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CULTURE AND SCIENCE.

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A SHORT time ago, it will be remembered, an English gentleman, eminent as a classical scholar, and as a man of refined and æsthetic tastes, otherwise culture, delivered a lament in this city on the decadence of literature and the usurpation of science. He whom we are wont to call, without titular prenomen, Matthew Arnold, has long enjoyed the esteem of all English-speaking peoples, and I think that I can safely say that scientific men generally commiserate with the eminent *littérateur* in his evident grief, although they must equally generally fail either to discover the ground for his prognostications or to dread the impending dilemma. The Cassandraic laments of the apostle of culture have long been re-echoing throughout Great and Greater Britain, and his latest utterances were essentially the repetition of the wailings poured out into the sympathetic ears of the select Cantabrigian scholars and published broadcast in the *Nineteenth Century* some eighteen months ago (Aug. 1883, pp. 216-230). What his feelings were then and long before are thus told by him.

“‘No wisdom, nor counsel, nor understanding, against the Eternal! says the Wise Man.’ Against the natural and appointed course of things there is no contending. Ten years ago I remarked on the gloomy prospect for letters in this country, inasmuch as while the aristocratic class, according to a famous dictum of Lord Beaconsfield, was totally indifferent to letters, the friends of physical science to the other hand, a growing and popular body, were in active revolt against them. To deprive letters of the too great place they had hitherto filled in men’s estimation, and to substitute other studies

for them, was now the object, I observed, of a sort of crusade with the friends of physical science—a busy host important in itself, important because of the gifted leaders who march at its head, important from its strong and increasing hold upon public favor.

“I could not help, I then went on to say, I could not help being moved with a desire to plead with the friends of physical science on behalf of letters, and in deprecation of the slight which they put upon them. But from giving effect to this desire I was at that time drawn off by more pressing matters. Ten years have passed, and the prospects of any pleader for letters have certainly not mended. If the friends of physical science were in the morning sunshine of popular favor even then, they stand now in its meridian radiance. Sir Josiah Mason founds a college at Birmingham to exclude “mere literary instruction and education;” and at its opening a brilliant and charming debater, Professor Huxley, is brought down to pronounce their funeral oration. Mr. Bright, in his zeal for the United States, exhorts young people to drink deep of ‘Hiawatha;’ and the *Times*, which takes [the gloomiest view possible of the future of letters, and thinks that a hundred years hence there will only be a few eccentrics reading letters and almost every one will be studying the natural sciences—the *Times*, instead of counselling Mr. Bright’s young people rather to drink deep of *Homer*, is for giving them, above all, ‘the works of Darwin and Lyell and Bell and Huxley,’ and for nourishing them upon the voyage of the ‘Challenger.’ Stranger still, a brilliant man of letters in France, M. Renan, assigns the same date of a hundred years hence, as the date by which the historical and critical studies, in which his life has been passed and his reputation made, will have fallen into neglect, and deservedly so fallen. It is the regret of his life, M. Renan tells us, that he did not himself originally pursue the natural sciences, in which he might have forestalled Darwin in his discoveries.”

Are Mr. Arnold’s representations respecting the attitude towards literature on the part of the advocates of physical science literally correct? Are they not exaggerated? Most certainly the curriculum of Sir Josiah Mason’s Science School does not exclude literary instruction, but only such as the sole objective end, and Professor Huxley happily anticipated the objection made on the occasion referred to by Mr. Arnold. As I have elsewhere¹ shown, in a review of Professor Huxley’s *Science and Culture*, he fully recognizes the urgency of literary culture, and simply deprecates an

¹The Critic (New York).

undue attention to the neglect of more practical studies. On the occasion in question he merely reiterates them; and to those who would urge that want of cultivation of the ancient languages and literature entails narrowness of thought, he replies that "the advocates of scientific education might fairly enough retort upon the modern Humanists that they may be learned specialists, but that they possess no such sound foundation for a criticism of life as deserves the name of culture. And, indeed, if we were disposed to be cruel, we might urge that the Humanists have brought this reproach upon themselves, not because they are too full of the spirit of the ancient Greek, but because they lack it." Nevertheless, he afterwards says, he is "the last person to question the importance of genuine literary education, or to suppose that intellectual culture can be complete without it. An exclusively scientific training will bring about a mental twist as surely as an exclusively literary training." He thinks that there is no need, however, that such a catastrophe should happen. Instruction in English, French and German, such as is provided for in the Mason Scientific School, renders accessible "the three greatest literatures of the modern world," and if an Englishman cannot get his literary culture out of his Bible, his Shakespeare, his Milton, neither will the profoundest study of Homer and Sophocles, Virgil and Horace, give it to him." These opinions are valuable as emanating from one who in his own person combines scientific and literary culture of no common order.

But what is culture? From the writings of Mr. Arnold, as well as from the observations of those who are generally conceded to be "men of culture," I infer that it has, in the opinions of such, a narrower range than is admitted in the dictionaries of the English language. Therein we learn that culture is "the application of labor or other means to improve good qualities or growth;" or, "specifically, any training or discipline by which man's moral and intellectual nature is elevated; or, "the result of such training, enlightenment, civilization, refinement." Further, we learn that "the word culture has made its way among us from Germany mainly through the influence of Goethe, and that "we speak now of the culture, whether of a nation or individual, as a kind of collective noun for all that refers to the higher life."

But it appears that such definitions are too latitudinarian and vague. According to the special culture-worshippers, it seems that certain things must be done and certain other things left undone to entitle to entry into the fold of culture. For example, above all

things the Latin and Greek languages and literatures must be mastered, for the main object in life must be to make and understand classical allusions, and there can be no more grievous sin against culture or more glaring evidence of want thereof than not to understand every inuendo or allusion made in polite converse which springs from a classical source; not only ancient but modern poetry must be read, and not only read but enjoyed (this too is essential), and the principles of metric composition understood; otherwise will the failing individual incur the charge of lack of culture. With a touch of pity Mr. Arnold recalls that "Mr. Darwin once owned to a friend that for his part he did not experience the necessity for two things which most men find so necessary to them—poetry and religion; science and the domestic affections, he thought, were enough."

On the other hand, a very limited knowledge or even ignorance of things practical or natural is tolerable from one who has the positive qualifications specified. Even mathematics has entered too largely into the curriculum of the universities of England, and Mr. Arnold, for instance, declared on the occasion of his address here noticed, that "if in the Cambridge Senate House one may say such a thing without profaneness, I will hazard the opinion that for the majority of mankind a little of mathematics, also, goes a long way. Of course this is quite consistent with their being of immense importance as an instrument to something else; but it is the few who have the aptitude for thus using them, not the bulk of mankind."

Many there are and many must there be who will object to the restriction of the term culture as thus advocated. In fact, the issue, so far as Mr. Arnold is concerned, is not between culture and science, but between a one-sided attention to classical studies and certain departments of science. The alternatives, as they appear to Mr. Arnold, are expressed in the following terms:—

"A certain president of the Section for Mechanical Science in the British Association is, in Scripture phrase, 'very bold,' and declares that if a man, in his education, 'has substituted literature and history for natural science, he has chosen the less useful alternative.' Whether we go to these lengths or not, we must all admit that in natural science the habit gained of dealing with facts is a most valuable discipline, and that every one should have some experience of it.

"But it is proposed to make the training in natural science the main part of education, for the great majority of mankind at any

rate. And here, I confess, I part company with the friends of physical science, with whom up to this point I have been agreeing. In differing from them, however, I wish to proceed with the utmost caution and diffidence. The smallness of my acquaintance with the disciplines of natural science is ever before my mind, and I am fearful of doing them injustice. The ability of the partisans of natural science makes them formidable persons to contradict. The tone of tentative inquiry, which befits a being of dim faculties and bounded knowledge, is the tone I would wish to take and not to depart from. At present it seems to me, that those who are for giving to natural knowledge, as they call it, the chief place in the education of the majority of mankind, leave one important thing out of their account—the constitution of human nature.”

That important element to the constitution of human nature, we elsewhere learn. A knowledge of all nature (and man is a part) is the domain of Science, but still, we are told, “it will be knowledge only which they give us; knowledge not put up for us into relation with our sense for conduct, our sense for beauty, and touched with emotion by being so put; not thus put for us, and therefore, to the majority of mankind, after a certain while unsatisfying, wearying.”

I cannot forbear, in this connection, to once more cite Mr. Arnold. In his Cambridge address he recalled to his auditors a certain utterance of his of the past.

“Some of you,” he said, “may have met with a phrase of mine which has been the object of a good deal of comment; an observation to the effect that in our culture, the aim being to know ourselves and the world, we have, as the means to this end, to know the best which has been thought and said in the world.”

But to know only the best, however desirable—and it is supereminently so—is only to very imperfectly know the world and human nature. And the experience of many in this audience will attest to the fact that idiosyncracies are only partially controlled by education. Many classical students,—many who have passed with honor out of our colleges after having pursued the entire curriculum of the humanities—have shown a lack of morality and integrity all the more glaring because of their culture, and I doubt not that some of you may recall those whose scholastic training has been ripe but yet who have ended their career in a prison cell. Some of those who have thus lapsed have done so in consequence of the inaptness of their furniture for the struggle of life. There are those of

them too, I know, who have charged their incomplete lives to that insufficiency of a collegiate course for the practical end of existence. This insufficiency has become so patent to many that they have demanded a change in the college curriculum, and this demand has come less from those interested in scientific pursuits than from those who have contemplated from outside the triumphs of science and have desired its advantages to be more feely extended and opened. The advantages of a scientific training are so evident that they need not be urged. In the words of Mr. Arnold, "the great results of the scientific investigation of nature we are agreed upon knowing, but how much of our study are we bound to give to the processes by which those results are reached? The results have their visible bearing on human life. But all the processes, too, all the items of fact, by which those results are established, are interesting. All knowledge is interesting to a wise man, and the knowledge of nature is interesting to all men."

It is in view of this conceded usefulness of science and its relations to everyday life that there is an ever-increasing demand on the part of comparatively disinterested lookers-on to force it into college. This demand, as before indicated, is not so much from the acknowledged representatives of science as from the general community, and men of science interpose ever to moderate the demand and to recommend the retention of what are called the humanities in the educational course. They urge that it is not the part of science or true culture (which amount to almost the same thing) to reject the one and to devote attention alone to the contemplation of gross matter. They are satisfied to give room and time, so far as may be possible, to all knowledge, and they do not find fault even with those who, like Mr. Arnold, think that "if there is to be separation and option between humane letters on the one hand and the natural sciences on the other, the great majority of mankind, all who have not exceptional and overpowering aptitudes for the study of nature, would do well to choose to be educated in humane letters rather than in the natural sciences. Letters will call out their being at more points, will make them live more.

"And, indeed," continues Mr. Arnold, "to say the truth, I cannot really think that humane letters are in danger of being thrust out from their leading-place in education, in spite of the array of authorities against them at this moment. So long as human nature is what it is, their attractions will remain irresistible. They will be studied more

rationally, but they will not lose their place. What will happen will rather be crowded into education other matters besides, far too many; there will be, perhaps, a period of unsettlement and confusion and false tendency; but letters will not in the end lose their leading place. If they lose it for a time, they will get it back again. We shall be brought back to them by our wants and aspirations. And a poor humanist may possess his soul in patience, neither strive nor cry, admit the energy and brilliancy of the partisans of physical science, and their present favour with the public to be far greater than his own, and still have a happy faith that the nature of things works silently on behalf of the studies which he loves, and that, while we shall all have to acquaint ourselves with the great results reached by modern science, and to give ourselves as much training in its disciplines as we can conveniently carry, yet the majority of men will always require humane letters, and so much the more as they have the more and the greater results of science to relate to the need in man for conduct, and to the need in him for beauty."

There is much in these utterances of Mr. Arnold which can be re-echoed by the man of science. Doubtless the exclusive status of the humanities in the educational curriculum has been lost beyond redemption; in some institutions, at least, they no longer take the lead, and above all, their study has been to some extent sanctified by scientific methods. But the enlightened chiefs of science, far from denying, claim a place for the humanities parallel with those of their own chosen departments. What they do propose, in response to popular clamor, is not to exclude classical studies, but to leave to those students who have matured sufficiently to face a near future the option of a course which may be most useful to them in their after careers. The knowable is only less measurable than the unknowable, but human capacity and life are finite. Grecolatry and Latinolatry are sometimes obstructive. The physician will have less use for a profound knowledge of the humanities than of humanity; the chemist or miner will doubtless find Greek and Latin of use, but much less than German or French and still less than an elementary acquaintance with matter. The future merchant may be glad to bandy classical allusions with his customers, but a knowledge acquired, in the schools, of the objects of his trade will save much cost and labor in those years when time and labor are of most account. Let all be allowed to elect those

studies which may be most useful to them in their chosen walks in life.

In coming time there must needs be a modification of educational methods for adaptation to the increasing ramification and development of the tree of knowledge; and if early youth is the best time for learning languages, so is it—and to even a greater degree—the best time for the cultivation of the logical and observing faculties. There must be sacrifice of some branch of learning, and what that shall be should probably be determined by the position of the individual and his tastes and aptitude. A technical education is at least more likely to be of future use to most persons than a classical one, and will certainly fit one better for the struggle of life, even if, as might be contended, it will be less apt to render him “philosophical” under its calamities.

I cannot forbear, even at the risk of being regarded digressive, to here interject some remarks respecting the place of the classical languages in general philosophy. We are constantly being told that the Latin and Greek are the most perfected and the highest developed of all tongues, and it is implied that others are less so to the extent by which they deviate from those stocks. I have no hesitation in utterly denying such a statement, and the claim in question is the result of that lack of broad culture which is incident to exclusive or undue attention to what is called a classical curriculum. The Greek and Latin languages really represent an immature although nearly adolescent stage of linguistic development, the former being nearer the primitive stage, while the latter is on the whole appreciably more advanced in natural development. The inflections, which have been claimed as a feature of excellence, in truth are characteristic of the youth of language and of barbarous peoples. Such nations, for example, as the American aborigines (Choctaws, Creeks, etc.) and the Eskimo, exhibit a complexity of inflection which is immeasurably in advance of the classical ones, and the same reasons which have been urged for the supremacy of Greek and Latin are applicable in a far higher degree to the Eskimo and Choctaw. The decay of inflections may almost be said to be in an inverse ratio to the healthy growth of expression, and we may justly claim, on scientific grounds, that of all languages, English is the most advanced in its developmental career, so far at least as differentiation of its elements is concerned. These utterances, although they may appear heterodox to some, I feel

assured will be challenged by no scientific philologist. It would be easy to justify them, but time forbids. I close, therefore, with some ideas as to the relations of Science and Culture.

Science is often personified as an aggressive being and even as a demon, shoving and pushing all else away and endeavoring to throttle and kill all else, that it alone may live and flourish. A falser conception is scarcely possible. This aggressive demon is not science, but a man of straw. Yet the disciples of theology and the apostles of culture seem to be made alike unhappy in their contemplation of the portentous and horrid offspring of their imaginings, and batter away at the impassive man of straw while complaining of his aggressions. Science is rather a goddess who is rich in attributes and ready to reward her worshippers, but coy in her gifts; she is generous only to those who worship at her shrine in sincerity and truth, and who supplement their prayers by continual labor and deeds. To such she distributes her gifts much according to their deserts. Her worshippers are generally content with their several portions, and in her temple enjoy such sweet communion and peace of mind that they envy not the lots of those outside; if at all solicitous for any outsiders they are actuated by motives of philanthropy and benevolence alone to invite such to share with them. What other possible motive can there be for proselytism? They repose in the temple, itself on an eminence above the turbid billows of popular boisterousness, and can contemplate without alarm the strife of faction and of sects below. The outcries and assaults against science are, therefore, without justification, and are evidently the outcome of jealousy and rivalry among the worshippers at other shrines; those interests appear to be imperilled, and they dread popularity so manifested by the number of votaries wending their way in ever-increasing throngs to her temple. Such pilgrims, however, are not unthinking followers of aggressive and proselytizing apostles, but are attracted by the clear atmosphere of the heights on which the temple is perched and by the gifts which the goddess half conceals and only imperfectly exhibits to new disciples.

Near her portals, there are no runners who clamor to all in view to come in and believe as they do or be killed and damned. The priests who guard her shrine warn those that would approach to come *not* save they are prepared to cast off their garments of prejudice and to test all things by trained sense, experience, and reason.

Her votaries are not forbidden to doubt what is uttered in her temple ; doubt as encouraged as a prelude to faith.

Science is most catholic in her regards, and none are denied entrance to her temple who submit to her laws. Conditions are imposed, it is true ; but all those who give obedience to the few conditions are admissible. One of the conditions is that common sense intensified shall be applied to all questions. If it is the historian, he must learn to doubt and to weigh the statements handed down from posterity ; if the Greek or Latin scholar, he is refused, not because of his Greek and Latin as taught in the schools, but because only so knowing he knows too little and too imperfectly ; when he has gained increased knowledge and breadth of view so that he knows his language as a harmonious part of a great whole, he, too, is eligible. Science takes cognizance of all nature and all the outcome of nature. How, then, can there be any antagonism between science and culture when true culture is only an esteemed and devoted offspring of science ? Any antagonism between the two is as causeless and insensate as the revolt of the members against the body imagined in the ancient apologue.