

ARISTOTLE AND THE SOCIAL SCIENCES

BY

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In this age, when science basks in the warmest glow of public opinion it has enjoyed, its achievements have left the layman puzzled and confused about what it is that scientists do. The vast body of literature in the philosophy of science is an indication that the scientist himself often finds himself ^{sharing} ~~abhorring~~ the bewilderment of the public as to what it is he's supposed to be doing with himself. If even the physicist and the chemist--hard empiricists as they are considered--find themselves wary of their own footsteps, picture the confusion of the lowly social scientist, who divorced himself from his philosophical heritage only to find that he was not to be admitted to the ranks of science without serious reservations. Even his frequent recent pilgrimages back to mother philosophy can cause him consternation, with no less than Aristotle apparently suggesting the mantle of science may be worn with ease only by the geometer and mathematician, and perhaps less comfortably by the physicist. In the Nichomachean Ethics, for example, Aristotle suggests that not all subject matters admit of equal clarity, that ethics and political science may hope only to indicate truth "roughly and in outline", and that it is "foolish" to require scientific proof from the rhetorician.¹

¹Aristotle, 1094b 12-28

Does Aristotle really think such disciplines as sociology, economics, political science, etc. may not be called sciences? Perhaps the clearest way to find out is to examine Aristotle's idea of science and see if it applies to whatever social scientists characteristically do.

1) Aristotle's Definition of Science:

In the Posterior Analytics Aristotle says:

1. Scientific knowledge and its object differ from opinion and the object of opinion in that scientific knowledge is commensurately universal and proceeds by necessary connexions, and that which is necessary cannot be otherwise.²

Aristotle considers that these "essential attributes..." are

such as belong to their subjects as essential elements... (or) such that, while they belong to certain subjects, the subjects to which they belong are contained in the attribute's own defining formula.³

Later Aristotle equates "essential attributes" with the necessary premises of scientific demonstration:

Demonstrative knowledge must rest on necessary basic truths; for the object of scientific knowledge cannot be other than it is. Now attributes attaching essentially to their subject attach necessarily to them: for essential attributes are either elements in the essential nature of their subjects, or contain their subjects as elements in their own essential nature. (The pairs of opposites which the latter class includes are necessary because one member or the other necessarily inheres.) It follows from this that premisses of the demonstrative syllogism must be connexions essential in the sense explained: for all attributes must inhere essentially or else be accidental, and accidental attributes are not necessary to their subjects.⁴

²Aristotle, 88b 30-34

³Aristotle, 73a, 34-35

⁴Aristotle, 74b 5-10

Thus, science is the demonstration that certain things are as they are because the nature of the thing is such that they cannot be otherwise. The three interior angles of a triangle, for example, equal 180° because, due to the nature of the triangle, they must be. Or, a billiard ball moves when struck by another because there is motion in the latter, and the nature of this motion is such that it is transmitted to the former by contact: motion, by its nature, is a cause of motion. When one demonstrates the necessary connections between these things (e.g., the necessity of a three sided plane figure having three interior angles equal to 180° , or the necessity of motion causing motion) he is doing science.

The object of Aristotle's science—that which science is about—is cause. In the Posterior Analytics, Aristotle argues that:

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.⁵

It seems here, however, that Aristotle arbitrarily restricts the use of the term "science" to the deductive reasoning from the universal law to the particular instance, and not to the discovery of the universal law itself. (from Posterior Analytics) "Such, then, is our doctrine, and in addition we maintain that besides scientific knowledge there is its originative source which enables us to recognize the definitions."⁶

⁵Aristotle, 71b 8-12

⁶Aristotle, 72b 23-25

He is, of course, entitled to do this if he chooses, but contemporary scientists are more inclusive in their usage, using science to refer also to the discovery of the universal. (or the general, if one wishes to believe that scientists are actually content to rest with probabilities) Since this is so, it is necessary to investigate Aristotle's conception of how universals are obtained; his "originative source."

The first and most obvious suggestion for the originative source of scientific universals would seem, of course, to be induction. Aristotle, however, does not seem originally to want to accept this. He says "...we may not proceed as by induction to establish a universal on the evidence of groups of particulars which offer no exception, because induction proves not what the essential nature of a thing is but that it has or has not some attribute."⁷ Later on, however, he seems to reverse his position diametrically: "Thus it is clear that we must get to know the primary premisses by induction; for the method by which even sense-impression implants the universal is inductive."⁸

It seems likely, however, (especially considering Aristotle, Posterior Analytics, 100a 4-8)⁹ that Aristotle in the first instance means to refer

⁷Aristotle, 92a 37-40

⁸Aristotle, 100b 3-4

⁹ "So out of sense-perception comes to be what we call memory and out of frequently repeated memories of the same thing develops experience; for a number of memories constitute a single experience. From experience again--i.e. from the universal now stabilized in its entirety within the soul, the one beside the many which is a single identity within them all--originate the skill of the craftsman and the knowledge of the man of science, skill in the sphere of coming to be and science in the sphere of being."

only to imperfect induction (knowledge of the fact) and in the second to perfect induction (knowledge of the reasoned fact). As he suggests earlier:

...there are cases when an act of vision would terminate our inquiry, not because in seeing we should be knowing, but because we should have elicited the universal from seeing; if, for example, we saw the pores in the glass and the light passing through, the reason of the kindling would be clear to us because we should at the same time see it in each instance and intuit that it must be so in all instances.¹⁰

It would seem, therefore, that Aristotle considers science to be the deductive demonstration of causes, using universal truths about the nature of things apprehended by perfect induction (or intuition). Even excluding the inductive process from science (as Aristotle does) it does not seem that the social sciences are excluded from this definition by their nature. Even if we grant the vastness and complexity of the subject matter, there seems no reason why perfect inductions about the nature of social phenomena cannot be made, nor why deductive demonstrations may not be based on these premisses.

One possible objection which has been raised ¹¹ to performing Aristotelean science on social phenomena rests on the premise that social phenomena are too variable for universal laws to be discovered in them. The argument in brief is that 1) the cause of social phenomena is ultimately human agency, and 2) human agents have free will, and hence are indeterminate or variable, and thus perfect knowledge through causes is not possible since a changeable cause can not be known perfectly. This argument, however, does not seem cogent.

¹⁰Aristotle, 88a 13-17

¹¹Thomas M. Govern, Proceedings of the American Catholic Philosophical Association, Vol. 36, page 59.

The causes Aristotle seeks are essential causes (i.e., they follow from the nature of the phenomenon--including the four types of cause--i.e., motion by its nature causes motion, etc.). In Aristotelean terms it is not possible to speak of a substance having a "variable nature"; man may be free, but he is always man. Thus while what a man does may vary with circumstances, what he is is always man. It follows from the (Aristotelean) nature of man, for example, that he can gain information from only two sources, for example--observation and testimony. It also follows that action is contingent on knowledge. Thus it seems possible to determine 1) general laws of how information may be assimilated, and 2) how man, having received this information, will act as a consequence. As Aquinas points out:

"Hence it is that, according to the definitions of Aristotle, Gregory of Nyssa and Damascene, the voluntary is defined not only as having a principle within the agent, but also as implying knowledge. Therefore, since man especially knows the end of his work, and moves himself, in his acts especially is voluntary to be found."

and again:

"In like manner, neither is natural necessity repugnant to the will. Indeed, just as the intellect of necessity adheres to first principles so the will must of necessity adhere to the last end, which is happiness...But natural necessity does not take away the liberty of the will..."

What I am arguing here is that, while what man does may vary, why he does it does not.

With the foregoing in mind, it would seem that the social sciences can fulfill Aristotle's criteria for science.

Georg Simmel, for example, ~~for example~~, has written in Sociology about the numerical relations inherent in groups. He points out that there are certain characteristic qualities which inhere in groups of certain sizes: the three-person group (triad), for example, presents the possibility of a coalition of two members viz a viz the third; a situation not possible in the two person group (dyad). Clearly this is argument from the nature of the thing, and since the reason this is so is intuitively obvious, the induction is a perfect one. Would Aristotle deny this demonstration the appellation "scientific"?

Aristotle may have been wrong in many instances, and at times his work may be considered to substitute one problem for another, but logical inconsistency is not his weakness. Certainly the above demonstration meets Aristotle's criteria for science, and must therefore be admitted as scientific. How then can Aristotle maintain his distinction between the speculative sciences (such as Geometry and Arithmetic) and practical sciences (sociology et. al.) which are only sciences metaphorically to him?

It seems that the answer is one of definition. In the Posterior Analytics Aristotle says:

...it is the physician's business to know that circular wounds heal more slowly, the geometer's to know the reason why. ¹²

¹²Aristotle, 79a 14-16

This may be a partial key to the problem. In the instance cited, the the physician's knowledge that a circular wound heals more quickly is not scientific. There is no reason, however, why he could not also find out why this is so, and thus fulfill the Aristotelian criteria for science. When he does, however, he no longer does medicine, as Aristotle defines it, but geometry. Similarly, when Simmel discovers the essential characteristics of various numerically constituted groups, he is no longer doing Sociology, but Arithmetic. Thus the reason Aristotle can feel the way he does about the "lesser" sciences seems simply to be a matter of arbitrary word usage.

We can think of Aristotle as somewhat of a "reductionist." He seems to feel that the essential relationships among things can be reduced to the lowest level (i.e., most basic, or most highly abstract) of principles, and that these, for the most part, are mathematical and geometric relationships.

The example of the circular wound is very clearly geometric, and Simmel's work is equally clearly tied to arithmetic. The change might validly be brought that choosing these for example is too obviously stacking the cards in favor of our thesis. In most instances the connections are not so easily seen. One current theory drawn from current sociological research will suffice as an example.

George Herbert Mead and those members of the school of thought called symbolic interactionism generally argue that man acts always in accordance with his conception of himself. This simply means that man cannot act with regard to an object (human or non-human) unless he knows how he is related to that object--whether he loves it, fears it, chooses it, rejects it, etc. The conditions necessary for this knowledge are 1.) a knowledge of what the object is, and 2.) a knowledge of what he is. This, Mead would argue, is the nature of man; it is necessary and cannot be otherwise for action to proceed from these sources. The reduction of these laws to non-sociological "primary premises" is not

obvious but can be seen. First, the notion that there must be some ^{cause} course of human action at all follows from the mathematical axiom nothing can come from nothing. That the ^{cause} course of action must be knowledge of the self and object follows from the axiom the cause must be like its effect (which really follows from the first axiom.) So even in this case, when we move from the fact (man acts according to his self conception Because...) we depart from sociology and enter the realm of the basic axioms or primary premises which Aristotle says all sciences share.

Further examining this theory we note that the sources of the self-conception may be (in general) two: either self-discovery (by seeing oneself how one is related to objects) or by the testimony of others. Again this is clearly (1) a sociological fact, which may be observed, and 2) an axiomatic reasoned fact. It also may be observed that a person may assimilate self conceptions from others by observing that they (a) are related to objects in the same way as they themselves, and (b) have self-conceptions about these objects. From the geometrical axiom two things equal to the same thing are equal to each other, it follows that the self conception of the one may be taken over by the other in regard to that object. Again, there is an example of how it is the sociologists task to know that such identifications take place, and the geometers (for Aristotle) to know why.

It would seem there that the problem of the social sciences is merely one of definition. All the basic axioms (or at least most) are defined outside the realm of those sciences, and although the social scientist makes use of them in explanations, when he does so, Aristotle claims they cease doing social science.

Some notes.

should say here - through proper cause.

- p. 1. For A. science is an analogous word. The definition he works out in the beginning of the Post. Anal. - certain knowledge through cause - is the first meaning, science in its perfection. It is not the only meaning. Since it is only in math that certain knowledge through cause is consistently attained, only this qualifies as science in this first meaning. The natural scientist may often gain certain knowledge, but rarely through cause. Hence, for A. natural science is ~~far~~ less perfectly science.

He is anxious to set up an ideal (first meaning) of science.

For A. ethics and political science are of necessity practical sciences. No properly ethical conclusion has been reached until the question has been answered - what to do here and now in order that the action be good. Since circumstances of persons, place, times, customs, can all influence the answer to this questions, no ethical conclusions are necessary and immutable. I have an article I did ~~XXX~~ on this.

- p. 2. In so far as an analogous word has several meanings, it signifies several different ideas. Hence, Aristotle has several different ideas of science, not just one. The first meaning is that mentioned above. According to different, broader, meanings, ethics, political science, and other such practical disciplines, can be called science, and he often does speak of them as science.

I think it would be better to take the definition of science from ch. 2 of the Postl. Anal. (i.e., the one you give on your p. 3.) 12-14. It is there that A. justifies his definition, although briefly.

The reason for A's restriction of science (in its first meaning) to knowledge gained demonstratively is that, although induction can perhaps often produce certain knowledge, it can't produce certain knowledge through cause. In fact, if we know the cause, we can demonstrate through that cause, and don't need (enumerative) induction.

The universal propositions of which demonstration is constituted have to be known through some kind of induction (abstractive), as A himself indicates when he says they are first, immediate, and indemonstrable. The reason for necessity, or immutability on the part of the object known lies in the certain and habitual character of science. In the measure that the object can change and become other than it is, what one holds to be true today can become false tomorrow, not on account of any defect in the manner of knowing, but because of the changeability on the part of the object.

- p. 4. Induction has two meanings. There is enumerative (this hunk of copper is a conductor, this hunk of copper is a conductor, etc. therefore all copper is a conductor) and abstractive. It is by the latter that the first, immediate, and indemonstrable principles of demonstration are obtained. These are self-evident props in which the predicate is the definition, or part of the definition, of the subject. (All triangles are three sided), The process by which these are arrived at is a process of defining, but it is abstractive in so far as all our definitions have to be formed from some observation of singulars. Thus, in defining, there is a process of going from the singular to the universal, which is the common meaning of induction. In the example ~~XX~~ mentioned, we could never form a definition of a triangle if we did not have some experience of extended things, but once the proposition is formed, its truth is seen independently of any singulars; i.e., the motive for the assent to the truth of the proposition rests on the necessity seen in this, that to deny the predicate is to deny the subject, no on any enumeration of singulars.
- p. 5. Whatever strictures would be placed on the social sciences, as ~~XXXXXXXX~~ sciences, would follow from the nature of science as certain and habitual. In the measure that social sciences investigate contingent, changing, social conditions (i.e., 19th century social conditions, present social conditions in American cities), which I certainly hope they do, or else they can never bring about any betterment of, or amelioration of, those conditions, the subject is too changeable to permit of habitual, certain knowledge. A. would say that so long as one remains on the plane of what is natural to man along social lines, certain habitual knowledge would be possible, but then one is actually in natural science.

Science, according to A. is not so much deductive demonstration of causes, but demonstration of truths through their causes. E.g., if we knew (which we don't) the proper cause why cigarette smoking produces lung cancer, we could formulate the reasoning as follows: Whatever contains x (the unknown proper cause) produces lung cancer; cigarette tobacco, or paper, or something contains x, therefore cigarette smoking produces lung cancer. If this proper cause were known, we could then dispense with the induction on the strength of which the proposition is actually held to be true, since it would have been proved through its cause. Actually, this matter could never be the subject of science, in the first meaning of the word, since the whole business is too contingent. Cigarettes have been in existence for less than a hundred years, and no one knows how long they will be in existence.

Human reason is the cause (determined and accidental) of particular, actual, social situations. It is these that keep constantly varying.

p. 6. What man does does vary. Why he does it does not vary so long as you stick to the most universal motive. He always acts for happiness. But when you come down to even a ~~le~~^{slightly} less universal plane, the why also varies. I.e, some find happiness in a life of knowledge, others in a life of sensible pleasure, others in the accumulation of wealth, ~~XX~~ others in the service of others. Different man do act for different motives in so far as happiness for one is not happiness for another.

p. 7. Simmel's proposition is necessarily and absolutely true. It is true from the difference in number between a two-person group and a three person group. But it seems to me that if the social sciences were to stick to propositions of this nature, they could never do any good. They have to get much more particular than that if they are ever going to make any contributions to the betterment of any social situation in ~~any~~ area at any time. But, as soon as you descend to particulars - e.g., what are the possibilities of a coalition of these persons, or these groups vis a vis this third, you are in a situation that can change at any time in the future.

Moreover, I do not think there is any demonstration here. It is self-evident that a three-person group presents possibilities that a two-person group does not present.

It seems to be ~~is~~ something like ethics. If you say that unjust killing is wrong, this is universally certain because self-evident. The word unjust makes such killing wrong. But you are not saying much. The moralist is not making much of a contribution until he starts to work out just what killing is unjust and what isn't. Right away he begins to get into uncertain and variable matter. When it comes down to singulars, the question whether this killing is just or unjust can be still more uncertain.

p. 8. The point here, I think, is that the physician does not have to know why circular wounds heal more slowly (if this is true at all); all he has to know is what is necessary in order to treat them successfully. A's point seems to be that the ultimate reason for this lies in the nature of circle, as such, as distinguished, say, from a narrow ellipse, as such, since the edges of the latter are closer together, as any geometrician knows. Hence, the geometrician, in knowing what a circle is, would know ~~why~~ the ultimate reason why circular wounds heal more slowly. This is all fouled up, (by me) but the point is: if the reason why circular wounds heal more slowly lies precisely in their circularity, then the geometrician, in knowing what a circle is, would understand the why of this phenomenon. Similarly, the psychologist, in knowing that all men act for happiness, knows the ~~why~~ (ultimate) of all human endeavor. But, just as the geometrician's knowledge will not help him heal wounds, so also, the psychologist's will not help him bring any remedies to existing social evils. It is too general and abstract.

- p. 8. It seems Mead leaves something out. "Whether he loves it, rejects it, fears it, or chooses it." ^{Loving,} ^{rather than} ^{rejecting,} ^{itself requires} ^{an explanation.} It seems he will not love or choose it, unless he sees it as related to himself as somehow suitable, or convenient, or, in one word, good. He will not fear it, or reject it unless he sees it as related to himself as in some way unsuitable, or inconveniens, in one word, bad. Action certainly involves some knowledge of the object, and some knowledge of self, too. But the only relation of the object to self which will bring about action is the relation of goodness, or evil, seen. In other words, the object may be related to the self in any number of ways - e.g., as bigger than, heavier than, far away from, different from, like to, etc., but no one of these relations will bring about any action in regard to that object, unless they somehow enter into its goodness. (E.g., fact that Stuart is bigger than I might make him bad, so far as fighting him is concerned).

To get back to the physician and the geometirican. It seems to me that it is the biologist who knows the why (so far as it is knowable// at all) of most of what the physician does. If we are looking for a discipline that stands in the same relation to the social sciences, it seems to me it would be ~~physiology~~ psychology, which is part of natural science.

- p. 9. One of definition - of science? or of social science? ~r both. I have trouble understanding this page.