

WHAT IS A SCIENCE?

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One of the basic problems of the philosophy of science is (or at least should be) that of exactly determining what a science is. A brief solution to this problem is proposed here on the basis of certain concepts introduced by the author in 'Contributions to syntax, semantics, and the philosophy of science' (*Notre Dame Journal of Formal Logic*, Vol. 5, 1964).

If we consider some of the sciences (for example, mathematics, physics, astronomy, geology, biology, and psychology), we find that each of them contains not just one theory, but finitely many; moreover, each of the contained theories is associated in the science with a system which determines to what extent that theory is adequate with respect to a set of objects that the science deals with. This state of affairs can be reconstructed as follows:

Definition 1. t is a theoretical system just in case s is an 8-term sequence such that

- (1) $t(1)$ is a symbol sequence
- (2) $t(2)$ is a theory in s
- (3) $t(3)$ is an interpreter with respect to s
- (4) $t(4)$ is a finite subset of $U(t(3))$
- (5) $t(5)$ is a finite or denumerably infinite sequence whose range is included in the set of all theorems of $t(1)$ by $t(2)$
- (6) $t(6)$ is a finite or denumerably infinite sequence whose range is included in the set of all formulas of $t(1)$
- (7) $t(7)$ is included in the set of all formulas of $t(1)$
- (8) $t(8)$ is a finite or denumerably infinite sequence whose range is included in the set of all theorems of $t(1)$ by $t(2)$.

Definition 2. If t is a theoretical system, then

- (1) the degree of confirmation of t = the degree of confirmation of $t(2)$ with respect to $t(3)$, $t(4)$, $t(5)$, and $t(1)$
- (2) the explanatory power of t = the explanatory power of $t(2)$ with respect to $t(6)$ and $t(1)$
- (3) the degree of deductive simplicity of t = the degree of deductive simplicity of $t(2)$ with respect to $t(7)$, $t(8)$, and $t(1)$

Received March 27, 1962