Literature and Science
by Matthew Arnold (1882)1

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Practical people talk with a smile of Plato and of his absolute ideas; and it is impossible to deny that Plato's ideas do often seem unpractical and impracticable, and especially when one views them in connection with the life of a great work-a-day world like the United States. The necessary staple of the life of such a world Plato regards with disdain; handicraft and trade and the working professions he regards with disdain; but what becomes of the life of an industrial modern community if you take handicraft and trade and the working professions out of it? The base mechanic arts and handicrafts, says Plato, bring about a natural weakness in the principle of excellence in a man, so that he cannot govern the ignoble growths in him, but nurses them, and cannot understand fostering any other. Those who exercise such arts and trades, as they have their bodies, he says, marred by their vulgar businesses, so they have their souls, too, bowed and broken by them. And if one of these uncomely people has a mind to seek self and philosophy, Plato compares him to a bald little tinker, who has scraped together money, and has got his release from service, and has had a bath, and bought a new coat, and is rigged out like a bridegroom about to marry the daughter of his master who has fallen into poor and helpless estate.

Nor do the working professions fare any better than trade at the hands of Plato. He draws for us an inimitable picture of the working lawyer, and of his life of bondage; he shows how this bondage from his youth up has stunted and warped him, and made him small and crooked of soul, encompassing him with difficulties which he is not man enough to rely on justice and truth as means to encounter, but has recourse, for help out of them, to falsehood and wrong. And so, says Plato, this poor creature is bent and broken, and grows up from boy to man without a particle of soundness in him, although exceedingly smart and clever in his own esteem.

One cannot refuse to admire the artist who draws these pictures. But we say to ourselves that his ideas show the influence of a primitive and obsolete order of things, when the warrior caste and the priestly caste were alone in honour, and the humble work of the world was done by slaves. We have now changed all that; the modern majesty consists in work, as Emerson declares; and in work, we may add, principally of such plain and dusty kind as the work of cultivators of the ground,, handicraftsmen, men of trade and business, men of the working professions. Above all is this hue in a great industrious community such as that of the United States.

Now education, many people go on to say, is still mainly governed by the ideas of men like Plato, who lived when the warrior caste and the priestly or philosophical class were alone in honour, and the really useful part of the community were slaves. It is an education fitted for persons of leisure in such a community. This education passed from Greece and Rome to the feudal communities of Europe, where also the warrior caste and the priestly caste were alone held in honour, and where the really useful and working part of the community, though not nominally slaves as in the pagan world, were practically not much better off than slaves, and not more seriously regarded. And how absurd it is, people end by saying, to inflict this education upon an industrious modern community, where very few indeed are persons of leisure, and the mass to be considered has not leisure, but is bound, for its own great good, and for the great good of the world at large, to plain labour and to industrial pursuits, and the education in question tends necessarily to make men dissatisfied with these pursuits and unfitted for them!

That is what is said. So far I must defend Plato, as to plead that his view of education and studies is in the general, as it seems to me, sound enough, and fitted for all sorts and conditions of men, whatever their pursuits may be. "An intelligent man," says Plato, "will prize those studies which result in his soul getting

soberness, righteousness, and wisdom, and will less value the others." I cannot consider that a bad description of the aim of education, and of the motives which should govern us in the choice of studies, whether we are preparing ourselves for a hereditary seat in the English House of Lords or for the pork trade in Chicago.

Still I admit that Plato's world was not ours, that his scorn of trade and handicraft is fantastic, that he had no conception of a great industrial community such as that of the United States, and that such a community must and will shape its education to suit its own needs. If the usual education handed down to it from the past does not suit it, it will certainly before long drop this and try another. The usual education in the past has been mainly literary. The question is whether the studies which were long supposed to be the best for all of us are practically the best now, whether others are not better. The tyranny of the past, many think, weighs on us injuriously in the predominance given to letters in education. The question is raised whether, to meet the needs of our modern life, the predominance ought not now to pass from letters to science; and naturally the question is nowhere raised with more energy than here in the United States. The design of abasing what is called "mere literary instruction and education," and of exalting what is called "sound, extensive, and practical scientific knowledge," is in this intensely modern world of the United States, even more perhaps than in Europe, a very popular design, and makes great and rapid progress.

I am going to ask whether the present movement for ousting letters from their old predominance in education, and for transferring the predominance in education to the natural sciences, whether this brisk and flourishing movement ought to prevail, and whether it is likely that in the end it really will prevail. An objection may be raised which I will anticipate. My own studies have been almost wholly in letters and my visits to the field of the natural sciences have been very slight and inadequate, although those sciences have always strongly moved my curiosity. A man of letters, it will perhaps be said, is not competent to discuss the comparative merits of letters and natural science as means of education. To this objection I reply, first of all that his incompetence, if he attempts the discussion but is really incompetent for it, will be abundantly visible; nobody will be taken in he will have plenty of sharp observers and critics to save mankind from that danger. But the line I am going to follow is, as you will soon discover, so extremely simple, that perhaps it may be followed without failure even by one who for a more ambitious line of discussion would be quite incompetent.

Some of you may possibly remember 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. A man of science, who is also an excellent writer and the very prince of debaters, Professor Huxley, in a discourse at the opening of Sir Josiah Mason's college at Birmingham laying hold of this phrase, expanded it by quoting some more words of mine, which are these: "The civilised world is to be regarded as now being, for intellectual and spiritual purposes, one great confederation, bound to a joint action and working to a common result, and whose members have for their proper outfit a knowledge of Greek, Roman and Eastern antiquity, and of one another. Special local and temporary advantages being put out of account, that modern nation will in the intellectual and spiritual sphere make most progress, which most thoroughly carries out this programme."

Now on my phrase, thus enlarged, Professor Huxley remarks that when I speak of the above-mentioned knowledge as enabling us to know ourselves and the world, I assert literature to contain the materials which suffice for thus making us know ourselves and the world. But it is not by any means clear, says he, that after having learnt all which ancient and modern literatures have to tell us, we have laid a sufficiently broad and deep foundation for that criticism of life, that knowledge of ourselves and the world, which constitutes culture. On the contrary, Professor Huxley declares that he finds himself "wholly unable to admit that either nations or individuals will really advance, if their outfit draws nothing from the stores of physical science. An

army without weapons of precision, and with no particular base of operations, might more hopefully enter upon a campaign on the Rhine, than a man, devoid of a knowledge of what physical science has done in the last century, upon a criticism of life."

This shows how needful it is for those who are to discuss any matter together, to have a common understanding as to the sense of the terms they employ,--how needful, and how difficult. What Professor Huxley says, implies just the reproach which is so often brought against the study of belles lettres, as they are called: that the study is an elegant one, but slight and ineffectual; a smattering of Greek and Latin. and other ornamental things, of little use for any one whose object is to get at truth, and to be a practical man. So, too, M. Renan talks of the "superficial humanism" of a school-course which treats us as if we were all going to be poets, writers, preachers, orators, and he opposes this humanism to positive science, or the critical search after truth. And there is always a tendency in those who are remonstrating against the predominance of letters in education, to understand by letters belles lettres, and by belles lettres a superficial humanism, the opposite of science or true knowledge.

But when we talk of knowing Greek and Roman antiquity, for instance, which is the knowledge people have called the humanities, I for my part mean a knowledge which is something more than a superficial humanism, mainly decorative. "I call all teaching scientific," says Wolf, the critic of Homer, "which is systematically laid out and followed up to its original sources. For example: a knowledge of classical antiquity is scientific when the remains of classical antiquity are correctly studied in the original languages." There can be no doubt that Wolf is perfectly right; that all learning is scientific which is systematically laid out and followed up to its original sources, and that a genuine humanism is scientific.

When I speak of knowing Greek and Roman antiquity, therefore, as a help to knowing ourselves and the world, I mean more than a knowledge of so much vocabulary, so much grammar, so many portions of authors in the Greek and Latin languages. I mean knowing the Greeks and Romans, and their life and genius, and what they were and did in the world; what we get from them, and what is its value. That, at least, is the ideal; and when we talk of endeavouring to know Greek and Roman antiquity, as a help to knowing ourselves and the world, we mean endeavouring so to know them as to satisfy this ideal, however much we may still fall short of it.

The same also as to knowing our own and other modern nations with the like aim of getting to understand ourselves and the world. To know the best that has been thought and said by the modern nations, is to know, says Professor Huxley, "only what modern literatures have to tell us; it is the criticism of life contained in modern literature." And yet "the distinctive character of our times," he urges, "lies in the vast and constantly increasing part which is played by natural knowledge." And how, therefore, can a man, devoid of knowledge of what physical science has done in the last century enter hopefully upon a criticism of modern life?

Let us, I say, be agreed about the meaning of the terms we are using. I talk of knowing the best which has been thought and uttered in the world; Professor Huxley says this means knowing literature. Literature is a large word; it may mean everything written with letters or printed in a book. Euclid's Elements and Newton's Principia are thus literature. All knowledge that reaches us through books is literature. But by literature Professor Huxley means belles lettres. He means to make me say, that knowing the best which has been thought and said by the modern nations is knowing their belles lettres and no more. And this is no sufficient equipment, he argues, for a criticism of modern life. But as I do not mean, by knowing ancient Rome, knowing merely more or less of Latin belles lettres, and taking no account of Rome's military, and political, and legal, and. administrative work in the world; and as, by knowing ancient Greece, I understand knowing her as the giver of Greek art, and the guide to a free and right use of reason and to scientific method, and the founder of our mathematics and physics and astronomy and biology,—I understand knowing her as all

this, and not merely knowing certain Greek poems, and histories, and treatises, and speeches,—so as to the knowledge of modern nations also. By knowing modern nations, I mean not merely knowing their belles lettres, but knowing also what has been done by such men as Copernicus, Galileo, Newton, Darwin. "Our ancestors learned," says Professor Huxley, "that the earth is the centre of the visible universe, and that man is the cynosure of things terrestrial; and more especially was it inculcated that the course of nature had no fixed order but that it could be, and constantly was, altered." But for us now continues Professor Huxley, "the notions of the beginning and the end of the world entertained by our forefathers are no longer credible. It is very certain that the earth is not the chief body in the material universe, and that the world is not subordinated to man's use. It is even more, certain that nature is the expression of a definite order, with which nothing interferes." "And yet," he cries, "the purely classical education advocated by the representatives of the humanists in Our day gives no inkling of all this!"

In due place and time I will just touch upon that vexed question of classical education; but at present the question is as to what is meant by knowing the best which modern nations have thought and said. It is not knowing their belles lettres merely which is meant. To know Italian belles lettres is not to know Italy, and to know English belles lettres is not to know England. Into knowing Italy and England there comes a great deal more, Galileo and Newton, amongst it. The reproach of being a superficial humanism, a tincture of belles lettres, may attach rightly enough to some other disciplines; but to the particular discipline recommended when I proposed knowing the best that has been thought and said in the world, it does not apply. In that best I certainly include what in modern times has been thought and said by the great observers and knowers of nature.

There is, therefore, really no question between Professor Huxley and me as to whether knowing the great results of the modern scientific study of nature is not required as a part of our culture, as well as knowing the products of literature and art. But to follow the processes by which those results are reached, ought, say the friends of physical science, to be made the staple of education for the bulk of mankind. And here there does arise a question between those whom Professor Huxley calls with playful sarcasm "the Levites of culture," and those whom the poor humanist is sometimes apt to regard as its Nebuchadnezzars.

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 reached and established, are interesting. All knowledge is interesting to a wise man, and the knowledge of nature is interesting to all men. It is very interesting to know, that, from the albuminous white of the egg, the chick in the egg gets the materials for its flesh, bones, blood, and feathers; while, from the fatty yolk of the egg, it gets the heat and energy which enable it at length to break its shell and begin the world. It is less interesting, perhaps, but still it is interesting, to know that when a taper burns, the wax is converted into carbonic acid and water. Moreover, it is quite true that the habit of dealing with facts, which is given by the study of nature, is, as the friends of physical science praise it for being, an excellent discipline. The appeal, in the study of nature, is constantly to observation and experiment; not only is it said that the thing is so, but we can be made to see that it is so. Not only does a man tell us that when a taper burns the wax is converted into carbonic acid and water, as a man may tell us, if he likes, that Charon is punting his ferry-boat on the river Styx, or that Victor Hugo is a sublime poet, or Mr. Gladstone the most admirable of statesmen; but we are made to see that the conversion into carbonic acid and water does actually happen. This reality of natural knowledge it is, which makes the friends of physical science contrast it, as a knowledge of things, with the humanist's knowledge, which is, say they, a knowledge of words. And hence Professor Huxley is moved to lay it down that, "for the purpose of attaining real culture, an exclusively scientific education is at least as effectual as an exclusively literary education." And 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 mental training, "has substituted literature and history for natural science, he

has chosen the less useful alternative." But whether we go 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.

More than this, however, is demanded by the reformers. 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 own acquaintance with the disciplines of natural science is ever before my mind, and I am fearful of doing these disciplines an injustice. The ability and pugnacity of the partisans of natural science make 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. But I put this forward upon the strength of some facts not at all recondite, very far from it; facts capable of being stated in the simplest possible fashion, and to which, if I so state them, the man of science will, I am sure, be willing to allow their due weight.

Deny the facts altogether, I think, he hardly can. He can hardly deny, that when we set ourselves to enumerate the powers which go to the building up of human life, and say that they are the power of conduct, the power of intellect and knowledge, the power of beauty, and the power of social life and manners,—he can hardly deny that this scheme, though drawn in rough and plain lines enough, and not pretending to scientific exactness, does yet give a fairly true representation of the matter. Human nature is built up by these powers; we have the need for them all. When we have rightly met and adjusted the claims of them all, we shall then be in a fair way for getting soberness and righteousness, with wisdom. This is evident enough, and the friends of physical science would admit it.

But perhaps they may not have sufficiently observed another thing: namely, that the several powers just mentioned are not isolated, but there is, in the generality of mankind, a perpetual tendency to relate them one to another in divers ways. With one such way of relating them I am particularly concerned now. Following our instinct for intellect and knowledge, we acquire pieces of knowledge; and presently, in the generality of men, there arises the desire to relate these pieces of knowledge to our sense for conduct, to our sense for beauty,--and there is weariness and dissatisfaction if the desire is baulked. Now in this desire lies, I think, the strength of that hold which letters have upon us.

All knowledge is, as I said just now, interesting; and even items of knowledge which from the nature of the case cannot well be related, but must stand isolated in our thoughts, have their interest. Even lists of exceptions have their interest. If we are studying Greek accents, it is interesting to know that pais and pas, and some other monosyllables of the same form of declension, do not take the circumflex upon the last syllable of the genitive plural, but vary, in this respect, from the common rule. If we are studying physiology, it is interesting to know that the pulmonary artery carries dark blood and the pulmonary vein carries bright blood, departing in this respect from the common rule for the division of labour between the veins and the arteries. But every one knows how we seek naturally to combine the pieces of our knowledge together, to bring them under general rules, to relate them to principles; and how unsatisfactory and tiresome it would be to go on for ever learning lists of exceptions, or accumulating items of fact which must stand isolated.

Well, that same need of relating our knowledge, which operates here within the sphere of our knowledge itself, we shall find operating, also, outside that sphere. We experience, as we go on learning and knowing,--the vast majority of us experience,— the need of relating what we have learnt and known to the sense which we have in us for conduct, to the sense which we have in us for beauty.

A certain Greek prophetess of Mantineia in Arcadia, Diotima by name, once explained to the philosopher Socrates that love, and impulse, and bent of all kinds, is, in fact, nothing else but the desire in men that good should for ever be present to them. This desire for good, Diotima assured Socrates, is our fundamental desire, of which fundamental desire every impulse in us is only some one particular form. And therefore this fundamental desire it is, I suppose,—this desire in men that good should be for ever present to them,—which acts in us when we feel the impulse for relating our knowledge to our sense for conduct and to our sense for beauty. At any rate, with men in general the instinct exists. Such is human nature. And the instinct, it will be admitted, is innocent, and human nature is preserved by our following the lead of its innocent instincts. Therefore, in seeking to gratify this instinct in question, we are following the instinct of self-preservation in humanity.

But, no doubt, some kinds of knowledge cannot be made to directly serve the instinct in question, cannot be directly related to the sense for beauty, to the sense for conduct. These are instrument-knowledges; they lead on to other knowledges, which can. A man who passes his life in instument-knowledges is a specialist. They may be invaluable as instruments to something beyond, for those who have the gift thus to employ them; and they may be disciplines m themselves wherein it is useful for every one to have some schooling. But it is inconceivable that the generality of men should pass all their mental life with Greek accents or with formal logic. My friend Professor Sylvester, who is one of the first mathematicians in the world, holds transcendental doctrines as to the virtue of mathematics, but those doctrines are not for common men. In the very Senate House and heart of our English Cambridge I once ventured, though not without an apology for my profaneness, to hazard the opinion that for the majority of mankind a little of mathematics, even, 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.

The natural sciences do not, however, stand on the same footing with these instrument-knowledges. Experience shows us that the generality of men will find more interest in learning that, when a taper burns, the wax is converted into carbonic acid and water, or in learning the explanation of the phenomenon of dew, or in learning how the circulation of the blood is carried on, than they find in learning that the genitive plural of pais and pas does not take the circumflex on the termination. And one piece of natural knowledge is added to another, and others are added to that, and at last we come to propositions so interesting as Mr. Darwin's famous proposition that "our ancestor was a hairy quadruped furnished with a tail and pointed ears, probably arboreal in his habits." Or we come to propositions of such reach and magnitude as those which Professor Huxley delivers, when he says that the notions of our forefathers about the beginning and the end of the world were all wrong, and that nature is the expression of a definite order with which nothing interferes.

Interesting indeed, these results of science are, important they are, I and we should all of us be acquainted with them. But what I now I wish you to mark is, that we are still, when they are propounded to us and we receive them, we are still in the sphere of intellect and knowledge. And for the generality of men there will be found, I say, to arise, when they have duly taken in the proposition that their ancestor was "a hairy quadruped furnished with a tail and pointed ears, probably arboreal in his habits," there will be found to arise an invincible desire to relate this proposition to the sense in us for conduct, and to the sense in us for beauty. But this the men of science will not do for us, and will hardly even profess to do. They will give us other pieces of knowledge, other facts, about other animals and their ancestors, or about plants, or about stones, or about stars; and they may finally bring us to those great "general conceptions of the universe, which are forced upon us all," says Professor Huxley, "by the progress of physical science." But still it will be knowledge only which they give us, knowledge not put 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.

Not to the born naturalist, I admit. But what do we mean by a born naturalist? We mean a man in whom the zeal for observing nature is so uncommonly strong and eminent, that it marks him off from the bulk of mankind. Such a man will pass his life happily in collecting natural knowledge and reasoning upon it, and will ask for nothing, or hardly anything, more. I have heard it said that the sagacious and admirable naturalist whom we lost not very long ago, 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,— religion and poetry; science and the domestic affections, he thought, were enough. To a born naturalist, I can well understand that this should seem so. So absorbing is his occupation with nature, so strong his love for his occupation, that he goes on acquiring natural knowledge and reasoning upon it, and has little time or inclination for thinking about getting it related to the desire in man for conduct, the desire in man for beauty. He relates it to them for himself as he goes along, so far as he feels the need; and he draws from the domestic affections all the additional solace necessary. But then Darwins are extremely rare. Another great and admirable master of natural knowledge, Faraday, was a Sandemainian. That is to say he related his knowledge to his instinct for conduct and to his instinct for beauty, by the aid off that respectable Scottish sectary Robert Sandeman. And so strong, in general, is the demand of religion and poetry to have their share in a man, to associate themselves with his knowing, and to relieve and rejoice it, that, probably, for one man amongst us with the disposition to do as Darwin did in this respect there are at least fifty with the disposition to do as Faraday.

Education lays hold upon us, in fact, by satisfying this demand. Professor Huxley holds up to scorn mediaeval education, with its neglect of the knowledge of nature, its poverty even of literary studies, its formal logic devoted to "showing how and why that which the Church said was true must be true." But the great mediaeval Universities were not brought into being we may be sure, by the zeal for giving a jejune and contemptible education. Kings have been their nursing fathers, and queens have been their nursing mothers, but not for this. The mediaeval Universities came into being, because the supposed knowledge, delivered by Scripture and the Church, so deeply engaged men's hearts, by so simply, easily, and powerfully relating itself to their desire for conduct, their desire for beauty. All other knowledge was dominated by this supposed knowledge and was subordinated to it, because of the surpassing strength of the hold which it "aimed upon the affections of men, by allying itself profoundly with their sense for conduct their sense for beauty."

But now, says Professor Huxley, conceptions of the universe fatal to the notions held by our forefathers have been forced upon us by physical science. Grant to him shalt they are thus fatal, that the new conceptions must and will soon become current everywhere, and that every one will finally perceive them to be fatal to the beliefs of our forefathers. The need of humane letters, as they are truly called, because they serve the paramount desire in men that good should be for ever present to them,—the need of humane letters, to establish a relation between the new conceptions, and our instinct for beauty our instinct for conduct, is only the more visible. The Middle Age could do without humane letters, as it could do without the study of nature, because its supposed knowledge was made to engage its emotions so powerfully. Grant that the supposed knowledge disappears its power of being made to engage the emotions will of course disappear along with it,—but the emotions themselves, and their claim to be engaged and satisfied, will remain. Now if we find by experience that humane letters have an undeniable power of engaging the emotions, the importance of humane letters in a man's training becomes not less, but greater, in proportion to the success of modern science in extirpating what it calls "mediaeval thinking."

Have humane letters, then, have poetry and eloquence, the power here attributed to them of engaging the emotions, and do they exercise it? And if they have it and exercise it, how do they exercise it, so as to exert an influence upon man's sense for conduct, his sense for beauty? Finally, even if they both can and do exert an influence upon the senses in question, how are they to relate to them the results. —the modern

results,—of natural science? All these questions may be asked. First, have poetry and eloquence the power of calling out the emotions? The appeal is to experience. Experience shows that for the vast majority of men, for mankind in general, they have the power. Next, do they exercise it? They do. But then, how do they exercise it so as to affect man's sense for conduct, his sense for beauty? And this is perhaps a case for applying the Preacher's words: "Though a man labour to seek it out, yet he shall not find it; yea, farther, though a wise man think to know it, yet shall he not be able to find it." Why should it be one thing, in its effect upon the emotions, to say, "Patience is a virtue," and quite another thing, in its effect upon the emotions, to say with Homer,

τλητον γαρ Μοιραι θυμον θεσαν ανθρωποισιν

"for an enduring heart have the destinies appointed to the children of men"? Why should it be one thing, in its effect upon the emotions, to say with the philosopher Spinoza, Felicitas in eo consistit quod homo suum esse conservare potest—"Man's happiness consists in his being able to preserve his own essence," and quite another thing, in its effect upon the emotions, to say with the Gospel, "What is a man advantaged, if he gain the whole world, and lose himself, forfeit himself?" How does this difference of effect arise? I cannot tell, and I am not much concerned to know; the important thing is that it does arise, and that we can profit by it. But how, finally, are poetry and eloquence to exercise the power of relating the modern results of natural science to man's instinct for conduct, his instinct for beauty? And here again I answer that I do not know how they will exercise it, but that they can and will exercise it I am sure. I do not mean that modern philosophical poets and modern philosophical moralists are to come and relate for us, in express terms, the results of modern scientific research to our instinct for conduct, our instinct for beauty. But I mean that we shall find, as a matter of experience, if we know the best that has been thought and uttered in the world, we shall find that the art and poetry and eloquence of men who lived, perhaps, long ago, who had the most limited natural knowledge, who had the most erroneous conceptions about many important matters, we shall find that this art, and poetry, and eloquence, have in fact not only the power of refreshing and delighting us, they have also the power,— such is the strength and worth, in essentials, of their authors' criticism of life,—they have a fortifying, and elevating, and quickening, and suggestive power, capable of wonderfully helping us to relate the results of modern science to our need for conduct, our need for beauty. Homer's conceptions of the physical universe were, I imagine, grotesque; but really, under the shock of hearing from modern science that "the world is not subordinated to man's use, and that man is not the cynosure of things terrestrial," I could, for my own part, desire no better comfort than Homer's line which I quoted just now,

τλητον γαρ Μοιραι θυμον θεσαν ανθρωποισιν

"for an enduring heart have the destinies appointed to the children of men!"

And the more that men's minds are cleared, the more that the results of science are frankly accepted, the more that poetry and eloquence come to be received and studied as what in truth they really are,— the criticism of life by gifted men, alive and active with extraordinary power at an unusual number of points;—so much the more will the value of humane letters, and of art also, which is an utterance having a like kind of power with theirs, be felt and acknowledged, and their place in education be secured.

Let us therefore, all of us, avoid indeed as much as possible any invidious comparison between the merits of humane letters, as means of education, and the merits of the natural sciences. But when some President of a Section for Mechanical Science insists on making the comparison, and tells us that "he who in his training has substituted literature and history for natural science has chosen the less useful alternative," let us make answer to him that the student of humane letters only, will, at least, know also the great general conceptions brought in by modern physical science; for science, as Professor Huxley says, forces them upon us all. But the student of the natural sciences only, will, by our very hypothesis, know nothing of humane letters; not to mention that in setting himself to be perpetually accumulating natural knowledge, he sets himself to do what only specialists have in general the gift for doing genially. And so he will probably be unsatisfied, or at any rate incomplete, and even more incomplete than the student of humane letters only.

I once mentioned in a school-report, how a young man in one of our English training colleges having to paraphrase the passage in Macbeth beginning,

Can'st thou not minister to a mind diseased?
turned this line into, "Can you not wait upon the lunatic?" And I remarked what a curious state of things it would be, if every pupil of our national schools knew, let us say, that the moon is two thousand one hundred and sixty miles in diameter, and thought at the same time that a good paraphrase for
Can'st thou not minister to a mind diseased?
was, "Can you not wait upon the lunatic?" If one is driven to choose, I think I would rather have a young person ignorant about the moon's diameter, but aware that "Can you not wait upon the lunatic?" is bad, than a young person whose education had been such as to manage things the other way.
Or to go higher than the pupils of our national schools. I have in my mind's eye a member of our British Parliament who comes to travel here in America, who afterwards relates his travels, and who shows a really masterly knowledge of the geology of this great country and of its mining capabilities, but who ends by gravely suggesting that the United States should borrow a prince from our Royal Family, and should make him their king, and should create a House of Lords of great landed proprietors after the pattern of ours; and then America, he thinks, would have her future happily and perfectly secured. Surely, in this case, the President of the Section for Mechanical Science would himself hardly say that our member of Parliament, by concentrating himself upon geology and mineralogy, and so on, and not attending to literature and history, had "chosen the more useful alternative."

If then 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, I cannot but think, 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.

I said that before I ended I would just touch on the question of classical education, and I will keep my word. Even if literature is to retain a large place in our education, yet Latin and Greek, say the friends of progress, will certainly have to go. Greek is the grand offender in the eyes of these gentlemen. The attackers of the established course of study think that against Greek, at any rate, they have irresistible arguments. Literature may perhaps be needed in education, they say; but why on earth should it be Greek literature? Why not French or German? Nay, "has not an Englishman models in his own literature of every kind of excellence?" As before, it is not on any weak pleadings of my own that I rely for convincing the gainsayers; it is on the constitution of human nature itself, and on the instinct of self-preservation in humanity. The instinct for beauty is set in human nature, as surely as the instinct for knowledge is set there, or the instinct for conduct. If the instinct for beauty is served by Greek literature and art as it is served by no other literature and art, we may trust to the instinct of self-preservation in humanity for keeping Greek as part of our culture. We may trust to it for even making the study of Greek more prevalent than it is now. Greek will come, I hope, some day to be studied more rationally than at present; but it will be increasingly studied as men increasingly feel the need in them for beauty, and how powerfully Greek art and Greek literature can serve this need. Women will again study Greek, as Lady Jane Grey did; I believe that in that chain of forts, with which the fair host of the Amazons are now engirdling our English universities, I find that here in America, in colleges like Smith College in Massachusetts, and Vassar College in the State of New York, and in the happy families of the mixed universities out West, they are studying it already.

Defuit una mihi symmetria prisca, -- "The antique symmetry was the one thing wanting to me," said Leonardo da Vinci; and he was an Italian. I will not presume to speak for the Americans, but I am sure that, in the Englishman, the want of this admirable symmetry of the Greeks is a thousand times more great and

crying than in any Italian. The results of the want show themselves most glaringly, perhaps, in our architecture, but they show themselves, also, in all our art. Fit details strictly combined, in view of a large general result nobly conceived; that is just the beautiful symmetria prisca of the Greeks, and it is just where we English fail, where all our art fails. Striking ideas we have, and well-executed details we have; but that high symmetry which, with satisfying and delightful effect, combines them, we seldom or never have. The glorious beauty of the Acropolis at Athens did not come from single fine things stuck about on that hill, a statue here, a gateway there;—no, it arose from all things being perfectly combined for a supreme total effect. What must not an Englishman feel about our deficiencies in this respect, as the sense for beauty, whereof this symmetry is an essential element, awakens and strengthens within him! what will not one day be his respect and desire for Greece and its symmetria prisca, when the scales drop from his eyes as he walks the London streets, and he sees such a lesson in meanness as the Strand, for instance, in its true deformity! But here we are coming to our friend Mr. Ruskin's province, and I will not intrude upon it, for he is its very sufficient guardian.

And so we at last find, it seems, we find flowing in favour of the humanities the natural and necessary stream of things, which seemed against them when we started. The "hairy quadruped furnished with a tail and pointed ears, probably arboreal in his habits," this good fellow carried hidden in his nature, apparently, something destined to develop into a necessity for humane letters. Nay, more; we seem finally to be even led to the further conclusion that our hairy ancestor carried in his nature, also, a necessity for Greek.

And therefore, to say the truth, I cannot really think that humane letters are in much actual 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. As with Greek, so with letters generally: they will some day come, we may hope, to be studied more rationally, but they will not lose their place. What will happen will rather be that there will 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.

1 Not the Rede lecture, Cambridge University, 1882, in reply to Thomas H. Huxley's "Science and Culture," delivered in Birmingham on October 1, 1880. That essay was published in The Nineteenth Century (August 1882). See copy in Trinity College library. Arnold gave the later address presented here in 1883 while in America.