COHEN, Robert S. and WARTOFSKY, Marx W. (Eds.), *Hegel and the Sciences,* Boston Studies in the Philosophy of science, Vol. 64. Dordrecht: D. Reidel, 1984.

In dec. 1970, Boston University Centre for Philosophy and History of Science together with the Hegel Society of America organized a joint conference on the theme 'Hegel and the Sciences'. Now, fourteen years later, the result of the conference comprising of some of the contributed papers is available to us under the able editorship of Cohen and Wartofsky.

The articles are conveniently grouped under three parts. The first treats Hegel's understanding and 'critique' of the sciences of his period *i.e.*, his philosophy of nature. The second part deals with Hegel's notion of science and its methodology. The third is about the (in)famous Hegelian logic: dialectics and its relation to logic and mathematics of our own time.

Gerd Buchdal's sensitive and sympathetic 'Conceptual Analysis and Scientific Theory in Hegel's Philosophy of Nature' is an attempt to explicate Hegel's relation to some of the physical theories of his time as they dealt with phenomena like gravitation, free fall, matter and force and especially optical ones. Though in no way playing down Hegel's, at times bizarre and incompetent, criticisms of scientific theories, Buchdal succeeds in not belittling the complexity and nuances of Hegel's philosophy of nature. Instead of an arrogant ignoramus who criticized scientific theories without ever reading them, as the received view has it, Hegel who emerges from this article is someone who attempts to "see certain very general scientific concepts articulated within a logical framework, to which they become thereby tied, in order to see how much can be said about a given concept within such a local context". (p. 14–15).

von Engelhardt's article on Hegel's philosophy of nature substantiates this picture by looking at the latter's understanding of the chemistry of his time. About the reproach "that Hegel" showed contempt for empirical study and neglected it" (p. 53), says von Engelhardt, it is simply "indefensible". Where Hegel did criticize the dominant scientific theories of his time, it was born not out of "low esteem for Mathematics, scorn for experimentation and rejection of technology" (ibid.), but out of the belief that an "adequate conceptual grasp and explanation of nature is... only possible for a science that does not deny resting on metaphysical conditions, that does claim to be without presupposi-

tions, but is conscious of its metaphysics, tests it in its empirical work, and orients its experience by it." (p. 52).

In a rather long paper, Henry Paolucci takes up Hegel's discussion of Newton's celestial mechanics. Further, there are papers by Findlay on Hegel's notion of life and views on Biology and by Giovanni on the notion of 'organic' in Hegel. In contradistinction to the earlier papers, Capek attempts to show in his contribution that the limitations of Hegel's thought is not due to the limitations of the sciences of that period, but that "Hegel's philosophy of nature... was far *behind* the sciences of his own time" (p. 109). Hegel's philosophy of Nature, together with the whole of the German Romantic movement, is of significance only because of its 'anti-mechanistic' nature; its vice was one of being a "revolt of imagination and feeling against the depressing mechanistic view of reality" (p. 118). Its virtue was that it was "premature" as an attempt, containing "a few golden grains found after the mass of sand is washed away" (ibid.); von Engelhardt's article on 'Hegel's understanding of Illness', Bubner's 'On Hegel's significance for the social sciences' and Greene's 'Hegel's conception of Psychology' conclude the first part.

The second part opens with Errol Harris' paper on 'The dialectical structure of scientific thinking'. It is a rather disappointing piece despite its promising title. Harris takes up cudgels against those philosophies of science which conceive sciences as "cumulative of empirically derived factual information coupled with merely formal deduction" (p. 212). Against this caricatured bogey man which, like Dame Quickly, is "neither fish nor flesh", Harris pits a history of science looking like this: "The history of science... presents us with a progress which is genuinely continuous, but in which successive main theories relate to each other as opposed and revolutionary, yet at the same time the later sublates *(aufhebt)* the earlier by preserving and transforming significant elements in it. The next succeeding revolution tends to unite these sublated elements so as to resolve the opposition that was most strident in the earlier theories... Newton synthesizes Aristotle and Buridan, Einstein synthesizes Ptolemaic Aristotelianism and Newtonianism." (p. 210) Frankly, I do not think that this kind of vague thinking, loose writing and shoddy scholarship will advance the cause of, assuming the existence of some such thing as, a 'Hegelian philosophy of science'. Quite appropriately, therefore, Ernan McMullin takes Harris' article to task in his 'Is progress of science dialectical ?'. Though McMullin's criticisms are incisive and reasonable, it is to be regretted that he closes the door firmly on the possibility of a research programme in philosophy of sciences inspired by Hegelian/Marxian heritage simply because of the "trouble with the vague term 'dialectical' " (p. 215). It is a pity that he has not taken cognizance of the newly emerging domain of *Non-Classical Logics* which he could have, because his article shows signs of being revised/rewritten sometime after 1978, where both 'dialectic' and "the methodological structure of the argument for the dialectical thesis" (ibid.) are not as vague as McMullin makes them out to be. Of course, the mere existence of varied systems of paraconsistent and dialectical logics do not make a case for a Hegelian project in the philosophy of sciences. But, they do make such a project appear less ridiculous than it otherwise might have been. His conclusion, therefore, is a challenge for those who believe in the usefulness of non-classical logics in actually illuminating and explicating scientific thinking and scientific controversies : "To describe the history of science as a 'dialectical'

process can be a legitimate shorthand way of repudiating the inadequacies of the clssical empiricist account of this history. But as an analytic instrument which could be of service in the complex debates now going on around the exact nature of scientific change, this term seems, finally, to be a very little use." (p. 236).

Herman Ley's contribution about 'Hegel's relation to sciences', Royce Dove's insightful analysis about the relation between *Logic* and *Phenomenology* especially as it pertains to the notion of science in Hegel, takes us to Lloyd Easton's report on the evolution of one of the early Hegelian philosopher of science in the US. *viz.*, J. B. Stallo.

Part three looks into the possibility of formalizing Hegelian dialectics. There is an extended paper by Kosok, a short overview of the possibilities of formalizing dialectics by Gauthier and responses to these two by Sabelli and Soll.

On the whole, the collection is of a rather uneven quality. While some papers give signs of either being rewritten or revised rather recently, other pieces seem to be unaltered versions dating from 1970. Not all the papers included in this volume were presented at the conference : the articles by Ley and von Engelhardt, as the editors inform us, are solicited pieces. Not all the papers presented at the conference are included in this book : glaring by their absence, the editors do not inform us of this, are Putnam's paper on the 'dialectics of nature' and Cohen's piece on the 'structure of scientific consciousness'. The result of this editorial decision makes *Hegel and the Sciences* into a rather strange sort of collection. It is midway between being of some archival value and an initiator of a new project. As a consequence, the book does not and cannot stand on its own. Perhaps, I should briefly explain myself.

As I see it, there are two choices open to the editors who were also the organizers of the 1970 conference. Either this initiative is followed up by further pieces taking up the questions of Hegel's relationship to contemporary discussions in the history and philosophy of sciences, or it is not. If it is not, *Hegel and the Sciences* will be merely of some antiquarian interest to Hegel buffs, or a few historians of philosophy. Most of the articles will not survive the ravages of time except, perhaps, the contributions of Buchdal, Kenley Dove and of von Engelhardt on illness. Those few unblinkered philosophers of science who may be open to looking at the issue with unprejudiced mind, and hence may be drawn to this book because of its title, will soon find their interest rapidly fading away as they browse through this collection. In such a case, *Hegel and the Sciences* will simply sit on some bookshelves, collecting dust and waiting for that dusk when the owl of Minerva will take to its wings.

Alternately, Cohen and Wartofsky see this book as a beginning of a new, interesting phase in the history of philosophy where a grand philosopher of a grand nation gets, at last, to occupy his deserved place. But, for such a thing to happen we need scholars who are not only at home with Hegel but also, this is equally important, with contemporary philosophy of sciences. There is little point in being told, today, that in Hegel 'quantum' means 'quantitative quality' and, as such, differs from 'pure quantity'; or that *'schein'* is a relationship between 'essence' and 'being'. Though it does require a not inconsiderable effort to speak Hegelese, it takes more than that to make Hegel speak to us. The value of such an inquiry may be a moot point; but, some of the authors represented

in this collection place it within the realm of the possible.

If, in other words, *Hegel and the Sciences* is followed up by works capable of formulating Hegel's concerns, problems and proposed solution in terms of and in à language intelligible to philosophers of sciences today, then this book requires to be welcomed into the bookshelves of all philosophers.

My own wish is that the editors will want to choose the latter of the two alternatives. I do hope that the book under review is not just an isolated effort, but will instead inaugurate the long overdue interaction between Hegel and the cotemporary philosophy of science. It is possible, just possible, that the 'cunning of reason' may surprise all of us yet.

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