Topics and Posterior Analytics

Philosophy 21
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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 genuses
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”