

CHAPTER 7*

THE FORMAL STRUCTURE OF AN EMERGING
SCIENCE OF EDUCATION

PART II: THE CONCEPT OF SCIENCE

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TRANSITION: Education is any and all kinds of knowledge about education. One of the kinds that is possible is scientific knowledge about education, or science of education. In Chapter 3, Monshouer reviewed some of the rival conceptions of 'science of education' in contemporary Europe, Great Britain, and the United States. That review, in the context of Brezinka and Maccia's discussions of European contributions of educology and root suppositions of knowledge about education, established the setting for Steiner's development of the conception of educology and Christensen's explication of relationships between educology and other concepts common in discourse about education. Now, Monshouer picks up the theme of science of education and investigates essential characteristics of an adequate conception of 'science of education'.

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1. PRELIMINARIES

It has slowly but surely become customary in our civilization for scientific knowledge to be regarded, if not as the highest form of knowledge, then at least as a paradigm for all other forms of knowledge. We are taught from childhood that scientific knowledge is better than non-scientific knowledge, as if this were really self-evident.

We will not consider what historical process led to this being considered as self-evident, nor will we consider the question of whether this process was linear or not. Similarly we cannot consider the question of whether this process always took place completely unconsciously, without due consideration. What we are concerned about is the statement (and this is not completely original)¹ that our current era is characterized to a substantial extent by a scientific attitude.

This scientism² is no longer a particular view within the philoso-

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phy of science, based on a (justified or unjustified) optimism concerning the development of a certain science or sciences (such as for example during the second half of the 19th century and the first decades of the 20th century as a result of the enormous advances made by disciplines such as physics, biology, etc.). It is rather a general, basic attitude which is more implicit than explicit and which should maybe rather be explained by the unprecedented technical developments than by the advances made by sciences themselves.

Many practical effects can be attributed to this disguised or undisguised scientism: For example, the structure of our educational system which is, after all, biased towards cognitive intelligence;³ or the irrational and exaggerated esteem which exists, particularly in Europe, for academic titles; or the fact that, as Habermas (1968a, pp. 48ff.) asserts, to an increasing extent not only political decisions are taken by scientists and technologists (with their own way of thinking), but also technocratic thought can penetrate into the consciousness of the depoliticized mass of the population as background ideology, and can take on the function of a legitimation of practical decisions.⁴ However important these and many other consequences of scientistic thought might be, we cannot go into them more deeply in this context. Only one of them is of direct importance to the issue at hand, namely the fact that the question as to the nature of science is seriously biased by scientism.

As a result of the scientistic attitude described above, every real or imagined discipline will strive to acquire the title of "science" and preferably even to be recognized as an academic discipline. Thus for years, strenuous efforts have been made, particularly in West Germany, but also in English-speaking countries,⁵ to demonstrate the separate identity of a discipline of education. These attempts are without doubt based partly on the existing and continuing differences of opinion within the general philosophy of science and in particular on the distinction which we make between S_1 and S_2 (cf. below; unfortunately this distinction is not usually raised for discussion in the subject debates). But these efforts are at the same time a clear example of the phenomenon that in this matter fashionable opinions can clearly win the day over detached, meta-theoretical analyses. Thereby, a shift takes place from *prior* legitimation on logical grounds to legitimation *afterwards*⁶ on the basis of accidental, contingent facts. In addition, all too often the naive principle is followed that "there is a one-to-one correlation between realms and disciplines" and that "every realm of things must be the object of some discipline," a principle which was correctly labelled by Scheffler (1966, pp. 66-68) as "clearly fallacious."

On the one hand, there is a struggle to achieve at all costs the official status of science, whether this be a so-called "science of the transcendental meditation" or the "science of education."⁷ On the other hand, certain activities (such as family therapy, sensitivity training, etc.) are so intensively state-subsidized that in the long run people conclude that they are forms of science.⁸

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In order to make possible a rational answer to the question, "What is a science," it is necessary to reject the scientism described above and all its practical consequences (in particular the status advantages of the title "scientific"). Only then is there a reasonable chance that the discussion will not develop into a power struggle. For this reason, I wish to use as my starting point the following epistemological thesis:

Thesis₁ Scientific knowledge is not the only valid form of knowledge nor is it the highest form of knowledge. It is not impossible, indeed it is possible, that other forms of knowledge are more important for human existence than scientific knowledge.

2. DEFINITIONAL PROBLEMS

Soltis (1968, pp. 18 ff.) has pointed out somewhat ironically and playfully, but nevertheless effectively, "that characterizing a discipline is a most difficult if not impossible undertaking" (p. 25). His arguments give rise to the following starting point:

Thesis₂ In absolute terms the concept of science in the end can only be defined stipulatively.⁹

This is equivalent to asserting that, strictly speaking, every definition of the concept of science is arbitrary and can neither be true nor false since it is after all based purely on an implicit or explicit agreement. We should, it is true, recognize that the concept of science can also give rise to an analytical (cf. Opp, 1970, pp. 103 ff.) or lexical (cf. Robinson, 1954, pp. 35 ff.) or descriptive (cf. Scheffler, 1960, Chapter I) definition which can be true or false since it is based on an empirical reference, namely current or former use of language. But it is clear that this form of definition can offer no solution to the problem with which we are here concerned, namely bringing a certain amount of order to the patchwork of conceptions of science, since a definition of this kind can go no further than to establish the fact that this diversity exists.

Furthermore, *Thesis₂* implies that the possibility of an essential or real definition¹⁰ of the concept of science is rejected with the principal argument that one would have to view things from a supra-historical point outside the actual practice of science in order to make such a real definition. This means that only pragmatic arguments can be used in making a choice between what will be defined as scientific and non-scientific.

Thus, although every definition of the concept of science is, when looked at in absolute terms, completely arbitrary, the *function* of a definition in general nevertheless places on us certain obligations. The

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principle function of a definition is without any doubt unambiguous transfer of information. In view of the principally stipulative character of our definition, the requirement of non-ambiguity can be satisfied by as great a degree as possible of "operationalization" (cf. below). The requirement of transfer of information can be translated into the requirement that a definition must possess *as great a power of information as possible*. Now the two most important principles of power of information are as follows:

- i. the more general the logical subject of a statement, the more information power it possesses (cf. Opp, 1970, pp. 166 ff.);
- ii. the more falsificators (in the logical predicate) a statement includes, the more power of information it possesses. ¹¹

The first principle is of minor importance for our problem since in our case we are evidently talking about definition along the lines of "it is true for all forms of science that" The second principle which in some philosophies of science is often overlooked, is however extremely important and gives rise to:

Thesis₃ In view of the information function of a definition in general it is advisable also when defining the concept of science to give as narrow a definition as possible.

These starting points are however by no means sufficient. Strictly speaking, with only *Thesis₂* and *Thesis₃* as given information, one could easily decide to define the concept of science as "the ability to draw the letter A." Why does such a definition sound strange despite the fact that in absolute terms it is irreproachable? This is because it conflicts with common use of language. An important factor here is clearly that science already exists as an empirical phenomenon (even if one conceives science as "referring to linguistic entities only" {Rudner, 1966, p. 8}) and that furthermore much thought has already been devoted to the concept of science.

The above mentioned principles of power of information are clearly insufficient to guarantee the functionality of a definition with the result that a third principle appears to be indispensable, namely:

Thesis₄ An attempt to define concepts which refer to an empirical reality should take account of the substantial functionality of those concepts, particularly with a view to achieving greater power of information.

Under "functionality" I understand here for the time being (cf. below) as close a relationship to common use of language as possible (in order

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to avoid as far as possible the occurrence of surplus meanings {cf. De Groot, 1969, pp. 66 ff.}), but at the same time without detracting from the other principles of definition. Although in absolute terms this criterion of functionality is completely relative (and thereby represents a confirmation of *Thesis₂*) we cannot just push aside for pragmatic reasons the communicative element contained therein.

Apparently an analysis of the various meanings which the concept of science contains and contained is more important than at first appeared from *Thesis₂*. This brings us to the following refinement of the previous thesis:

Thesis₅ Although in absolute terms a definition of the concept of science (being a concept with empirical references) is of a stipulative nature, an analytical element in the definition of this concept is indispensable for the sake of greater power of information (cf. *Thesis₄*). This does not however impair substantially the fundamentally stipulative character of the definition.¹²

For the rest this thesis does not mean much more than that in the English language you should not call a particular seat a tiger, nor a particular form of wild animal a chair.

We have hereby maneuvered ourselves into an extremely difficult position: if *Thesis₅* is correct it is impossible to maintain *Thesis₃* (in view of the varying opinions on what science and science of education are and considering the scientism described earlier by us) so that we would do better to end our account here. On the other hand, if we hold fast to *Thesis₃* we must drop *Thesis₅* unless we succeed in turning up other criteria or formulating our earlier statements in another way. In other words, if we accept anarchism in the style of Feyerband (1970) with respect to the philosophy of science, we irrevocably contradict *Thesis₃*; however, if we accept *Thesis₃* without correction or amplification we will have to restrict ourselves to a sort of programmatic definition of the concept of science, which makes any chance of association with the current meaning of this term improbable from the start.

And yet this apparent antithesis can be resolved: In the first place it is nowhere stated that definition of the concept of science is *complete*, only that in *absolute terms* it is completely stipulative. In the second place there is no *complete* contradiction between, on the one hand, the requirement that a definition should be as narrow as possible and, on the other hand, the requirement that a definition of a concept which refers to an existing empirical entity must be a relationship to common use of language.¹³

I believe that I can resolve this paradox by specifying more closely the principle of functionality referred to earlier: