

DIMITRI GINEV

THE HERMENEUTIC CONTEXT OF CONSTITUTION

In this paper I concentrate on two distinctions introduced by Patrick A. Heelan. At stake in the distinction between weak and strong hermeneutics of natural science is the issue of the possibility of an interpretative-ontological approach to the rationality of science. The distinction between cultural praxis-laden meaning and theory-laden meaning has much to do with a philosophico-hermeneutic critique of the account of scientific theory elaborated in the post-positivist philosophy of science. My primary aim is to show that the “hermeneutic turn” in the philosophy of science as informed by the two distinctions allows one to delineate a particular context of scrutinizing science. In opposing both the normative epistemology (the rational reconstruction of science’s cognitive structure) and the deconstruction of epistemology (the denunciation that there are aspects of science’s cognitive structure which have to be approached as non-empirical objects of inquiry), I shall treat this hermeneutic *context of constitution* as an alternative to the context of justification and the context of discovery. What I am referring to is an attempt to forge a notion of scientific rationality by studying the hermeneutic fore-structure of scientific research.¹ It is my aim to show that in the context of constitution one can hold the view that (*pace* Rorty) the science-nonscience opposition “cuts culture at a philosophically significant joint” without appealing to the uniqueness of epistemological features like a special method, or a special relation to reality.

1. WEAK AND STRONG HERMENEUTICS OF SCIENCE

Weak hermeneutics of science is a heading for all interpretative studies of the production of scientific texts and the forms of scientific communication (including the historical dynamics of these forms). The kernel of these studies is the comparative analysis of the author-text-reader relationship constitutive of different genres of scientific publications – working papers, journal articles, monographs, volumes of essays, textbooks, yearbooks, and so on. Ideas and programs of weak hermeneutics of science are developed in a wide range of disciplines – history of ideas, cultural history, rhetoric (both as informal logic of argumentation and as literary rhetoric), media and communication studies, cultural studies, social psychology, literary criticism, and others. Champions of weak hermeneutics are predominantly preoccupied with the historico-cultural being of scientific languages. In particular, they are interested in the

communicative openness of the idealized (formalized, standardized) languages of natural science. The specification of this interest in the framework of the comparative analysis of the author-text-reader relationship helps one to address issues like the “implicit reader” as a mediator between production and reception of scientific texts, the historical distance necessary that a scientific text may gain a status of classical work, the role the “generic characteristics” of the different types of linguistic representations of scientific results play in the formation of communicative spaces in scientific communities’ life-worlds, the ways of achieving a depersonalization of scientific texts’ authorship, and so on. (To the weak hermeneutics of natural science one should attribute also the studies in the “rhetorical production of epistemic objectivity and axiological neutrality” as well as the interpretative studies of the historico-cultural forms of popularizing natural science.)

A *sui generis* transition from weak to strong hermeneutics of science is represented by the approaches of authors (e.g., Robert Crease)² who are trying to disclose the role of interpretation in the “production” of experimental objects. Like the champions of the weak hermeneutics, these authors concentrate on the specificity of scientific languages. In contrast to the former, the latter hold a much broader concept of scientific language. According to them, the language of science arises first and foremost from and is addressed to experimental practices. Following this view, they go on to recast claims raised by the champions of the weak hermeneutics in terms of a context that includes aspects of the cognitive structure of scientific research. For example, they recast the problematics of the reading process in a manner that allows one to construe the experimentation (and not only the reception of scientific texts) in terms of such a process. By suggesting a hermeneutics of the reading process of what is written on the instruments of experimentation, these authors evoke Galileo’s conception that scientific research is a reading of the Book of Nature. It is this orientation towards an “exegesis of the experimental practices” that leads to the problematics of the strong hermeneutics of science.

In what follows, I use the expression of “strong hermeneutics of science” to designate studies in the hermeneutic phenomenology of the process of constituting domains of scientific research. The basic claim of weak hermeneutics is the impossibility of a hermeneutic approach to natural science’s cognitive content. More specifically, champions of the weak hermeneutics contest the relevance of the post-Heideggerian ontologizing approach to natural scientific practice and the cognitive constructions arising out of this practice. On the principal argument for this claim, the ontologizing approach does not have resources for answering the question of why the interests and methods of hermeneutic philosophy can not, from the viewpoint of natural scientific practice, help in reaching a deeper understanding of scientific rationality. A leading exponent of the weak hermeneutics goes on to say that “it is insufficient to indicate or to demonstrate that some of philosophical hermeneutics’ ideas and concepts are nevertheless applicable in some sense to the field of natural scientific inquiry as well.”³

Heelan’s defense of the strong hermeneutics of natural science is by no means restricted to indicating and commenting particular examples of such an applicability.⁴ For Heelan, a strong hermeneutic philosophy of natural science must center on the phenomena of research praxis as these make their appearance in scientific communities’ laboratory everydayness. The task is not to derive meanings from texts

and other representations used in the process of communication, but to highlight the fore-structuring of scientific phenomena in the living-worldly horizons of laboratory everydayness. The problem-situation that brings into the world the program of strong hermeneutics concerns the way of covering theoretical discontinuities by a unity of practices of scientific research.⁵

2. THEORY-LADENNESS AND CULTURAL PRAXIS-LADENNESS

Heelan's starting-point in working out this distinction is the thesis that theory and praxis are coordinated in a complex manner that follows a repetitive pattern, from theory to praxis, then back to theory. He uses the metaphoric notion of "hermeneutic spiral" in order to illuminate both the cycling and the progressive character of scientific research. In my view, this processual interpretation of theory-praxis relation in the research process is a *mutatis mutandis* specification of the relation between understanding, prejudice, application and tradition as it is construed in Gadamer's conception of "effective history." More generally, Heelan's treatment of the "hermeneutic spiral" between theoretical understanding and practical instrumentation provides a rationale for giving meaning to the notion of "effective-historical consciousness" operative in the process of scientific research. Heelan's distinction between theory-laden meaning and praxis-laden cultural meaning in the process of scientific research may be seen against this background.

The experimental equipment involved in laboratory everydayness is semantically theory-laden, whereas the experimental observations are semantically praxis-laden like "all dedicated or designated cultural objects of the lifeworld presented as fulfilling experience." The types of meaning corresponding to the two kinds of ladenness are not independent, for the theory-laden meaning makes sense only in the process of using the experimental equipment in the practices of scientific research. Thus, the two kinds of meaning's constitution are involved in an interplay that informs the dynamics of scientific research. On Heelan's account, the process of measurement mediates this interplay, for it fulfills two coordinated functions. "It presents the *objects-as-measurable*, this is the praxis-laden cultural function. And it takes the data from the presented object, this is the theory-laden *data-taking* process. These are the binary valences of scientific data. The data-taking is usually called 'observation'; but there is no 'observation' without the prior preparation and presentation of the object-as-measurable as a system open to the data-taking process."⁶

There are overtones of Gadamer's priority of *phronesis*-rationality over epistemic rationality in all this. But Heelan is much more radical than the representatives of the contemporary hermeneutic philosophy. When Gadamer, for instance, goes on to demonstrate the "universality of the hermeneutic problem" through overcoming the various kinds of the "experience of alienation" in modern culture, he does not forget to pay attention to the task of reintegrating the natural-scientific research in the "conversation in which we are all caught up together." But in so doing, Gadamer takes for granted the monological character of scientific inquiry. For him, to reintegrate natural science in culture's dialogical experience means only to disclose the dependence of all scientific constructions upon the primordial "hermeneutic experience of the world" to which the "linguistic constitution of the world" corresponds. In contrast to this attitude to natural science, Heelan's strong program is an attempt not

only to reintegrate the (allegedly monological) scientific research in the hermeneutic experience, but to reveal the intrinsic hermeneutic experience within the research process.⁷

3. OVERCOMING THE TRADITIONAL CONTEXT-DISTINCTION

In its critique of the “stubborn” epistemological dilemmas in the philosophy of science, Professor Heelan’s strong program seems akin to Shapere’s⁸ piecemeal approach to science’s cognitive structure. I shall pay a special attention to this approach, since its comparison with the strong program provides an opportunity to draw a clear demarcational line between (ontological) hermeneutics of science and (non-essentialist) epistemology of science.

Shapere’s approach represents an interesting attempt in the philosophy of science to overcome the essentialist view of scientific rationality without succumbing to a certain form of cognitive relativism. Shapere opposes the relativist rejection of the view that changes in the epistemological criteria of scientific rationality are not themselves rational. I share his critique of essentialism as a supposition that there are constitutive features of science, themselves not open to revision in the light of science’s historical dynamics. Shapere is absolutely right when insisting that there is a chain of developments connecting the set of first-level criteria of doing research as a rational enterprise and the set of second-level criteria assessing the historical progress in science. Through this chain one can trace a “rational evolution” between the intrinsic rationality of everyday research work and the rationality of science’s historical dynamics. Unfortunately, Shapere leaves us without a clear idea of how to reconstruct the “traceable relationship of changes,” although the success of his antiessentialism depends crucially on such a reconstruction. Since he is not willing to transcend the epistemological framework of analysis of scientific rationality, his antiessentialist approach (the approach that operates without invoking some kind of transcendental argument, or invariant essence) does not enable one to specify the rationality of the changes taking place in the “rational evolution” between the two sets of criteria. In avoiding the shortcomings of the essentialist metascience, Shapere’s undertaking is not so successful in figuring out an alternative to relativism. The specter of relativism comes back in his piecemeal approach through the back door.

According to the central thesis that will emerge in the rest of this essay, a full-fledged defense of the antiessentialist approach to scientific rationality demands a move from epistemology to hermeneutics. In other words, a cogent version of antiessentialism, which does not collapse into a kind of relativism, requires a hermeneutico-philosophical context of scrutinizing science. It is this context that I called earlier the context of constitution. Basic here is the distinction between *hermeneutic fore-structure* and *cognitive structure* of scientific research. It can be construed as a further articulation of Heelan’s distinction between praxis-laden cultural meaning and theory-laden meaning in the research process.

The structural unit of scientific research I shall refer to in my further elaborations is the domain. On Shapere’s definition, domain is each body of information constituted by items for which an answer to an important problem is expected. (Let me refer to molecular genetics as an example of scientific domain. The main items in this domain are the molecular structure of the gene; the central role of DNA and RNA in the

production of various structural, catalytic, and regulatory proteins; decreased enzyme production; biosynthetic pathways; the network of chemical reactions between genes and gross phenotypic structures; and the phenomena as epistasis, pleiotropy, and the position effect which have no satisfactory explanations in terms of Mendelian genetics. Each item is characterized by a central problem, which is realized theoretically [or better, realized as a theoretical problem] by means of a model that provides an explanatory scenario as to how the problem is to be solved. For instance, the model that unifies in an explanatory scenario DNA replication, transcription to RNA, translation to protein, and the genetic code enables one to conceptualize the biosynthetic pathways as an item of molecular genetics. In fulfilling explanatory functions, each model is a specification of a domain's theory. This thesis needs a further qualification. A scientific domain with an internal theory that conceptualizes [without attracting models of external theories] all items is an extreme case which finds only a few real exemplifications. As a rule, in a domain of scientific research there are two or more [sometimes partially competing] theories. In addition, there are the so-called "interfield theories" which serve the functions in relating [through integral explanatory scenarios] items of two or more domains. Thus, the operon theory and theory of allosteric regulation are relating items of biochemistry and molecular genetics.) The semantico-structuralist picture of scientific domain, I will follow here, provides a good opportunity for analyzing the dynamic complementarity of hermeneutic and cognitive dimensions of scientific research.

On the one hand, a scientific domain is an open horizon for theorization, conceptualization, experimental instrumentation, and so on. It is a life-world of an interpretative community whose members have a basic consensus regarding the existence of kinds of theoretical objects (e.g., statistical states represented by a class operators in Hilbert space, physical magnitudes represented by hypermaximal Hermitian operators, etc.). This consensus is not due only to shared cognitive aims and methodological norms, and for that reason, it can not be subjected to a "rational reconstruction" in the context of justification. The belief in the esoteric theoretical objects is beyond the scope of this reconstruction. It is a belief that is grounded upon what Heidegger calls a fore-sight, a fore-having and a fore-conception of a community's interpretative mode of being-in-the-world. At the same time, this belief is the "source" of that "hermeneutic conservatism" (the lack of willingness to break down the horizon of expectation), which occupies a prominent place in Kuhn's conception of scientific revolution. Accordingly, the basic consensus regarding the existence of a kind of theoretical object is formed and maintained in the interpretative milieu of a community's laboratory everydayness. Yet, the reverse claim is also of prime importance for a strong hermeneutics of science: Without the community's belief in the existence of theoretical objects of a specific kind, a laboratory everydayness would be impossible.

On the other hand, a scientific domain is a set of semantic models related through conceptual apparatus and mathematical formalism of one or more (intrafield and interfield) theories. These models provide meaning to theoretical objects in whose existence a community of researchers believes. A domain's cognitive structure is at any particular moment a configuration of theoretical models, where each model refers to a number of phenomenal systems illustrating a domain's issue. (For example, a central issue in the domain of special relativity is the priority of Lorentz over Galilean

Hermeneutic Philosophy of Science, Van Gogh's Eyes,
and God

Essays in Honor of Patrick A. Heelan, S.J.

Babich, B. (Ed.)

2002, XVIII, 500 p., Hardcover

ISBN: 978-1-4020-0234-2