

Topics and Posterior Analytics

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Logic

- Aristotle is the first philosopher to study systematically what we call “logic”
- Specifically, Aristotle investigated what we now call “deductive” logic
 - “A deduction, then, is an argument in which, if p and q are assumed, then something else r , different from p and q , follows necessarily from p and q ” (*Topics*, Book I, Chapter 1)
- The assumptions p and q are premises
- What follows, r , is the conclusion

Deduction and Fallacy

- In a genuine deduction, the conclusion follows of necessity from the premises
- In an apparent or fallacious deduction, the conclusion does not follow from the premises
- Aristotle separated genuine from fallacious deduction by examining the form of the deduction
- Arguments with a given form are genuine or fallacious, regardless of their content

Demonstration and Dialectic

- Deductions are of two types
- In a *demonstration*, the premises are “true and primary”
 - True and primary premises produce conviction through themselves
 - Each is credible in its own right
- In *dialectical deduction*, the premises are “common beliefs”

Common Beliefs

- The common beliefs making up the premises of a dialectical deduction are either:
 - Believed by everyone, or
 - Believed by most people, or
 - Believed by the wise
 - All the wise, or
 - Most of the wise, or
 - The most known and commonly recognized of the wise

Contentious Deduction

- A truly dialectical deduction proceeds from what really are common beliefs
- A contentious dialectical deduction is either:
 - A genuine deduction proceeding from apparent common beliefs that are not really common beliefs, or
 - A fallacious deduction that apparently proceeds from common beliefs
 - Real common beliefs, or
 - Apparent common beliefs

Fallacious Scientific Deductions

- A type of deduction that is neither demonstrative nor dialectical uses premises proper to geometry and related sciences
- These premises are wrong diagrams
 - Producing semi-circles wrongly
 - Drawing lines wrongly
- They are not common beliefs
- It appears that if the diagrams were correct, the deductions would be demonstrations

Uses of Dialectical Demonstration

- Knowing the forms of dialectical demonstration is useful in several ways
 - For training
 - We can easily take on a line of argument proposed to us (for the sake of argument)
 - For encounters with others
 - We can take as premises the beliefs of the others and approach the subject from their point of view
 - For philosophical sciences
 - Seeing things from both sides helps us find the truth
 - It helps us find the primary things in each science

Definition

- What is definitory is a line of inquiry concerning sameness and difference
 - Is knowledge the same as perception? (Plato)
- “A definition is an account that signifies the essence” (*Topics*, Book I, Chapter 5)
 - The account can replace the name
 - Man is a rational animal
 - The account can replace the account
 - Man is rational locomotive living thing
- Replacement of a name for a name is not definition, but only definitory

Definition and Dialectics

- We often argue dialectically that x is the same as y or that x is different from y
- Such arguments put us into a good position to determine definitions
 - If we have shown that two things are not the same, we can undermine a purported definition
 - However, showing that two things are the same does not establish a definition, since it does not provide an account of the essence

Distinctive Properties

- Some accounts of things reveal a distinctive property
 - Only human beings are capable of grammatical knowledge
 - Only beings capable of grammatical knowledge are human
- The property “capable of grammatical knowledge” is not of the essence of man, so giving that distinctive property does not define man
- Properties that are possessed only at times (being asleep) are not distinctive

Genus

- “A genus is what is essentially predicated of a plurality of things differing in species” (*Topics*, Book I, Chapter 5)
 - Animal is essentially predicated of men, chickens, elephants, worms, etc.
- Dialectical argument can be applied to questions of the genus
 - To establish that two things (man and ox) are in the same genus
 - To establish that two things (man and oak tree) are in different genera

Coincidents

- A coincident (“accident”) belongs to a subject
- It is neither:
 - Definition (essence)
 - Distinctive property
 - Genus
- For a given subject S, a coincident admits of:
 - Belonging to S
 - Socrates is seated
 - Not belonging to S
 - Socrates is standing

Coincidents and Distinctives

- Some questions concern the relations among the coincidents
 - Is the life of virtue or the life of gratification more pleasurable?
- These questions ask which of the two is more coincident than the other
- A coincident can be a distinctive relative to a thing and a time
 - I am the only person seated now

Intellectual States

- A number of intellectual states are capable of grasping the truth
- Some grasp the truth invariably
 - Knowledge
 - Understanding
- Others admit of being false
 - Belief
 - Reasoning

Learning

- All teaching and learning begins with what has already been learned, as is seen from crafts and the mathematical sciences
- When we truly come to know, we may only use as premises in our deductions what has already been learned (otherwise, they are dialectical)
- Two kinds of things can be learned
 - That the thing spoken of is
 - What kind of thing the thing spoken of is

Learning by Induction

- We learn by induction when we are able to generalize our knowledge of a particular
 - A figure x inscribed in a semi-circle is a triangle
 - I demonstrate that x has property F
 - I generalize that all triangles of this sort have property F
- My knowledge that x is F is simultaneous with my knowledge that everything like x is also F

The *Meno* Puzzle

- Suppose I am said to know by induction that for all x of kind K , x is F
 - All pairs are even
- Suppose I do not know that y and z are of kind K
 - There is a pair y, z that I do not know exists
- According to the puzzle in the *Meno*, since I know that all pairs are even, I cannot inquire into whether x and y are even, so I cannot know that they are even: a contradiction

A Bad Solution

- It had been suggested that one solves the puzzle by limiting the initial knowledge claim
 - All pairs are even
- Instead, it should be
 - All pairs of which I know are even
- But this “solution” means that we cannot learn through induction, which is false

A Good Solution

- We do not know in every way what we are learning
 - I know in a general sense that every pair is even
 - But I do not know what are all the pairs to which this general claim applies
- Thus, I can learn something about that which, in a qualified way, I already know
- Plato's paradox arises only if we do not qualify our knowledge claims appropriately

How We Think We Know

- We think we know something without qualification if we think we know
 - The explanation because of which the thing is
 - That the explanation is an explanation of that thing
 - That the thing is not capable of being otherwise
- These three conditions are sufficient for knowledge, though they may not be necessary

Demonstrative Knowledge

- Knowledge through demonstrative deduction satisfies the sufficient conditions of knowledge
- Because it satisfies these conditions, demonstrative knowledge is a conclusion from premises that explain the thing
- Because the knowledge is from demonstration, the premises must satisfy the conditions for demonstration

Premises

- A premise is an affirmation or denial of one of a pair of contradictory opposites
- A principle (or “primary thing”) is an immediate premise which has no premises prior to it
- Premises can be distinguished in terms of the type of demonstration they produce
 - Dialectical, if affirming or denying are indifferent
 - Demonstrative, if something is affirmed or denied because it is true

Premises of Demonstrative Knowledge

- The premises for demonstrative knowledge must have the following features:
 - They are true (so the conclusion must be true)
 - They are primary and immediate (and not demonstrated or mediate)
 - They are better known than the conclusion
 - We comprehend them
 - We know that they are true
 - They are explanatory of the conclusion

Skepticism

- If all knowledge is demonstrative, then there is no knowledge at all
 - The principles of the demonstration must themselves be known
 - Therefore, they are demonstrated from other principles
 - These principles must be demonstrated, leading to an infinite regress or circular reasoning
 - But an infinite regress of definitions is impossible
 - Circular reasoning violates the priority of premises over the conclusion

Understanding

- Aristotle wishes to avoid skepticism without denying that all knowledge is demonstrable
- To do so, he denies that the principles of demonstration must be known
- The principles are more exact than their conclusion, and understanding is more exact than knowledge
- We have understanding, not knowledge, of the principles of demonstration

Prior and Better Known

- There are two senses in which x can be prior and better known than y
 - By nature: x is universal and y is particular
 - The universal x is farther from perception than y
 - By us: x is particular and y is universal
 - The particular x is closer to perception than y
- Only what is prior by nature can serve as principles of demonstration
- But what is prior to us leads us to principles, in a way to be explained later

Conviction

- If we are to know through demonstration, we must have more conviction about the premises than about the conclusion
 - What makes something F is more F than what is made F
- There must also be nothing which is opposed to the premises that is better-known than the premises themselves
 - Someone knowing without qualification cannot be persuaded out of knowing

The Reason for the Fact

- The premises in demonstrative knowledge provide a reason for the fact that is its conclusion
- The fact must first be established before a reason for it can be given
- Sometimes we establish the fact without giving the reason for the fact
 - If we establish that a shadow cannot be cast by the moon, we establish that there is an eclipse

The Account

- The account describes what the thing is
- It can also at the same time establish that the thing is
 - If we establish that what lights the moon is blocked by the earth, we establish that there is an eclipse
- The account is a definition of what the thing is (the “what-it-is” of the thing)
 - The definition of an eclipse is the blockage of light by a heavenly body

Knowledge of Principles

- The primary premises of demonstration are either known innately or are acquired
- They are not known innately
 - If they were, we would have exact knowledge which we did not notice for a long time
- They are not acquired from no prior knowledge at all
 - If they were, then we would not be able to learn
- They are therefore acquired after being known potentially

Perception and Experience

- All animals have knowledge potentially insofar as they have perception
 - They can have knowledge by perception of what is present to them
- Some animals can extend their knowledge through memory
- A number of memories makes up experience
- So, perception is the basis of all knowledge

Grasping the Universal

- Rational accounts, applying universals to particulars, arise through experience
- Perception is always of a particular which has a universal character
 - I perceive man when I perceive Socrates
- When many such universals have settled in the soul, one grasps rationally that the universal applies to the particular
- This process is called “induction”