

Why, How, and When Should We Learn?

Selections from *Metaphysics*, *Posterior Analytics*, and *Politics*

Aristotle

The following section includes comments from three of Aristotle's books. The sections are ordered from the most abstract to the most concrete. 1) Why do men desire to know? 2) How do we know that we know? 3) What obligations do societies have to educate?

Metaphysics

Book 1

In this section of the Metaphysics, Aristotle argues for several conclusions 1) humans have a natural desire to want to know. 2) we must be more sure of the premises of an argument than its conclusion. 3) all scientific knowledge is the result of demonstration (logical proof).

Part 1

"ALL men by nature desire to know. An indication of this is the delight we take in our senses; for even apart from their usefulness they are loved for themselves; and above all others the sense of sight. For not only with a view to action, but even when we are not going to do

anything, we prefer seeing (one might say) to everything else. The reason is that this, most of all the senses, makes us know and brings to light many differences between things.

"By nature animals are born with the faculty of sensation, and from sensation memory is produced in some of them, though not in others. And therefore the former are more intelligent and apt at learning than those which cannot remember; those which are incapable of hearing sounds are intelligent though they cannot be taught, e.g. the bee, and any other race of animals that may be like it; and those which besides memory have this sense of hearing can be taught.

"The animals other than man live by appearances and memories, and have but little of connected experience; but the human race lives also by art and reasonings. Now from memory experience is produced in men; for the several memories of the same thing produce finally the capacity for a single experience. And experience seems pretty much like science and art, but really science and art come to men through experience; for 'experience made art', as Polus says, 'but inexperience luck.' Now art arises when from many notions gained by experience one universal judgement about a class of objects is produced. For to have a judgement that when Callias was ill of this disease this did him good, and similarly in the case of Socrates and in many individual cases, is a matter of experience; but to judge that it has done good to all persons of a certain constitution, marked off in one class, when they were ill of this disease, e.g. to phlegmatic or bilious people when burning with fevers-this is a matter of art.

"With a view to action experience seems in no respect inferior to art, and men of experience succeed even better than those who have theory without experience. (The reason is that experience is knowledge of individuals, art of universals, and actions and productions are all concerned with the individual; for the physician does not cure man, except in an incidental way, but Callias or Socrates or some other called by some such individual name, who

happens to be a man. If, then, a man has the theory without the experience, and recognizes the universal but does not know the individual included in this, he will often fail to cure; for it is the individual that is to be cured.) But yet we think that knowledge and understanding belong to art rather than to experience, and we suppose artists to be wiser than men of experience (which implies that Wisdom depends in all cases rather on knowledge); and this because the former know the cause, but the latter do not. For men of experience know that the thing is so, but do not know why, while the others know the 'why' and the cause. Hence we think also that the masterworkers in each craft are more honourable and know in a truer sense and are wiser than the manual workers, because they know the causes of the things that are done (we think the manual workers are like certain lifeless things which act indeed, but act without knowing what they do, as fire burns,-but while the lifeless things perform each of their functions by a natural tendency, the labourers perform them through habit); thus we view them as being wiser not in virtue of being able to act, but of having the theory for themselves and knowing the causes. And in general it is a sign of the man who knows and of the man who does not know, that the former can teach, and therefore we think art more truly knowledge than experience is; for artists can teach, and men of mere experience cannot.

"Again, we do not regard any of the senses as Wisdom; yet surely these give the most authoritative knowledge of particulars. But they do not tell us the 'why' of anything-e.g. why fire is hot; they only say that it is hot.

"At first he who invented any art whatever that went beyond the common perceptions of man was naturally admired by men, not only because there was something useful in the inventions, but because he was thought wise and superior to the rest. But as more arts were invented, and some were directed to the necessities of life, others to recreation, the inventors of the latter were naturally always regarded as wiser than the inventors of the former, because their branches of

knowledge did not aim at utility. Hence when all such inventions were already established, the sciences which do not aim at giving pleasure or at the necessities of life were discovered, and first in the places where men first began to have leisure. This is why the mathematical arts were founded in Egypt; for there the priestly caste was allowed to be at leisure.

"We have said in the Ethics what the difference is between art and science and the other kindred faculties; but the point of our present discussion is this, that all men suppose what is called Wisdom to deal with the first causes and the principles of things; so that, as has been said before, the man of experience is thought to be wiser than the possessors of any sense-perception whatever, the artist wiser than the men of experience, the masterworker than the mechanic, and the theoretical kinds of knowledge to be more of the nature of Wisdom than the productive. Clearly then Wisdom is knowledge about certain principles and causes.

Part 2

"Since we are seeking this knowledge, we must inquire of what kind are the causes and the principles, the knowledge of which is Wisdom. If one were to take the notions we have about the wise man, this might perhaps make the answer more evident. We suppose first, then, that the wise man knows all things, as far as possible, although he has not knowledge of each of them in detail; secondly, that he who can learn things that are difficult, and not easy for man to know, is wise (sense-perception is common to all, and therefore easy and no mark of Wisdom); again, that he who is more exact and more capable of teaching the causes is wiser, in every branch of knowledge; and that of the sciences, also, that which is desirable on its own account and for the sake of knowing it is more of the nature of Wisdom than that which is desirable on account of its results, and the superior science is more of the nature of Wisdom than the ancillary; for the wise man must not be ordered but must order, and he must not obey another,

but the less wise must obey him.

"Such and so many are the notions, then, which we have about Wisdom and the wise. Now of these characteristics that of knowing all things must belong to him who has in the highest degree universal knowledge; for he knows in a sense all the instances that fall under the universal. And these things, the most universal, are on the whole the hardest for men to know; for they are farthest from the senses. And the most exact of the sciences are those which deal most with first principles; for those which involve fewer principles are more exact than those which involve additional principles, e.g. arithmetic than geometry. But the science which investigates causes is also instructive, in a higher degree, for the people who instruct us are those who tell the causes of each thing. And understanding and knowledge pursued for their own sake are found most in the knowledge of that which is most knowable (for he who chooses to know for the sake of knowing will choose most readily that which is most truly knowledge, and such is the knowledge of that which is most knowable); and the first principles and the causes are most knowable; for by reason of these, and from these, all other things come to be known, and not these by means of the things subordinate to them. And the science which knows to what end each thing must be done is the most authoritative of the sciences, and more authoritative than any ancillary science; and this end is the good of that thing, and in general the supreme good in the whole of nature. Judged by all the tests we have mentioned, then, the name in question falls to the same science; this must be a science that investigates the first principles and causes; for the good, i.e. the end, is one of the causes.

"That it is not a science of production is clear even from the history of the earliest philosophers. For it is owing to their wonder that men both now begin and at first began to philosophize; they wondered originally at the obvious difficulties, then advanced little by little and stated difficulties about the greater matters, e.g. about the phenomena of the moon and those of the sun and of the stars, and

about the genesis of the universe. And a man who is puzzled and wonders thinks himself ignorant (whence even the lover of myth is in a sense a lover of Wisdom, for the myth is composed of wonders); therefore since they philosophized order to escape from ignorance, evidently they were pursuing science in order to know, and not for any utilitarian end. And this is confirmed by the facts; for it was when almost all the necessities of life and the things that make for comfort and recreation had been secured, that such knowledge began to be sought. Evidently then we do not seek it for the sake of any other advantage; but as the man is free, we say, who exists for his own sake and not for another's, so we pursue this as the only free science, for it alone exists for its own sake...

Posterior Analytics

Book 1

This second section is from Aristotle's work that focuses heavily on categorizing the kinds of things that can be known and how we know them. This passage begins with his opening comments on Scientific knowledge. He proceeds into defining a host of terms that will become central to philosophy especially medieval and 20th century analytic Philosophy.

Part 2

We suppose ourselves to possess unqualified scientific knowledge of a thing, as opposed to knowing it in the accidental way in which the sophist knows, when we think that we know the cause on which the fact depends, as the cause of that fact and of no other, and, further, that the fact could not be other than it is. Now that scientific knowing is something of this sort is evident—witness both those who falsely claim it and those who actually possess it, since the former merely imagine themselves to be, while the latter are also actually, in the

condition described. Consequently the proper object of unqualified scientific knowledge is something which cannot be other than it is. There may be another manner of knowing as well—that will be discussed later. What I now assert is that at all events we do know by demonstration. By demonstration I mean a syllogism productive of scientific knowledge, a syllogism, that is, the grasp of which is eo ipso such knowledge. Assuming then that my thesis as to the nature of scientific knowing is correct, the premises of demonstrated knowledge must be true, primary, immediate, better known than and prior to the conclusion, which is further related to them as effect to cause. Unless these conditions are satisfied, the basic truths will not be 'appropriate' to the conclusion. Syllogism there may indeed be without these conditions, but such syllogism, not being productive of scientific knowledge, will not be demonstration. The premises must be true: for that which is non-existent cannot be known—we cannot know, e.g. that the diagonal of a square is commensurate with its side. The premises must be primary and indemonstrable; otherwise they will require demonstration in order to be known, since to have knowledge, if it be not accidental knowledge, of things which are demonstrable, means precisely to have a demonstration of them. The premises must be the causes of the conclusion, better known than it, and prior to it; its causes, since we possess scientific knowledge of a thing only when we know its cause; prior, in order to be causes; antecedently known, this antecedent knowledge being not our mere understanding of the meaning, but knowledge of the fact as well. Now 'prior' and 'better known' are ambiguous terms, for there is a difference between what is prior and better known in the order of being and what is prior and better known to man. I mean that objects nearer to sense are prior and better known to man; objects without qualification prior and better known are those further from sense. Now the most universal causes are furthest from sense and particular causes are nearest to sense, and they are thus exactly opposed to one another. In saying that the premises of demonstrated knowledge must be primary, I mean that they must be the 'appropriate' basic truths, for I identify primary premise and basic truth. A 'basic truth' in a

demonstration is an immediate proposition. An immediate proposition is one which has no other proposition prior to it. A proposition is either part of an enunciation, i.e. it predicates a single attribute of a single subject. If a proposition is dialectical, it assumes either part indifferently; if it is demonstrative, it lays down one part to the definite exclusion of the other because that part is true. The term 'enunciation' denotes either part of a contradiction indifferently. A contradiction is an opposition which of its own nature excludes a middle. The part of a contradiction which conjoins a predicate with a subject is an affirmation; the part disjoining them is a negation. I call an immediate basic truth of syllogism a 'thesis' when, though it is not susceptible of proof by the teacher, yet ignorance of it does not constitute a total bar to progress on the part of the pupil: one which the pupil must know if he is to learn anything whatever is an axiom. I call it an axiom because there are such truths and we give them the name of axioms par excellence. If a thesis assumes one part or the other of an enunciation, i.e. asserts either the existence or the non-existence of a subject, it is a hypothesis; if it does not so assert, it is a definition. Definition is a 'thesis' or a 'laying something down', since the arithmetician lays it down that to be a unit is to be quantitatively indivisible; but it is not a hypothesis, for to define what a unit is, is not the same as to affirm its existence. Now since the required ground of our knowledge—i.e. of our conviction—of a fact is the possession of such a syllogism as we call demonstration, and the ground of the syllogism is the facts constituting its premises, we must not only know the primary premises—some if not all of them—beforehand, but know them better than the conclusion: for the cause of an attribute's inherence in a subject always itself inheres in the subject more firmly than that attribute; e.g. the cause of our loving anything is dearer to us than the object of our love. So since the primary premises are the cause of our knowledge—i.e. of our conviction—it follows that we know them better—that is, are more convinced of them—than their consequences, precisely because of our knowledge of the latter is the effect of our knowledge of the premises. Now a man cannot believe in anything more than in the things he knows, unless he has either

actual knowledge of it or something better than actual knowledge. But we are faced with this paradox if a student whose belief rests on demonstration has not prior knowledge; a man must believe in some, if not in all, of the basic truths more than in the conclusion. Moreover, if a man sets out to acquire the scientific knowledge that comes through demonstration, he must not only have a better knowledge of the basic truths and a firmer conviction of them than of the conclusion which is being demonstrated: more than this, nothing must be more certain or better known to him than these basic truths in their character as contradicting the fundamental premises which lead to the opposed and erroneous conclusion. For indeed the conviction of pure science must be unshakable.

Politics

Book 8

In this section of the politics Aristotle turns his attention to the topic of why a society should institute a public education system. His arguments hinge on the idea that the society is prior to the individual in the sense that if you were to destroy the society you would destroy the individual. Therefore, no individual belongs to himself and his thriving is important to the state.

Part 1

None will doubt that the legislator should direct his attention above all to the education of youth; for the neglect of education does harm to the constitution. The citizen should be molded to suit the form of government under which he lives. For each government has a peculiar character which originally formed and which continues to preserve it. The character of democracy creates democracy, and the character of oligarchy creates oligarchy; and always the better the character, the better the government.

Again, for the exercise of any faculty or art a previous training and habituation are required; clearly therefore for the practice of virtue. And since the whole city has one end, it is manifest that education should be one and the same for all, and that it should be public, and not private- not as at present, when every one looks after his own children separately, and gives them separate instruction of the sort which he thinks best; the training in things which are of common interest should be the same for all. Neither must we suppose that any one of the citizens belongs to himself, for they all belong to the state, and are each of them a part of the state, and the care of each part is inseparable from the care of the whole. In this particular as in some others the Lacedaemonians are to be praised, for they take the greatest pains about their children, and make education the business of the state.

Part II

That education should be regulated by law and should be an affair of state is not to be denied, but what should be the character of this public education, and how young persons should be educated, are questions which remain to be considered. As things are, there is disagreement about the subjects. For mankind are by no means agreed about the things to be taught, whether we look to virtue or the best life. Neither is it clear whether education is more concerned with intellectual or with moral virtue. The existing practice is perplexing; no one knows on what principle we should proceed- should the useful in life, or should virtue, or should the higher knowledge, be the aim of our training; all three opinions have been entertained. Again, about the means there is no agreement; for different persons, starting with different ideas about the nature of virtue, naturally disagree about the practice of it. There can be no doubt that children should be taught those useful things which are really necessary, but not all useful things; for occupations are divided into liberal and illiberal; and to young children should be imparted only such kinds of knowledge as will be useful to them without vulgarizing them. And any occupation,

art, or science, which makes the body or soul or mind of the freeman less fit for the practice or exercise of virtue, is vulgar; wherefore we call those arts vulgar which tend to deform the body, and likewise all paid employments, for they absorb and degrade the mind. There are also some liberal arts quite proper for a freeman to acquire, but only in a certain degree, and if he attend to them too closely, in order to attain perfection in them, the same evil effects will follow. The object also which a man sets before him makes a great difference; if he does or learns anything for his own sake or for the sake of his friends, or with a view to excellence the action will not appear illiberal; but if done for the sake of others, the very same action will be thought menial and servile. The received subjects of instruction, as I have already remarked, are partly of a liberal and party of an illiberal character.

Part III

The customary branches of education are in number four; they are- (1) reading and writing, (2) gymnastic exercises, (3) music, to which is sometimes added (4) drawing. Of these, reading and writing and drawing are regarded as useful for the purposes of life in a variety of ways, and gymnastic exercises are thought to infuse courage. concerning music a doubt may be raised- in our own day most men cultivate it for the sake of pleasure, but originally it was included in education, because nature herself, as has been often said, requires that we should be able, not only to work well, but to use leisure well; for, as I must repeat once again, the first principle of all action is leisure. Both are required, but leisure is better than occupation and is its end; and therefore the question must be asked, what ought we to do when at leisure? Clearly we ought not to be amusing ourselves, for then amusement would be the end of life. But if this is inconceivable, and amusement is needed more amid serious occupations than at other times (for he who is hard at work has need of relaxation, and amusement gives relaxation, whereas occupation is always accompanied with exertion and effort), we should introduce

amusements only at suitable times, and they should be our medicines, for the emotion which they create in the soul is a relaxation, and from the pleasure we obtain rest. But leisure of itself gives pleasure and happiness and enjoyment of life, which are experienced, not by the busy man, but by those who have leisure. For he who is occupied has in view some end which he has not attained; but happiness is an end, since all men deem it to be accompanied with pleasure and not with pain. This pleasure, however, is regarded differently by different persons, and varies according to the habit of individuals; the pleasure of the best man is the best, and springs from the noblest sources. It is clear then that there are branches of learning and education which we must study merely with a view to leisure spent in intellectual activity, and these are to be valued for their own sake; whereas those kinds of knowledge which are useful in business are to be deemed necessary, and exist for the sake of other things. And therefore our fathers admitted music into education, not on the ground either of its necessity or utility, for it is not necessary, nor indeed useful in the same manner as reading and writing, which are useful in money-making, in the management of a household, in the acquisition of knowledge and in political life, nor like drawing, useful for a more correct judgment of the works of artists, nor again like gymnastic, which gives health and strength; for neither of these is to be gained from music. There remains, then, the use of music for intellectual enjoyment in leisure; which is in fact evidently the reason of its introduction, this being one of the ways in which it is thought that a freeman should pass his leisure; as Homer says,

"But he who alone should be called to the pleasant feast, " and afterwards he speaks of others whom he describes as inviting

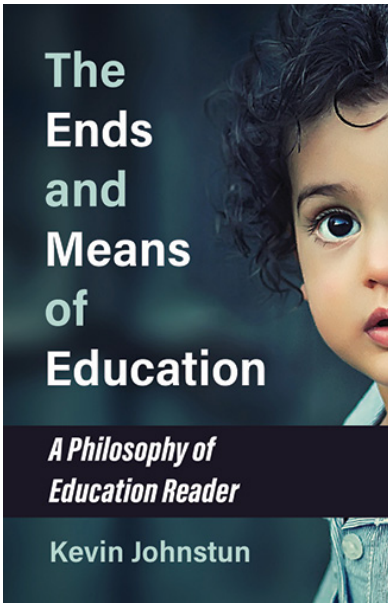
"The bard who would delight them all. " And in another place Odysseus says there is no better way of passing life than when men's hearts are merry and The banqueters in the hall, sitting in order, hear the voice of the minstrel.

It is evident, then, that there is a sort of education in which parents should train their sons, not as being useful or necessary, but because it is liberal or noble. Whether this is of one kind only, or of more than one, and if so, what they are, and how they are to be imparted, must hereafter be determined. Thus much we are now in a position to say, that the ancients witness to us; for their opinion may be gathered from the fact that music is one of the received and traditional branches of education. Further, it is clear that children should be instructed in some useful things- for example, in reading and writing- not only for their usefulness, but also because many other sorts of knowledge are acquired through them. With a like view they may be taught drawing, not to prevent their making mistakes in their own purchases, or in order that they may not be imposed upon in the buying or selling of articles, but perhaps rather because it makes them judges of the beauty of the human form. To be always seeking after the useful does not become free and exalted souls. Now it is clear that in education practice must be used before theory, and the body be trained before the mind; and therefore boys should be handed over to the trainer, who creates in them the proper habit of body, and to the wrestling-master, who teaches them their exercises.

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