namely, an *educated ignorance*. I hope my meaning is fully understood. Ignorance which is the result of mere neglect of education, seldom injures anyone but its possessor; but ignorance which is the result of erroneous teaching, spreads its fatal poison far and wide, cramping the intelligence of entire generations.

The love of power—political, social, and religious—is very fascinating; and it is particularly worthy of remark that the gross persecutions of former times were perpetrated by men who in private life were rightly considered amiable, pious, and even learned. The evidence on this score is thoroughly trustworthy. It is certainly also most instructive. Some think this phase of human conduct peculiar to the past—a mere development of the so-called dark ages. Than this view, nothing could be more unphilosophical. The same phenomena show themselves at the present day, only their manner of display is somewhat altered by modern environments.

The evil results of misdirected power are, of course, best realised when exhibited as the deeds of strong organisations. A perfect parallelism subsists between the persecutions exercised by educated authorities of early times and the petty tyrannies exercised by bullying boys at public schools. Not only so, uneducated working men, when misguided by self-seeking trades-union leaders, lend themselves to unjust deeds of a precisely similar order. Rightly guided by men of high mental and moral culture, societies of the kind referred to might become, and, indeed, in some places, have already become centres of incalculable good. At present, however, it may be that our improvement is more imaginary than real. Power is the same dangerous weapon now that it ever was in olden time. It holds the same sway over the individual that it does over the organised community. It is an instrument for good or evil according as you wield it. Probably, if a fair estimate could be formed, relatively, of the motives which have led men to persecute their fellows in earlier and later times, we should have to own that, of the two, the baser sort characterise the present age. Intolerant and ignorant bigotry induced the former—“*educated ignorance*,” and vindictive selfishness the latter.

As already hinted, the weapon may be employed individually as

well as collectively. Armed with it the most amiable of men have been converted into veritable fiends ; and even in the ordinary affairs of every day life, it is rare to see power exerted with purely disinterested and unselfish aims. As a combination of intelligent men, however, I claim for the true votaries of science conspicuous virtue in this relation. Probably there are few walks in life in which the exercise of authority and party spirit for selfish ends are so little known. Occasionally our leaders in science, doubtless animated by the best intentions, act imprudently in their official recommendations. Something of the kind recently occurred at one of our learned societies, when the action in question was instantly disapproved by the rank and file of the distinguished body in question. It is not often that science apes the function of the autocrat ; nor are the recommendations of scientific leaders either to be viewed uncharitably, or to be superseded without good reason. At all events I can with confidence assert that there is no calling—if science may be thus denominated—in which personal independence and individuality are so remarkable. Organisations to enforce particular views, dogmas, or modes of thought are almost entirely unknown ; but where any great or good work likely to promote the social, moral, and intellectual welfare of the people is concerned, there you will find these lovers of science (however divergent their habits in respect of other matters which necessarily engage their attention) unite together as one man. Trickery of all kinds they utterly despise ; nor is it scarcely possible for a truly scientific man to indulge in speculative follies which will not bear the light of day. I have sometimes observed that persons, whose mental and moral culture has never been exercised, either in looking through a microscope or in acquiring the rudiments of biological and physical science, a positive inability to tell “ the truth, the whole truth, and nothing but the truth.”

If exhibitions of inaccuracy and untruthfulness are admitted to be humiliating and barbaric, let not those who disapprove flatter themselves that the practice of absolute integrity is easy. Unfortunately, criteria of smallness of principle are sometimes noticed in men of science, or rather in some who have worked in science, but who have missed the higher aims of science. Such displays are doubtless rare ; but when they occur they are not difficult of detection, since they appear without being sought for. Greatness of principle is all the greater by contrast. When on a former

occasion I had the honour to address you, we placed some of these elements of scientific strength and weakness side by side ; and in particular I singled out the confession of the father of the healing art, who, in the interests of medical science, thought it his duty to make admission of an error. In like manner I pointed to the very similar conduct of other leaders in science, both past and present. With such splendid examples of generous conduct before us, I hold that a perfect reciprocity should characterise the dealings of all scientific associations, as well as individuals ; for certainly, whatever mental endowments our generalised anthropomorphic ancestors displayed, a monkey-like selfishness lies at the bottom of all untruthfulness. Mental littleness so ill consorts with the pursuit of science, that where it exists it renders its unfortunate possessor one of the most unlovely objects it is possible to contemplate.

It must be clear to you that the attainment of high excellence in any walk of life is necessarily reserved for the few. Men having eight or nine feet of physical stature are not more rare than intellectual giants of the Shakespearian or Newtonian type. So long, however, as we aim at the highest improvements attainable under the varied conditions in which we are severally placed, we have no right to be dissatisfied with an elevation which may be extremely low when contrasted with that acquired by others more favourably placed. Think for a moment what a multitude of circumstances must combine in a man's favour to make him really eminent. The patronage of the great and wealthy will not accomplish it. Distinctions allotted by their capricious favour will only receive endorsement from an immediate and very limited posterity. The more enduring credit rests upon a securer basis. Even the comparatively dwarfed intellect may by the exercise of perseverance and its best powers secure a better future record than is likely to be obtained by the more fortune-favoured man of undoubted ability. If any one present be tempted to murmur at his narrow chances in this relation, I pray him reflect upon the thousandfold more limited opportunities of certain of his fellow men. I do not refer to the strangely conditioned inhabitants of remote geographical areas ; but I simply allude to the uneducated peasantry of our own loved island, who, whatever may be their natural capacities, have not the vestige of a chance of rising above a level which many of us would, if we had to occupy it, think degrading. Yet we might descend much lower. I, for one, cannot doubt that amongst our myriads of

poor there are germs of greatness which—were all the circumstances favourable—would develop intellectual prodigies capable of astonishing the civilised world. The biographies of some of our so-called self-made men testify to the truth of this assumption. These self-made individuals achieved success and overcame the otherwise insuperable difficulties of their position not alone by their high mental and moral qualities. In the first instance, doubtless, these qualities attracted the sympathy or goodwill of benevolent and intelligent persons (higher up in the social scale). The patrons, again—themselves probably possessing sound mental culture—voluntarily promoted their advancement ; but, mark you, success would, even now, never have followed, had not the essential elements of strength been afterwards supplemented by sustained energy and perseverance. Facts of this kind, duly weighed in our minds, inevitably lead to the conclusion, that for every one such favoured individual, ten thousand others, of equal capacity, have intellectually perished. If I may do so without offence, I would add that reflections of this sort, borne out as they are by similar dispensations affecting the welfare and even the existence of every living thing, whether plant or animal, should tend to make us active and diligent in improving the measure of means and capacity we may severally happen to possess. If to rise be difficult, to sink is easy ! The maintenance of a fair level in this struggle is not of ready accomplishment, especially if the point of departure has been moderately elevated. Certainly, it is a gratifying sight to see a man, however humble his outward position in life, hold his own either in an intellectual or moral point of view. It is refreshing to see him bearing down, though it be by painfully slow degrees, all opposition to his progress ; for, rest assured, each individual success is an important contribution to the sum of human advancement, and who can tell that it may not be by such achievements—coupled with the side by side growth of a multitude of other social, political, and even religious developments—that the further progress of our race shall be secured, and ultimately precede or actually eventuate in that high destiny which has formed the subject of predication and hope by the most enlightened in all ages ?

I have casually referred to the uncivilised of foreign lands. We all remember the strange effect which the sight of the ocean had upon the Makalolo followers of Dr. Livingstone. In one case the shock was so great that the native leaped over-board and dis-

appeared beneath the waves. This was the effect of the sudden inrush of new ideas. The remarks which some untutored minds utter when they look through a microscope for the first time, show a bewilderment which, though not leading to the same disastrous results, forcibly remind one of the stupidity of the unhappy savage. The mental phenomena are identical in kind, though differing in degree. The extreme case is, of course, the more striking, and therefore, in some senses, the more instructive. On my mind, at least, it forces the conviction that uncultured mental processes, like erratic meteors, are apt to fly off at a tangent when subjected to impulses that are entirely new to them; but where the brain-processes are trained aright, they will, despite all accidents, maintain their own orbit and travel safely onwards in that legitimate sphere of activity which Nature has assigned.

Let me now offer you some other reflections. As society is at present constituted, a very palpable want of sympathy exists between different bodies of educated men. This arises from the fact that we are hopelessly specialised, both as to our modes of thinking, as well as upon the general subject-matter of our thoughts. The majority are only interested in those things which belong to, or rather, are supposed to be proper to their particular calling. They will converse on little else than mere business or professional topics; consequently they naturally tend to group themselves in coteries whose dimensions are commensurate with their necessarily abridged sympathies. In some cases there exists a positive antagonism, more or less strongly pronounced. Perhaps this is best seen in the respective attitudes of the men of theology and science. What a painful process it is to wade through the "History of the Conflict between Religion and Science," even as it is recorded in the attractive little volume by Professor Draper, of the New York University. In spite of all this I sometimes do not feel very sure that we ought to deplore this antagonism, since the economy of things in general seems to imply that all progress is the resultant of mutually conflicting agencies. Be that as it may, the facts of the case are palpable. Let us take an illustration from ordinary daily life. It is only a false delicacy which refuses to face a feature representing a palpable blot in our social system.

Fifty-two days in every year a large proportion of the inhabitants of this country are induced by choice or habit, blended with a sense of duty, to listen to pulpit teachings. I have followed and enjoyed

the same privilege. The clerical body abounds with scholars and learned men ; and from personal knowledge and friendly relations, I can testify that it contains many of the most estimable, gracious, and gifted of our race. We are proud to number some of them amongst our members. Why, therefore, it may be asked, should there be any impropriety in unveiling impressions which contact with their persons, and, as a rule, honestly enough imparted instructions are intended to supply? The reason is very simple. It is the sight of our manifest divergencies, coupled with the fear of perfect freedom of utterance. Of course no rightly constituted mind would desire to give needless offence. Let me state the case more fully. The clergy and ministers looking back, not without legitimate pride, to the time when their predecessors were almost the sole instructors of our race, naturally advise in a ruling way ; whilst, at the same time, they submit their own intelligences to preconceived opinions which the necessities of their position oblige them to entertain. The contrast between them and men of science thus becomes striking. Our fetters are of the slenderest kind ; their's are as links of iron. The bond of union between us is human sympathy ; yet our several studies and pursuits tend to disunion. There is even an antagonism in the method and subject-matter taught here, as contrasted with the educational antecedents of those who are placed over us by the verdict of what is called "Society." Here, for example, we dare to think for ourselves, and neither up nor down to any particular standard of authority ; and, moreover, in view of supplying ourselves with the means of mental improvement, we seek to acquaint ourselves with some of the grandest truths which the microscope, aided by the study of Nature in the field, is capable of unfolding. Thus it is that the biological and physical sciences open up to our view the character and uniform working of some of those laws by which all existing things are sustained from day to day. By the method pursued in our Club and elsewhere, ordinary facts, which to the common vacant mind, have no sort of definite meaning or significance, are marshalled together so as to constitute an unbroken sequence or harmonious whole. By-and-bye the relations subsisting between these facts become more and more evident ; whilst, eventually, the ultimate intention of the relations themselves, and even also sometimes the particular why and wherefore of their being bursts upon the mind with all the glowing influences of a newly acquired truth. Thus, also, it becomes clear that the power

of perceiving scientific truth and its actual acquirement together involve a large amount of moral discipline; and it is nothing but daily and hourly contact with those whose intellects are unduly bowed down by the business of mere money-getting that the gratifications afforded to a mind thus taught are lessened.

How different is the case with those of our clerical friends or ministers who do not cultivate scientific tastes. Taking an average pastor, what is the net result of his collegiate career? The educational environment has of necessity exercised its differentiating power, and in cases where natural amiability has not operated to lessen the divergence, he stands quite apart as a highly specialised individual, sometimes so painfully so as to be quite unapproachable. If, for example, in conversation, the bent of your mind should suggest comment on a recent scientific discovery, see what difficulties you would have to encounter. You refer to the record, let us say, of an eclipse of the sun on one of the Assyrian tablets; unfortunately, that is likely to throw doubt on his ordinarily received chronology. You change about, and speak perhaps of a remarkable fossil recently discovered in the lowest palæozoic strata; it must have lived eons and eons of years gone by, and therefore (contrary to his notions) enables you to affirm that death occurred millions of years before the appearance of the race of man. One step further, and you venture to remark upon the "evidence as to man's place in Nature," his alleged antiquity, and the distinguishing characters between the lowermost types of the human race and those of the anthropomorphous apes. Well, now, you are not necessitated to believe all that has been said or written upon this subject; but certain it is that the pastor, unless he be of the Canon Kingsley type—happily increasing in numbers and influence every year—will by this time have classed you with those dangerous individuals, geologists and the like, who are of all men to be avoided. Meanwhile, the conversation has become restrained and without much further ceremony you respectfully bid each other adieu. In plain terms, the results of scientific discovery do not accord with his views, and he entertains a profound suspicion as to the safety of your evolutionary doctrines.

A few words more. I think it one of the chief glories of biological or Natural History Science that it affords the most readily accessible means of invigorating the mind, at the same time that it regulates the moral and intellectual process. The carefulness,

patience, self-discipline, and general accuracy which the pursuit of any one of its various branches begets is remarkable. The man whose mind is totally deprived of such aids is apt to become dogmatic and narrow in the extreme. His views of Nature are inadequate, and dwarfed by a thousand prejudices. Popular errors sway his mind to and fro after the fashion of an angler's float upon the ruffled stream. Day dreams of the past are to him as present realities. He may even look to the form and visage of the moon to guide him as to probable changes in the weather, and he is entirely unaware how much he remains the child of a diluted superstition. Clearly it is nothing to him, that "the highest meteorological authorities, after a series of minute observations, continued through many years, have come to the conclusion that no influence of any sort can be traced" in this relation. Ignorant of his own ignorance, he is minded to remain so; and he fortifies his position by a record of the experiences of his fellow men, who, guided by the same teachings, are necessarily as unenlightened as himself. I am free to confess that it is not pleasant to unveil truths, the enunciation of which implies defects so generally prevalent. Yet, how can those of us who love science for its own sake do otherwise? It is a disadvantage to the votary of such knowledge that his sense of its value constrains him to invite others to share the intellectual feast; for you must perceive that the mere assumption of his legitimate position lays him open to the charge of immodesty. Be it so. I am fully sensible of the tendencies of the present hour; yet I believe that even wealth, without "mental and moral culture," is a poor possession. What painful proofs of the want of scientific culture does "Society," in the so-called upper ranks, afford. To kill time, its members are obliged to saturate themselves with frivolous pursuits. An enlightened daily press even ventures to condemn their craze for *tableaux vivants* and private *corps de ballet* competitions with theatrical managers. Far be it from the votaries of science to seek to lessen personal delights and social enjoyments. We contend that whilst science does not lessen life's pleasures, its votaries rarely become the victims of a frothy and unsatisfying ambition.

Not without strong convictions have I ventured thus to utilise the honoured position which your suffrages have so kindly conferred. If I appear to have exceeded my official liberty, you will lay it down to my desire to err rather on the side of zeal than on that of

indifference to the cause we all have at heart. I would say to each fellow-member, "go on seeking knowledge, microscope in hand, and never mind the toil and trouble involved." In some shape or other reward will sooner or later follow, but I neither dare nor care to promise that it shall end in pecuniary increase. In the future, as in the past, let every true representative of natural or physical science claim a measure of your esteem and regard ; and should you at any future time realise more fully than you do now, the advantages you have derived from joining the Quekett Microscopical Club, do not forget that most of these were due to the hearty and disinterested efforts of as genial and devoted a set of office-bearers as it was ever a President's privilege to work with. Gentlemen—I bid you farewell.

