** Newton on Experimental Method **

Below are paraphrases of Newton's *regulae philosophandi* from the third book of the *Philosophiae naturalis principia mathematica*, third edition, 1726.

1. Nature is essentially simple; therefore, we should not introduce more hypotheses than are sufficient and necessary for the explanation of observed facts. This is the principle, or rule, of simplicity.

2. Hence, as far as possible, similar effects must be assigned to the same cause. This is the principle of uniformity of nature.

3. Properties common to all those bodies within reach of our experience are to be assumed (even if only tentatively) as pertaining to all bodies in general. This is a reformulation of the first two hypotheses, and is needed for forming universals.

4. Propositions in science (experimental philosophy) obtained by wide induction (i.e., induction to a universal generalization) are to be regarded as exactly true or approximately true until phenomena or experiments show that they may be corrected or are liable to exceptions. This principle states that propositions induced on the basis of experiment should not be confuted merely by proposing contrary hypotheses.

Koyré has shown that Newton had, in fact, written a *fifth* rule which was suppressed in all published versions of the *Principia*:

5. Whatever is not derived from things themselves, whether by the external senses or by internal cognition, is to be taken for hypotheses. . . . And what neither can be demonstrated from the phenomena nor follows from them by argument based on induction, I hold as hypotheses.

Instead, Newton tucked this methodological principle into the folds of the General Scholium to Book Three--where it is, in effect, restricted to propositions concerning the ultimate causes of gravitation:

> But hitherto I have not been able to discover the cause of those properties of gravity from phenomena, and I frame no hypotheses (*hypotheses non fingo*); for whatever is not deduced from the phenomena is to be called an hypothesis; and hypotheses, whether metaphysical or physical, whether of occult qualities or mechanical, have no place in experimental philosophy.

So, the question arises: WHY DID NEWTON SUPPRESS THE FIFTH RULE?