

## **Module 2: Organisation of Production of Scientific Knowledge and Professionalisation of Science**

### **Lecture 10**

#### **Science as Social Institution and the Ethos of Science**

Science is a deceptively inclusive word which refers to a variety of distinct though interrelated items. It is commonly used to denote (1) a set of characteristic methods by means of which knowledge is certified; (2) a stock of accumulated knowledge stemming from the application of these methods; (3) a set of cultural values and mores governing the activities termed scientific; or (4) any combination of the foregoing. We are here concerned in a preliminary fashion with the cultural structure of science, that is, with one aspect of science as an institution. Thus, we shall consider, not the methods of science, but the mores with which they are hedged about. To be sure, methodological canons are often both technical expedients and moral compulsives, but it is solely the latter which is our concern here. This is an essay in the sociology of science, not an excursion in methodology. Similarly, we shall not deal with the substantive findings of sciences (hypotheses, uniformities, laws), except as these are pertinent to standardized social sentiments about science. This is not an adventure in polymathy.

The ethos of science is that affectively toned complex of values and norms which is held to be binding on the man of science.<sup>1</sup> The norms are expressed in the form of prescriptions, proscriptions, preferences, and permissions. They are legitimized in terms of institutional values. These imperatives, transmitted by precept and example and reinforced by sanctions are in varying degrees internalized by scientists, thus fashioning their scientific conscience or, if one prefers the latter-day phrase, their superego. Although the ethos of science is not codified, it can be inferred from the moral consensus of scientists as expressed in use and wont, in countless writings on the scientific spirit and in moral indignation directed toward contraventions of the ethos.

An examination of the ethos of modern science is only a limited introduction to a larger problem: the comparative study of the institutional structure of science. Although detailed monographs assembling the needed comparative materials are few and scattered, they provide some basis for the provisional assumption that “science is afforded opportunity for development in a democratic order which is integrated with the ethos of science.” This is not to say that the pursuit of science is confined to democracies. The most diverse social structures have provided some measure of support to science. We have only to remember that the Academia del Cimento was sponsored by two medicis; that Charles II claims the historical attention for his grant of a charter to the Royal Society of London and his sponsorship of the Greenwich Observatory; that the Academie des Sciences was founded under the auspices of Louis XIV, on the advice of Colbert; that urged into acquiescence by Leibniz, Frederick I endowed the Berlin Academy, and that the St. Petersburg Academy of Sciences was instituted by Peter the Great (to refute the view that Russians are barbarians). But such historical facts do not imply a random association of science and social structure. There is the further question of the ratio of scientific achievement

to scientific potentialities. Science develops in various social structures, to be sure, but which of them provide an institutional context for the fullest measure of development?

The institutional goal of science is the extension of certified knowledge. The technical methods employed toward this end provide the relevant definition of knowledge: empirically confirmed and logically consistent statements of regularities (which are, in effect, predictions). The institutional imperatives (mores) derive from the goal and the methods. The entire structure of technical and moral norms implements the final objective. The technical norm of empirical evidence, adequate and reliable, is a prerequisite for sustained true prediction; the technical norm of logical consistency, a prerequisite for systematic and valid prediction. The mores of science possess a methodologic rationale but they are also binding, not only because they are procedurally efficient, but because they are believed right and good. They are moral as well as technical prescriptions.

### **The Normative Structure of Science**

Merton distinguishes four senses of the term ‘science’. Which does he explore? Which did the previous authors we’ve read explore? What is the relationship between these different aspects of science?

Merton discusses the goals, methods, and imperatives of science, concluding that imperatives are binding “not only because they are procedurally efficient, but because they are believed right and good”. What are the imperatives and why are they not simply “procedurally efficient”?

Merton says that “Ethnocentrism is not compatible with universalism”. I want you to remember this quotation when we read Rorty and Harding in the coming weeks.

Merton remarks that the “communism of the scientific ethos is incompatible with the definition of technology as ‘private property’ in a capitalistic economy.” What is the communism of the scientific ethos? Do you agree or disagree that it is at odds with capitalism’s conception of technology?

Merton notes that science used to have an aura of invincibility and thus did not have to reflect upon its social status. More recently, however, anti-intellectualism has become more rampant, leading “scientists to recognize their dependence on particular types of social structure” (267). In particular he cites scientists becoming aware of their “obligations and interests” (268)

Merton disambiguates four senses of science:

- (1) A set of characteristic methods by means of which knowledge is certified;
- (2) A stock of accumulated knowledge stemming from the application of these methods;
- (3) A set of cultural values and morés governing the activities termed scientific; and
- (4) Any combination of the foregoing.

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### Notes and References

<sup>i</sup> On the concept of ethos, see William Graham Sumner, *Folkways* (Boston: Ginn, 1906), 36 ff.; Hans Speier, “The Social Determination of Ideas,” *Social Research* 5 (1938): 196 ff.; Max Scheler *Schriften aus dem Nachlass* (1933; reprint, Bern, 1957), 1: 225-62. Albert Bayet, in his book on the subject, soon abandons description and analysis for homily; see his *La morale de la science* (Paris, 1931).