



Ancient Philosophy

## Aristotle on Paideia of Principles

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**ABSTRACT:** Aristotle maintains that *paideia* enables one to judge the method used by a given speaker without judging the conclusions drawn as well (I.1 *De Partibus Animalium*). He contends that this "*paideia* of principles" requires three things: seeing that principles are not derived from one another; seeing that there is nothing before them within reason; and, seeing that they are the source of much knowledge. In order to grasp these principles, one must respectively learn to recognize what distinguishes the subject matters studied in different disciplines, see first principles as coming from experience and acquire the habit of seeking them in one's experience and, finally, see first principles as being the source of conclusions. While the second and third points might at first seem to pertain to "nous" and science, respectively, rather than to *paideia*, the case can be made that *paideia* involves more of a firm grasp of principles than "nous" and a less perfect way of relating conclusion to principles than science.

Aristotle speaks explicitly of *paideia* of method, the most noteworthy passage being Bk. 1, c. 1 of *The Parts of Animals*. He also explicitly identifies certain thinkers as lacking *paideia* this sort of *paideia*. *Paideia* of method allows a person to judge the way a speaker is proceeding without for so much being able to judge his conclusions (639a15).

What is less obvious is that Aristotle holds that there is *paideia* of principles. However, there is one passage which makes this fairly clear (*NE* 1098b5, cited below). In addition, careful examination of passages where Aristotle calls attention to judgments or misjudgments pertaining to *paideia* reveals that there is not one but many reasons for calling a method either good or bad, some of which reasons have to do with principles. This can be seen by contrasting the following two cases: Aristotle is critical of ethicists who insist on proceeding solely by demonstration because such rigor is inappropriate to ethical matters (*NE* 1094b20-28). However, the reason he criticizes Pythagoras for explaining moral virtue in terms of mathematical principles,<sup>(1)</sup> is that Pythagoras is starting from principles which are inadequate to explaining this matter. Of the two mistakes, that as to the starting point is plainly more serious. Every error as to starting point entails error as to one's subsequent proceeding, but not vice versa.

A principle is always a principle of something, and every method or orderly proceeding has a principle or starting point. This point provides a basis for maintaining that *paideia* of method and *paideia* of principles are distinct, though not radically separate kinds of *paideia*, and further that it is reasonable to infer that they are what Aristotle is referring to in the following passage:

And we must remember what has been said before ["It is the mark of an educated man to look for precision in each class of things just so far as the nature of the subject admits."

(*NE* 1094b24)], and not look for precision in all things alike....Nor must we demand the cause in all matters alike; it is enough in some cases that the fact be well established, as in the case of the first principles; the fact is the primary thing or first principle. Now of first principles we see some by induction, some by perception, some by a certain habituation, and others too in other ways. But each set of principles we must try to investigate in the natural way, and we must take pains to state them definitely, since they have a great influence on what follows. For the beginning is thought to be more than half of the whole, and many of the questions we ask are cleared up by it. (*NE* 1098b5)

Further examination of the Aristotelian corpus not only confirms that Aristotle holds that there is such a thing as *paideia* of principles, but also that he sees it as involving specifically three elements, the same three mentioned in his definition of first principle: "First principles must not be from each other, nor from anything else, and all things are from them." (*Phy.* 188a27)

### **"First principles must not be from each other"**

Recognizing that principles are not from one another depends on the correct determination of the subject matters of the sciences. If one is to start well and proceed well one must first have an idea of one's goal. Now the goal of intellectual endeavors is knowledge about some thing. Prerequisite then to recognizing the starting point of the road of a science is awareness of the existence of some object about which one can seek knowledge: "To inquire what a thing is, not knowing that it exists, is no inquiry at all." (*Post. An.* 93a27) Aristotle identifies the existence of the subject of a science, and also what this subject is as fundamental assumptions in every discipline:

Every demonstrative science is concerned with three things: the subjects which it posits (i.e. the genus whose essential attributes it studies), the so called axioms upon which the demonstration is ultimately based, and thirdly the attributes.... (*Post. An.* 76b13) Of subjects both the existence and the meaning are assumed.... (76b6)

He sees a proper understanding of what the subject of a science is as crucial to identifying the principles appropriate to solving a given problem:

It happens then in discussing the phenomena that people say things which do not agree with the phenomena. The cause of this is that they are not grasping the first principles (well), but want to bring everything back to predetermined opinions. For surely the principles of sensible things are sensible, of eternal things eternal, and of perishable, perishable, and in general a principle is of the same kind as the subject. (*Caelo* 306a)

Thus if someone should speak about the sum of the angles of a triangle, he would be speaking about a matter pertinent to geometry, but if he tried to prove what this sum was by use of a protractor, his principles would lack homogeneity with the matter, *as is evident to anyone who knows what the subject matter of geometry is*. The one who can distinguish

subject matters holds the key to seeing that first principles of different disciplines are not from one another.

### **"First principles are not from anything else"**

Knowledge that a first principle is not derived from anything prior to it consists principally in being conscious of what experience it is drawn from. For in this way one is sure that there is nothing prior to it within reason. According to Aristotle, our intellectual knowledge is the result of a natural process which starts from what is known through sense perception. (Cf. *Post. An.* 99b18, 99b36; *Meta.* 981a3, 4)

We can recognize that a principle is first when we see that it comes directly from experience. Sense experience, however, while being a foundation for all other kinds of experience, is not the only kind of experience we have. Different disciplines are based on different kinds of experience. For example, while the doing of geometry presupposes sense experience of lines, circles, etc., the lines and circles with which it deals are not perceived by sight, but by the imagination.<sup>(2)</sup> If someone is to know the first principles in a discipline he must be aware of what experience is appropriate in that discipline, as Aristotle insists: "Some principles are known by induction, others by sensation, others by habituation, and others too in other ways. But each set of principles we must try to investigate in the natural way..." (*NE* 1098b).

The person of *paideia* is the one who examines his experience to find these undeniable starting points, who takes care to found his knowledge on a solid basis. We find Aristotle praising Leucippus for so doing:

The best consideration, however, and the one of most general application, was delimited by Leucippus and Democritus: and, in maintaining it, they took as their starting-point what naturally comes first. ... [Certain other early philosophers] were led to transcend sense-perception, and to disregard it on the ground that 'one ought to follow the argument': and so they assert that the universe is 'one' and immovable.

... Leucippus, however, thought he had a theory which while agreeing with sense-perception, would not abolish either coming-to-be and passing-away, or motion, or the multiplicity of things. He spoke in accord with the facts of perception.... (*Gen.* 325a)

In addition to bringing his experience to bear on questions concerning generation, Leucippus also held on to his experience in the face of arguments indicating the contrary. He judged separately the argument and the fact, and did not get caught up in trying to refute some sophistical argument, when he had even surer evidence than argument for his conclusion. These are things which Aristotle associates with possessing *paideia*:

...in respect of each subject inability to distinguish arguments germane to the subject from those foreign to it is lack of education (*apaideusia*). And it is well to judge separately the statement of the cause and the demonstrated fact [because]...it is not proper in regard to all things to attend to theoretical arguments, but often rather to the facts of observation... (*EE* 1217a10, Loeb edition)

If one is ready to abandon what one is certain of, one seriously compromises one's intellectual progress..

An obstacle to recognizing that a principle has nothing before it is the conviction that every statement is in need of proof. As Aristotle notes:

Some indeed, demand to have the axiom proved, but this is because they lack education; not to know of what things one should demand demonstration, and of what one should not argue lack of education. For it is quite impossible that everything should have a proof;<sup>(3)</sup> the process would go on to infinity, so that there would be no proof. (*Met.* 1006a5)

An objection could be raised against the need for paideia of principles, namely, that first principles are *naturally* known to us. To answer this one must first distinguish the basic truths of demonstrative sciences: those proper to a specific science, and those common to several.<sup>(4)</sup> In the case of common principles, the experience necessary to see them falls immediately to everyone. The terms in question are being, whole and part, and the like. Thus, one cannot be ignorant of these principles due to lacking the experience necessary to understand the terms.<sup>(5)</sup>

The experience necessary to see proper principles is not always immediately within the reach of everyone. In different disciplines a different amount of experience is requisite for the proper principles to be grasped. For example, in mathematics the experience requisite is very little compared with natural science and a fortiori with metaphysics:

Indeed one might ask this question too, why a boy may become a mathematician, but not a philosopher or physicist. Is it because the objects of mathematics exist by abstraction, while the first principles of these other disciplines come from experience? (*NE* 1142a17)

Now each man judges well the things he knows, and of these he is a good judge. And so the man who has been educated (pepaideumenos) in a subject is a good judge of that subject, and the man who received an all-round education (pepaideumenos) is a good judge in general. Hence a young man is not a proper hearer of lectures on political science; for he is inexperienced in the actions that occur in life, but its discussions start from these and are about these.... (*NE* 1095a)

Note that it is particularly clear in the latter passage that the distinction Aristotle is making is similar to the one he makes in the *Parts of Animals* regarding paideia: There is someone other than the specialist who can listen with profit to a specialist's discourse. While this person in the *Parts of Animals* is said to judge in virtue of knowing the method proper to a discipline, here he is said to judge in virtue of possessing the proper experience.

Strictly speaking, however, it is not the experience alone which entitles one to be qualified as educated, but rather it is having arrived at a firm grasp of the principles of a discipline, such that one can judge whether a speaker errs or speaks well as to them. For sometimes people have sufficient experience and still fail to see in it a universal principle; whence they cannot judge what the speaker says, as can a person having paideia. Experience is a sine qua non for paideia, but does not in and of itself constitute paideia.

The natural faculty of *nous* insures a grasp of the truth of the first principles, including proper principles, as soon as the terms are known. The concern of paideia is the reflective and firm grasp of principles as something first. Paideia entails: recognizing that not every statement is in need of proof; looking to the relevant experience to bring to bear on questions, or seeking to acquire such experience; holding on to what one knows directly from experience; being alert to custom's power to mislead one regarding principles.<sup>(6)</sup>

## "All other things are from them"

A principle is a principle of something, and thus part of paideia of principles must involve some kind of knowledge of those things which come from first principles. It is one thing to recognize that something is true; it is another to see its power in explaining many things. To see that first principles are true is not difficult: "No one fails to hit the proverbial door", but it is generally hard to recognize a first principle as something which is capable of explaining many things in a given discipline.<sup>(7)</sup> Too often one recognizes that a principle applies in one case, but then fails to do so in other similar cases. Aristotle notes a number of such failures:

These thinkers...evidently grasped two of the causes...—vaguely—however, and with no clearness, but as untrained men behave in fight; for they go round their opponents and often strike fine blows, but they do not fight on scientific principles, and so too these thinkers do not seem to know what they say; for it is evident that, as a rule, they make no use of their causes except to a small extent. For Anaxagoras uses reason as a *deus ex machina* for the making of the world, and when he is at a loss to tell from what cause something necessarily is, then he drags reason in, but in all other cases ascribes events to anything rather than to reason. And Empedocles, though he uses the causes to a greater extent than this, neither does so sufficiently nor attains consistency in their use. (*Met.* 985a10)<sup>(8)</sup>

These thinkers do not see the principle in all its universality, but only in a contracted way. It is a universal human tendency to have difficulties in rising much above the level of sense, where our intellectual knowledge takes its origin, though some individuals experience less difficulty than others. The role that paideia of principles plays in overcoming this tendency takes the form of a habit one acquires of having continual recourse to principles, instead of only sporadically attempting to apply them.

A further problem with regard to first principles is our tendency to leave them unexploited due to their banality. Part of paideia, then, is to realize that much is contained in principles, despite their apparent superficiality,<sup>(9)</sup> and, again, to acquire the habit of having continual recourse to them.

To know that all other things are from first principles depends on using them; for in this way one sees them as source, as that from which other knowledge comes. To see that a principle is a principle of much knowledge seems then to imply possession of scientific knowledge. And indeed it belongs to the person who possesses scientific knowledge of conclusions to have the most perfect knowledge of principles as principles.<sup>(10)</sup> Paideia is less perfect than science: What is proper to the one possessing paideia is having the habit of trying to bring things back to principles, apart from whether one does so successfully. The acquisition of paideia of principles involves being exposed to some of the conclusions of a science as they are drawn from principles, such that even though one does not at first perfectly grasp the arguments, one does acquire some idea of the scope of the discipline's principles, and how they are to be applied.

## Conclusion

Paideia is not more than the first orientation in the direction of science. A person possessing paideia of principles understands the task he is undertaking, that is, he understands in a general way what the subject matter under investigation is. Further, he looks to his experience to find starting points, as vague<sup>(11)</sup> as they might be, and he also makes a continual effort to see all that is contained in this first knowledge. It is because it is indeed difficult to grasp principles as principles that one can not jump immediately into

science, but one needs the intermediary stage of paideia, which does not consist in mere familiarity with the conclusions of a discipline, but in a certain aptitude to relate things to first principles.

## NOTES

All translations are taken from *The Basic Works of Aristotle*, ed. Richard McKeon (New York: Random House, 1968) unless otherwise noted.

(1) *Magna Moralia* 1182a10.

(2) Cf. *Physics*, II.2.

(3) Cf. *Post. An.* I.3.

(4) *Post. An.* 76a38.

(5) Aristotle regards those who deny the common principles as feeble-minded: "To maintain that all things are at rest, and to seek an argument for this, disregarding sense, is due to a sick [or weak] intellect...." (*Caelo* 253a)

(6) Cf. *Met.* II.3.

(7) Cf. *Caelo* 271b10.

(8) Cf. also *Met.* 993a12 and *PA* 642a17.

(9) Cf. *Met.* 1029b: "...our task is to start from what is more knowable to oneself and make what is knowable by nature knowable to oneself. Now what is knowable and primary for particular sets of people is often knowable to a very small extent, and has little or nothing of reality. But yet one must start from that which is barely knowable but knowable to oneself, and try to know what is knowable without qualification."

(10) Cf. *Phy.* 194b15: "Knowledge is the object of our inquiry, and people do not think they know a thing till they have grasped the 'why' of it (which is to grasp its primary cause). So clearly we too must do this as regards ...every kind of physical change, in order that knowing their principles, we may try to refer to these principles each of our problems."

(11) Cf. *Phy.* 184a2.