

**THE RELEVANCE OF THEORY—LADENNESS AND
INCOMMENSURABILITY, AND A SURVEY OF THE
CONTRIBUTIONS TO THIS ISSUE**

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The present-day discussion on theory-ladenness and incommensurability, to which this and the subsequent volume of *Philosophica* are devoted, has roots already in Plato. It became especially vehement and central according as it was realized, mainly as a consequence of the influence of Thomas Kuhn's *Structure of Scientific Revolutions* and notwithstanding Kuhn's denial, that the theory-ladenness theses and the incommensurability theses constitute a threat towards the rationality of science. Not only the received views on the rationality of the evolution of science, but the very possibility of interpreting the evolution of science as the result of some rational methodology, were challenged.

The main theses on theory-ladenness and incommensurability that are presented in contemporary philosophy of science papers boil down to three major ones :

- (1) Observational data — sometimes referred to as “facts” — are theory-laden; a person's observational data are partly dependent on the theory he or she adheres to. As a consequence theories are incommensurable with respect to observational data, i.e. there is no set of theory-independent such data from which competitive theories may be judged; each of two competitive theories has *its* facts.
- (2) Terms are theory-laden; their meanings depend essentially on the theories to which they belong. As a consequence theories are incommensurable in that no logical relations — entailment, inconsistency, etc. — obtain between their respective statements.
- (3) Methodological rules are theory-laden; different theories go along with, and are judged by their adherents in terms of, different methodologies. As a consequence theories are incommensurable

in that there are no (or not sufficient) common methodological rules which would enable one to order them according to their methodological merits.

The majority of adherents to these incommensurability theses intend them to apply to theories in the broad sense: paradigms, research programmes, research traditions, etc. Also, they interpret "theory-ladenness" with respect to those large scale entities. Apart from the three major incommensurability theses, several minor ones have been advanced. The latter concern terms, statements, problems, methodological rules, etc. In such cases "incommensurability" means the same as, or is at least co-extensive with, "theory-ladenness". Hence, the minor theses are identical to, or variations of, the first parts of (1)–(3).

According to Kuhn's original position, revolutionary periods form an exception and it is only during such exceptional periods that alternative theories are adhered to by significant numbers of scientists working in the domain. After 1962, however, philosophers of science challenged this view. A growing number of them allowed for the co-existence of competitive research traditions (etc.) and at the same time the methodological importance of this co-existence was appreciated. One clear culminating point of this tendency is Larry Laudan's *Progress and its Problems*, in which not only the evaluation of theories, but in a very specific way also the notions of progress and of rationality, are defined on a comparative basis; the progressive character and rationality of science depend essentially on the co-existence of alternative theories. According as the methodological importance of this co-existence became more appreciated, the incommensurability problems became more pregnant and urgent.

Three courses of action are open to those who want to defend the rationality of the scientific enterprise in connection with theses (1)–(3). The first consists in arguing against the forms of theory-ladenness on which the incommensurability theses rely. As a second course of action one might grant those forms of theory-ladenness, but argue against their entailing the connected form of incommensurability. Finally, one might accept the theses (1)–(3) in full, and hence accept that there is no way of comparing distinct theories in terms of some single measuring system, but nevertheless argue that rational choices between alternative theories are possible because one may, perhaps crudely only, compare the outcomes that result from applying to each theory the measuring system that is

appropriate for this theory. After all, one may rationally prefer to perform one piece of music on a good violin, rather than performing another piece of music on a bad organ.

The wide variety of problems and possible attacks is quite well illustrated by the contributions to the present and subsequent volume of this journal. I shall now give a brief survey of the contributions to the present volume (and do likewise in the subsequent one). I shall not try to summarize them and, being a contributor to the subsequent volume myself, refrain from all critical comments, except for stating that I found each of the contributions instructive, illuminating and, where I disagreed, challenging.

Surprised by the historical unawareness of those who engage in the present-day debate, Joseph Agassi reviews the problem of theory-ladenness of observational evidence from Galileo and Bacon up to Popper. As his survey proceeds, the problem is thrown light upon from the different methodological systems and hence gains in richness and nuance. E.g., extensive attention is paid to the Quine-Duhem thesis, both for its own sake and in relation to Popper's methodology.

The views of Popper, with which Agassi concludes his survey, are the object of Robert Nola's attack. He points out that Popper's rejection of the observational/theoretical distinction derives from the fact that he considers theoretical statements to be involved in the meanings of all terms. Nola shows in detail how the unacceptable consequences of the latter view on meaning may be avoided by adopting Kripke's 1972 view on reference.

Alan Musgrave takes Nola's paper as his starting point. He argues against the thesis that all universal terms are dispositional, which was Popper's main argument for the theoretical character of all universal terms. But at the same time Musgrave also points out the difficulties of the Kripkean theory of meaning (and of the Mill-Frege theory). In contradistinction to Frické, he arrives, by presenting arguments independent of Popper's, at the conclusion that all universal terms are theoretical and that observation statements are theory-laden.

The contribution by Martin Frické also deals with the theory dependence of observation, but Frické engages in an attack on the theory-ladenness thesis as propounded by post-Popperian philosophers of science. He considers the interesting arguments for this thesis already refuted, but engages in a further refutation based on the existence of enduring objects which "are perceived although not

always as they are and not always directly". He analyzes in detail a large number of arguments in favour of theory-ladenness and maintains that they may be rejected by making the distinction between the objects perceived and the sensations we experience, and by avoiding to confuse our disagreement about the world with our living in different worlds.

In the final contribution to this first volume Noretta Koertge stresses the methodological importance of theoretical pluralism and rejects "misguided monolitism" as well as "protective partitioning" (i.e. protecting theories against criticism by assigning a distinct domain to each of them). Although she largely relies on arguments propounded by Feyerabend in this respect, she does not subscribe to the incommensurability theses. Koertge offers an extensive survey of arguments in favour of the incommensurability of theories and answers each of these by actually proposing methods for comparing alternative theories. She also briefly criticizes current science education in view of her methodological theses.

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