

Lecture 12

Bacon on Forms

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Three things

1 Forms

- The form of a thing is its formal cause, which is its definition, what it is to be a thing of that kind.
- Example: Bacon believes the form of heat is motion of a certain kind.

2 Latent processes

- These are the processes, which are mostly invisible, that connect the efficient and material cause to the effect.
- Example: The process of nutrition, from eating through to assimilation of food. [5]

3 Latent configurations

- The structure or composition of bodies, which is mostly invisible.
- This includes the chemical constitution of bodies and the microscopic structure of their parts.

Other kinds of cause

It is a correct position that “true knowledge is knowledge by causes.” And causes again are not improperly distributed into four kinds: the material, the formal, the efficient, and the final. But of these the final cause rather corrupts than advances the sciences, except such as have to do with human action. The discovery of the formal is despaired of. The efficient and the material (as they are investigated and received, that is, as remote causes, without reference to the latent process leading to the form) are but slight and superficial, and contribute little, if anything, to true and active science. [2]

Properties of forms

The form of a nature is such, that given the form, the nature infallibly follows . . . Again, the form is such that if it be taken away the nature infallibly vanishes . . . Lastly, the true form is such that it deduces the given nature from some source of being which is inherent in more natures, and which is better known in the natural order of things than the form itself. [4]

Introduction [10]

First of all we must prepare a natural and experimental history, sufficient and good; and this is the foundation of all, for we are not to imagine or suppose, but to discover, what nature does or may be made to do.

But natural and experimental history is so various and diffuse that it confounds and distracts the understanding, unless it be ranged and presented to view in a suitable order. We must therefore form tables and arrangements of instances, in such a method and order that the understanding may be able to deal with them.

The three tables [11–13]

Instances are to be arranged in three tables:

- **Table of presence:** Instances of different kinds in which the nature being investigated is present.

Example: The rays of the sun are hot.

- **Table of absence in proximity:** Instances in which the nature being investigated is absent but which are similar to those in which it is present.

Example: The rays of the moon are not hot.

- **Table of degrees:** Instances in which the nature being investigated is found in varying degrees.

Example: Burning iron is hotter than burning alcohol.

The exclusive part of induction [18]

Reject properties that are shown by the tables to be not necessary for the nature being investigated, or not sufficient.

- **In the table of presence:** Reject any property that is absent in any instance, because it isn't necessary.

Example: *On account of the rays of the sun, reject the nature of the elements.* (Bacon assumes that heaven and Earth are composed of different elements, whereas the Sun's rays travel from heaven to Earth.)

- **In the table of absence in proximity:** Reject any property that is present in any instance, because it isn't sufficient.

Example: *On account of the rays of the moon . . . reject light and brightness.*

- **In the table of degrees:** Reject any property that doesn't covary with the nature being investigated.

Example: Burning iron has more heat but less brightness than burning alcohol, so reject light and brightness (again).

The first vintage [20, translation modernized]

Since truth will sooner come out from error than from confusion, I think it expedient that the understanding should have permission, after the three Tables of First Presentation (such as I have exhibited) have been made and weighed, to attempt the Interpretation of Nature in the affirmative way, on the strength both of the instances given in the tables, and of any others it may meet with elsewhere. Which kind of attempt I call the Indulgence of the Understanding, or the Commencement of Interpretation, or the First Vintage.

- This is a hypothesis about what the form is. Differences from anticipation of nature:
 - The hypothesis is based on systematically collected data.
 - Many alternative hypotheses have been ruled out.
 - The hypothesis will be tested further.
- Bacon's first vintage concerning the form of heat:
 - Genus: Motion.
 - Differentia: Expansive, upwards, vibrating, rapid.

- 1 Bacon says science should aim to discover (a) forms, (b) latent processes, and (c) latent configurations. Explain what he means by these three things.
- 2 Bacon says that for the discovery of forms, instances should be arranged in three tables. What are these tables called and what do they contain? How is each used in the exclusive part of induction?
- 3 What does Bacon mean by the “first vintage”? How does this differ from a hypothesis arrived at by the method Bacon calls anticipation of nature?



Francis Bacon.

Novum Organum.

London, 1620.

[English translation on the web](#); quotations are from this.

Numbers in brackets are aphorism numbers from Book II.