

### Aristotle's "Connecting Term" model of explanation

- a. A fact is explained by a given science if it is deducible from the first principles of that science.
- b. First principles are necessary truths.
- c. Hence what is explained (an *explanandum*) must also be a necessary truth.
- d. An *explanandum* has a subject-predicate form: *A* belongs to *C*.
- e. An explanation is a way of **connecting** *A* to *C* by means of a middle term that belongs necessarily to *C*.
- f. Thus, we can explain why *necessarily, every C is A* by finding a middle term, *B*, such that:

$$\Box AaB \ \& \ \Box BaC$$

Example: Why are whales (*C*) necessarily warm-blooded (*A*)? Because (*explanans*): necessarily, mammals (*B*) are warm-blooded, and necessarily, whales are mammals.

- g. The propositions in the *explanans*,  $\Box AaB$  and  $\Box BaC$ , must either be first principles or deducible from first principles.

### Some Passages in *Posterior Analytics* (those marked by \* are not in *Selections*)

- I.6, 74b5: "We have found that demonstrative knowledge<sub>e</sub> is derived from necessary principles (since what is known cannot be otherwise) and that what belongs to things in their own right is necessary ...."
- I.4, 73a23: "Since what is known<sub>e</sub> without qualification cannot be otherwise, what is known by demonstrative knowledge will be necessary."
- I.22, 84a36-37: "... we demonstrate by inserting a term <between two terms>, not by adding another <from outside>...."
- I.6, 75a5: "... whenever the middle is necessary, the conclusion will also be necessary, just as truths always result in truth. (For let *A* be said of *B* necessarily, and *B* of *C* <necessarily>; it is also necessary, then, for *A* to belong to *C* <necessarily>.)"
- I.6, 75a13: "Since, then, what we know<sub>e</sub> demonstratively must belong necessarily, it is clear that we must also demonstrate through a middle that is necessary. Otherwise we will not know<sub>e</sub> either the reason why or that it is necessary for this to be."
- \*I.13, 78<sup>a</sup>22: "Understanding the fact and the reason why differ."
- \*I.24, 85<sup>b</sup>22: "A demonstration is a deduction that reveals (lit., 'proves', *deiktikos*) the explanation."
- \*II.3, 90<sup>a</sup>35: "It is clear that all questions are a search for a middle."