Material and Formal Fallacies

from Aristotle's
On Sophistical Refutations

Part 1

Let us now discuss sophistic refutations, i.e. what appear to be refutations but are really fallacies instead. We will begin in the natural order with the first.

That some reasonings are genuine, while others seem to be so but are not, is evident. This happens with arguments, as also elsewhere, through a certain likeness between the genuine and the sham. For physically some people are in a vigorous condition, while others merely seem to be so by blowing and rigging themselves out as the tribesmen do their victims for sacrifice; and some people are beautiful thanks to their beauty, while others seem to be so, by dint of embellishing themselves. So it is, too, with inanimate things; for of these, too, some are really silver and others gold, while others are not and merely seem to be such to our sense; e.g. things made of litharge and tin seem to be of silver, while those made of yellow metal look golden. In the same way both reasoning and refutation are sometimes genuine, sometimes not, though inexperience may make them appear so: for inexperienced people obtain only, as it were, a distant view of these things. For reasoning rests on certain statements such that they involve necessarily the assertion of something other than what has been stated, through what has been stated: refutation is reasoning involving the contradictory of the given conclusion. Now some of them do not really achieve this, though they seem to do so for a number of reasons; and of these the most prolific and usual domain is the argument that turns upon names only. It is impossible in a discussion to bring in the actual things discussed: we use their names as symbols instead of them; and therefore we suppose that what follows in the names, follows in the things as well, just as people who calculate suppose in regard to their counters. But the two cases (names and things) are not alike. For names are finite and so is the sum-total of formulae, while things are infinite in number. Inevitably, then, the same formulae, and a single name, have a number of meanings. Accordingly just as, in counting, those who are not clever in manipulating their counters are taken in by the experts, in the same way in arguments too those who are not well acquainted with the force of names misreason both in their own discussions and when they listen to others. For this reason, then, and for others to be mentioned later, there exists both reasoning and refutation that is apparent but not real. Now for some people it is better worth while to seem to be wise, than to be wise without seeming to be (for the art of the sophist is the semblance of wisdom without the reality, and the sophist is one who makes money from an apparent but unreal wisdom); for them, then, it is clearly essential also to seem to accomplish the task of a wise man rather than to accomplish it without seeming to do so. To reduce it to a single point of contrast it is the business of one who knows a thing, himself to avoid fallacies in the subjects which he knows and to be able to show up the man who makes them; and of these accomplishments the one depends on the faculty to render an answer, and the other upon the securing of one. Those, then, who would be sophists are bound to study the class of arguments aforesaid: for it is worth their while: for a faculty of this kind will make a man seem to be wise, and this is the purpose they happen to have in view.

Clearly, then, there exists a class of arguments of this kind, and it is at this kind of ability that those aim whom we call sophists. Let us now go on to discuss how many kinds there are of

sophistical arguments, and how many in number are the elements of which this faculty is composed, and how many branches there happen to be of this inquiry, and the other factors that contribute to this art.

Part 4

Refutations, then, that depend upon language are drawn from these common-place rules. Of fallacies, on the other hand, that are independent of language there are seven kinds:

(1) that which depends upon Accident:
(2) the use of an expression absolutely or not absolutely but with some qualification of respect or place, or time, or relation:

(3) that which depends upon ignorance of what 'refutation' is:
(4) that which depends upon the consequent:
(5) that which depends upon assuming the original conclusion:
(6) stating as cause what is not the cause:
(7) the making of more than one question into one.

Aristotle's Formal and Material fallacies explained

The material fallacies are also known as fallacies of presumption, because the premises "presume" too much--they either covertly assume the conclusion or avoid the issue in view.

The classification that is still widely used is that of Aristotle's *Organon* – Sophistici elenchi / *Sophistic Refutations*:

(1) The fallacy of accident is committed by an argument that applies a general rule to a particular case in which some special circumstance ("accident") makes the rule inapplicable. The truth that "men are capable of seeing" is no basis for the conclusion that "blind men are capable of seeing." This is a special case of the fallacy of secundum quid (more fully: *a dicto simpliciter ad dictum secundum quid*, which means "from a saying [taken too] simply to a saying according to what [it really is]"--i.e., according to its truth as holding only under special provisos). This fallacy is committed when a general proposition is used as the premise for an argument without attention to the (tacit) restrictions and qualifications that govern it and invalidate its application in the manner at issue.

Example: Stealing is a crime. Stealing is a part of baseball. Therefore baseball is a criminal activity.

(2) The converse fallacy of accident argues improperly from a special case to a general rule. Thus, the fact that a certain drug is beneficial to some sick persons does not imply that it is beneficial to all people. *a dicto secundum quid ad dictum simpliciter*.

Example: Every leaf I have seen is green, therefore all leaves are green.

(3) The fallacy of irrelevant conclusion (*Ignoratio Elenchi* or ignorance of refutation) is committed when the conclusion changes the point that is at issue in the premises. Also called a 'red herring.' Special cases of irrelevant conclusion are presented by the so-called fallacies of relevance. These include

> (a) the argument *ad hominem* (speaking "against the man" rather than to the issue), in which the premises may only make a personal attack on a person who holds some thesis, instead of offering grounds showing why what he says is false,
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> (b) the argument *ad populum* (an appeal "to the people"), which, instead of offering logical reasons, appeals to such popular attitudes as the dislike of injustice,
>
> (c) the argument *ad misericordiam* (an appeal "to pity"), as when a trial lawyer, rather than arguing for his client's innocence, tries to move the jury to sympathy for him,
>
> (d) the argument *ad verecundiam* (an appeal "to awe"), which seeks to secure acceptance of the conclusion on the grounds of its endorsement by persons whose views are held in general respect,
>
> (e) the argument *ad ignorantiam* (an appeal "to ignorance"), which argues that something (e.g., extrasensory perception) is so since no one has shown that it is not so, and
>
> (f) the argument *ad baculum* (an appeal "to force"), which rests on a threatened or implied use of force to induce acceptance of its conclusion.

(4) The fallacy of circular argument, known as *petitio principii* ("begging the question"), occurs when the premises presume, openly or covertly, the very conclusion that is to be demonstrated (example: "Gregory always votes wisely." "But how do you know?" "Because he always votes the way I do."). A special form of this fallacy, called a vicious circle, or *circulus in probando* ("arguing in a circle"), occurs in a course of reasoning typified by the complex argument in which a premise p1 is used to prove p2; p2 is used to prove p3; and so on, until pn - 1 is used to prove pn; then pn is subsequently used in a proof of p1, and the whole series p1, p2, . . . , pn is taken as established (example: "McKinley College's baseball team is the best in the association [pn = p3]; they are the best because of their strong batting potential [p2]; they have this potential because of the ability of Jones, Crawford, and Randolph at the bat [p1]." "But how do you know that Jones, Crawford, and Randolph are such good batters?" "Well, after all, these men are the backbone of the best team in the association [p3 again]."). Strictly speaking, *petitio principii* is not a fallacy of reasoning but an ineptitude in argumentation: thus the argument from p as a premise to p as conclusion is not deductively invalid but lacks any power of conviction, since no one who questioned the conclusion could concede the premise.

Example: We must fight them over there so that we won't have to fight them over here.

(5) The fallacy of false cause (*non causa pro causa*) mislocates the cause of one phenomenon in another that is only seemingly related. The most common version of this fallacy, called *post hoc ergo propter hoc* ("after which hence by which"), mistakes temporal sequence for causal connection--as when a misfortune is attributed to a "malign event," like the dropping of a mirror.

A similar case is *cum hoc ergo propter hoc*, or mistaking correlation for causation. “Crime and poverty are typically correlated; therefore poverty causes crime.”

Another version of this fallacy arises in using *reductio ad absurdum* reasoning: concluding that a statement is false if its addition to a set of premises leads to a contradiction. This mode of reasoning can be correct--e.g., concluding that two lines do not intersect if the assumption that they do intersect leads to a contradiction. What is required to avoid the fallacy is to verify independently that each of the original premises is true. Thus, one might fallaciously infer that Williams, a philosopher, does not watch television, because adding--

A: Williams, a philosopher, watches television.

to the premises

P1: No philosopher engages in intellectually trivial activities.

P2: Watching television is an intellectually trivial activity.

--leads to a contradiction. Yet it might be that either P1 or P2 or both are false. It might even be the case that Williams is not a philosopher. Indeed, one might even take A as evidence for the falsity of either P1 or P2 or as evidence that Williams is not really a philosopher.

(6) The fallacy of many questions (*plurimum interrogationum*) consists in demanding or giving a single answer to a question when this answer could either be divided (example: "Do you like the twins?" "Neither yes nor no; but Ann yes and Mary no.") or refused altogether, because a mistaken presupposition is involved (example: "Is it true that you no longer beat your wife? A yes or no answer will still be an admission of guilt to wife-beating.").

(7) The fallacy of *non sequitur* ("it does not follow") occurs when there is not even a deceptively plausible appearance of valid reasoning, because there is an obvious lack of connection between the given premises and the conclusion drawn from them. “Cleanliness is next to godliness.” Some authors, however, identify *non sequitur* with the fallacy of the consequent (see below Formal fallacies) and the Fallacy of False Cause (above).

Formal fallacies

Formal fallacies are deductively invalid arguments that typically commit an easily recognizable logical error. A classic case is Aristotle's fallacy of the consequent, relating to reasoning from premises of the form "If p_1, then p_2." The fallacy has two forms:

(1) denial of the antecedent, in which one mistakenly argues from the premises "If p_1, then p_2" and "not-p_1" (symbolized p_1) to the conclusion "not-p_2" (examples: “If Socrates is in Athens, then Socrates is in Greece; but Socrates is not in Athens; therefore, Socrates is not in Greece.” “If George is a man of good faith, he can be entrusted with this office; but George is not a man of good faith; therefore, George cannot be entrusted with this office"), and

(2) affirmation of the consequent, in which one mistakenly argues from the premises "If p_1, then p_2" and "p_2" to the conclusion "p_1" (examples: “If Socrates is in Athens, then Socrates is in

Greece; Socrates is in Greece; therefore, Socrates is in Athens." "If Amos was a prophet, then he had a social conscience; he had a social conscience; hence, Amos was a prophet").

Most of the traditionally considered formal fallacies, however, relate to the syllogism. One example may be cited, that of the fallacy of illicit major (or minor) premise, which violates the rules for "distribution." (A term is said to be distributed when reference is made to all members of the class. For example, in "Some crows are not friendly," reference is made to all friendly things but not to all crows.) The fallacy arises when a major (or minor) term that is undistributed in the premise is distributed in the conclusion (example: "All tubers are high-starch foods [undistributed]; no squashes are tubers; therefore, no squashes are high-starch foods [distributed]").