

*Hegel and the Sciences*. Ed. by Robert S. Cohen and Marx W. Wartofsky. (Boston Studies in the Philosophy of Science; 64). Dordrecht: D. Reidel; Hingham, Mass.: Kluwer, 1984. Pp. ix + 374. \$61.50. ISBN 90-277-0726-X. LC 83-13911.

Two parallel books recently published in the "Boston Studies" series – *Hegel and the Sciences*, edited by the general editors of the series, and *Spinoza and the Sciences*, edited by Marjorie Grene and Debra Nails (Boston Studies in the Philosophy of Science; 91), Dordrecht: D. Reidel; Hingham, Mass.: Kluwer, 1986 – represent an innovative and provocative undertaking. (A third, similar book is announced on Goethe.) One should begin, perhaps, by acknowledging the novelty of these projects. As a result of the "colonization" of the past carried out by historians of philosophy during the past century, whole trends and traditions of the philosophical thought of the last three centuries came to be annexed to one of two opposing fields in contemporary philosophy: idealism versus positivism; and later, continental philosophy versus the analytic tradition. The destinies of both Spinoza and Hegel share a number of features. While Hegel's work was coincident with the founding of the idealist tradition, Spinoza was claimed by this tradition from the outset as one of its forerunners. Although both were willingly left to the idealist camp by its main opponents, they have undergone a less fortunate fate in the hands of the third competitor, the Soviet tradition of *Diamar*: Both were claimed as forerunners of dialectical materialism, the alleged philosophical system of Marx and Engels – Spinoza via eighteenth century French materialism, a few allusions by Marx, and the whole works of Plekhanov and Bukharin, Hegel via the *Dialectics of Nature*.

The origin of the project represented in these two volumes may have been, perhaps, a sense of how much has changed not only within these two broad traditions that have dominated the philosophical arena, but also within the more limited fields of Hegel and Spinoza scholarship. In the last two decades more attention has been paid to Spinoza's interest in physics, optics, and what may be considered remote predecessors of scientific psychology and scientific linguistics. As for Hegel, a renewal of studies primarily in Germany, but with a few ramifications in Italy as well, has given a fresh look at the whole of the Romantic *Naturphilosophie* and Hegel's contributions in particular. In light of such developments, these two parallel undertakings appear to be seminal ones. Unfortunately, however, as far as the Hegel book is concerned, the final result seems to be less exciting than the promise contained in the original project.

The book opens with an introduction by Peter Bertocci, which is focussed for some strange reason on Croce, although Hegel is mentioned from time to time, and which has little to do with the philosophy of science. Of the three sections which follow, the first, on "The Sciences," includes contributions by Henry Paolucci on Hegel, Newton, and Einstein; by John Findlay on Hegel and biology; by Milic Capek on "Hegel and the Organic View of Nature"; by Murray Greene on Hegel and psychology; by Rudiger Bubner on "Hegel's Significance for the Social Sciences"; as well as contributions by Gerd Buchdahl and Dietrich von Engelhardt, which deserve further discussion. The second section, on "Philosophy and Methodology of Science," includes an article on "The Dialectical Structure of Scientific Thinking" by Errol Harris, followed by



a lengthy discussion by Ernan McMullin. Three papers by Herman Ley, Kenley Dove, and Daniel Cook all deal with Hegel's general understanding of science. The section ends with Loyd Easton's paper on the influence of Hegel on J. B. Stallo's philosophy of science. The third and final section, which will be considered in more detail below, is devoted to the relation between dialectics and logic.

The book seems to have undergone a somewhat troubled gestation: Its core is provided by the proceedings of a conference held in 1972, and while "several other" papers are said to have been added, it is unclear whether this includes anything besides the papers by von Engelhardt and Ley (cf. p. vii). With the publication of the book coming twelve years after the conference, the reader is bewildered by a sense of *Ungleichzeitigkeit* among the contributions. Ley's paper was apparently written sometime after the 1973 World Congress of Philosophy at Varna; Findlay's reference to "last June" means June 1969 (p. 87); Gauthier adds to his unrevised paper a postscript, dated November 1978, in which he admits that he has "not been working on the subject for some years" (p. 309); von Engelhardt quotes articles from 1974 as published "after completion of work on this manuscript" (p. 138). As a consequence, one might suspect that the book does not accurately reflect the status of Hegel scholarship in the eighties; such a suspicion turns out to be quite reasonable.

The two most exciting developments in the recent literature on Hegel and the sciences are undoubtedly, on the one hand, the above mentioned re-discovery of Hegel's philosophy of nature, and on the other, the discussion of the relation between dialectics and formal logic, or more specifically, a reappraisal of that relation made possible by work in the field of paraconsistent logics (cf. Diego Marconi, "Contradiction and the Language of Hegel's Dialectic: A Study of the *Science of Logic*, Ph.D. dissertation, University of Pittsburgh, 1980). A third and more inchoate development is represented by a few studies concerning the relation of Hegel to the new science of political economy (cf. Remo Bodei, "Hegel e l'economia politica," in *Hegel e l'economia politica*, ed. by S. Veca, Milano: Mazzotta, 1975). The first of these developments is mirrored in this collection only by Buchdahl's and von Engelhardt's contributions, while several other papers are based on good Hegel philology with too little background in the history and philosophy of science (like Findlay's), or include valuable discussions of contemporary topics in the philosophy of science with only a rather vague connection to Hegel (like McMullin's), or in a few cases (like Dove's), fall into the trap of discussing the word *Wissenschaft* rather than the thing, science – assuming that Kant's and Hegel's use of the former term has no exact correspondence to the English 'science'. That the second development is represented by the whole third section of this collection is certainly one of its chief merits. But the contributions included, when read after 1984, are far from representing the best results of this field of inquiry. The third development is completely ignored, although, since the collection is not entitled *Hegel and the NATURAL Sciences*, and since it does include Bubner's essay on "Hegel's Significance for the Social Sciences," the reader might have expected the social sciences to be covered in as much detail as the natural sciences and logic. Bubner's paper, in contrast to those on Hegel and the natural sciences of his time, deals rather with the presence of a number of Hegelian ideas in later sociological discussion. No other contribution deals with political economy, the only social science (if one



excludes law from that category) whose existence was acknowledged in Hegel's time. A corollary: If the collection was intended also to cover the influence of Hegel's thought on the later development of the sciences, how could it ignore the presence of Hegelian ideas in Marx's critique of political economy?

Having said this much about the structure of the book, it is worthwhile to consider more carefully, first, the reasons why the section on Hegel's logic is unsatisfactory. This requires some awareness of the present state of the debate on logic and dialectics. In 1937 Popper repeated once again a very ancient and respected thesis – the principle of the Pseudo-Scotus – according to which a self-contradictory theory is a trivial one, in which it is possible to prove any statement whatsoever (cf. Karl Popper, "What is Dialectic," *Mind*, 49 [1940]: 403-426; reprinted in *Conjectures and Refutations* [London: Routledge and Kegan Paul, 1969]). It is indeed possible, Popper argued, to build a logical system in which contradictory statements would not imply any statement whatsoever, but such a system would be a very weak one, incapable of preserving most of the familiar inference rules, *modus ponens* included. Popper's problem was solved a few years later by the Polish logician, Jaskowski, who showed that it was possible to build a contradictory, non-trivial, and deductively powerful system (cf. S. Jaskowski, "Rachunek zdania dla systemow dedukcyjnych sprzecznych," *Studia Societatis Scientiarum Torunensis* [1948], Section A, I, 5; Italian translation in *La formalizzazione della dialettica: Hegel, Marx e la logica contemporanea*, ed. by Diego Marconi [Torino: Rosenberg and Seller, 1979]).

Pursuing a related direction of inquiry, another Polish logician, Rogowski, made a decisive contribution to the attempt at formalizing a few fragments of the Hegelian texts (cf. L. S. Rogowski, "Logika kierunkowa a heglowska teza o sprzeczności zmiany," *Studia Societatis Scientiarum Torunensis* [1964], Section A, XV, 2; Italian translation in Marconi, 1979). Prior to this there was only the work of Leo Apostel, "Logique et dialectique chez Hegel" ([1960, unpublished until 1979]; Italian translation in Marconi, 1979) and a few, rather unsatisfactory, discussions of the possibility of the formalization of Hegel's dialectical logic by Gotthard Günther. Rogowski's work was probably, until recently, the best effort of its kind (Marconi, 1979, p. 32); yet it was largely ignored, primarily because of the language barrier. (For a description in English, however, one can now see Marconi, 1980, pp. 29-36.) Of the later, independent attempts at such formalization, Yvon Gauthier's contribution, "Logique hégélienne et formalisation" (*Dialogue* 6 [1967]: 151-165) "is not precise enough in order to be appraised. The formation rules of the language that is introduced, of which only the main ones ... are listed, are heterodox to such an extent as to be incomprehensible without some supplementary explanation, an explanation that is not provided" (Marconi, 1979, p. 76). A real attempt to formalize Hegel's dialectics is made by Michael Kosok, although his contribution is less refined as a whole than Rogowski's and suffers from these shortcomings: first, "the character of a *synthesis* of the negation of the negation is not apparent in the formalization," and further, "the movement of 'reflection' reproduces every conceptual determination in its three aspects which, according to Hegel in the *Phenomenology*, are assumed in general by its analysis ('in-itself', 'for-itself', 'in-itself-for-itself'), but does not grasp the inner transformation undergone by the concept because of the fact of being



assumed in each of the three mentioned aspects" (Marconi, 1979, p. 38). After the mid-sixties, N. C. A. da Costa and his school, following the original suggestions by Jaskowski, developed several "paraconsistent" logical systems. A few more recent contributions, exploring further the technicalities of the formalization of dialectics (cf. Clark Butler, "On the Reducibility of Dialectical to Standard Logic," *The Personalist* 56 [1956]: 414-431) brought that project into connection with the development of paraconsistent logical systems (Marconi, 1980).

We are now in a position to give a closer look at the section in *Hegel and the Sciences* on "Dialectics and Logic," which includes two papers by Gauthier and Kosok, as well as two short discussions by Hector Sabelli and Ivan Soll. The short contribution by Gauthier, the author states, "should be considered as a preface or an introduction to my paper on 'Dialectic Logic and Algebraic Logic,' circulated before the Congress 'Hegel and the Sciences'" (p. 310). That this apparently more substantial paper seems, as far as the reader can discern, to remain unpublished detracts from the value of the contribution included in this volume. After a reaffirmation that "dialectical logic" in the Hegelian sense is, in principle, amenable to a formal treatment" (p. 304), the following few pages of Gauthier's paper are devoted, rather, to showing that there are more promising studies that "the tentative formalizations that have been proposed" (p. 308). Kosok's chapter in the collection includes a presentation of his formalization of dialectics such as it was worked out in his previous paper (cf. Michael Kosok, "The Formalization of Hegel's Dialectical Logic: Its Formal Structure, Logical Interpretation, and Intuitive Foundation," *International Philosophical Quarterly* 6 [1966]: 598-631). He offers in addition a few philosophical considerations on "non-linearity," which is suggested to be a central feature implicit in Hegel's dialectics and one that may prove useful in accounting for the way in which modern science develops – "experiencing and forming identities out of immediacy" (p. 314) or "as a process of formation and transformation in which *all* elements are seen to be elements of transition" (p. 339).

It would not be right to conclude this review without giving special acknowledgment to three of the strongest contributions in the collection. "Conceptual Analysis and Scientific Theory in Hegel's Philosophy of Nature" by Buchdahl is an attempt at viewing Hegel's approach to the sciences of his time and to optics in particular against the background of recent post-empiricist discussion. The paper is rich in information concerning Hegel and based on a clear grasp of the central topics of contemporary epistemology. The Hegelian heritage that Buchdahl wants to rescue is the concept of *Begriffsbestimmung*, or "notional determination." In Buchdahl's words, "the general significance of this procedure amounts to an attempt to see certain very general scientific concepts articulated within a logical framework, to which they become tied, in order to discover how much can be said about a given concept within such a local context" (pp. 14-15). Appreciation of this Hegelian notion is connected with our present understanding of the scientific process; it is not absurd to think that "the broad formative concepts of a science govern its developments, and that a considerable part of their intellectual articulation relates to what we may vaguely call a 'metaphysical dimension'" (p. 15). Hegel's attitude to the empirical sciences may accordingly be restated in more sophisticated terms than the traditional ones of his alleged pan-deductivism. Buch-



dahl claims that the ratio between empirical and metaphysical constraints on the acceptance of theories is, for Hegel too, a matter of degree, and he claims for Hegel's "philosophy of science" faithfulness to the spirit of Kant, who had first established a stratification of criteria (metaphysical, inductive, systemic, and regulative) for the acceptance of scientific theories (p. 19).

"The Chemical System of Substances, Forces and Processes in Hegel's Philosophy of Nature and the Science of his Times" and "Hegel's Philosophical Understanding of Illness," both by von Engelhardt, are two good examples of the German revival of scholarship on the Romantic and the Hegelian philosophies of nature. The first contribution, dealing with chemistry, aims at showing Hegel's familiarity with "the fundamental traits, divergent theories, and essential facts of the chemistry of his time" (p. 53), thus defending Hegel from the traditional charges of having shown contempt for empirical study, low esteem for mathematics, scorn for experimentation, and rejection of technology. The second contribution, dealing with Hegel's philosophy of medicine, aims at placing Hegel within the framework of nineteenth century "romantic" medicine – a movement that has been rather neglected for a long time, though it is far from being a "superseded research program," if one takes into account its association with homeopathy (and also, even if through more mediations, psychoanalysis). Hegel's views are examined in the light of not only their similarity to those of Romanticism, but their differences as well, particularly Hegel's rejection of the romantic idealization of illness. Hegel's philosophy of medicine, like his philosophy of chemistry, is defended by von Engelhardt against the traditional reproach of hostility to empirical research: It by no means "claims to deduce all forms of illness, their causes and courses, the possibilities of treatment ..." (p. 131). In a word, Hegel as a "philosopher of science" is rescued by Buchdahl and von Engelhardt when faced with both the present day philosophy of science and the sciences of his time.

The project from which this book has originated is, in conclusion, a worthwhile one; and one detail of its execution, namely, the choice of devoting a section to dialectics and logic, is laudable. Despite the limitations in carrying out the intentions of this section and the other two, a few of the contributions included in the collection are highly valuable on their own.

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*Christ Unmasked: The Meaning of "The Life of Jesus" in German Politics.* Von Marilyn Chapin Massey. (Studies in Religion Series). Chapel Hill and London: The University of North Carolina Press, 1983. Pp. ix + 182. \$23.00. ISBN 0-8078-1524-1. LC 82-8547.

Die politischen Auseinandersetzungen zwischen Restauration und Reformbewegung im Deutschland der 1830er Jahre sind schon häufig zum Gegenstand gemacht worden, und ebenso die wenig rühmliche Rolle, die die damalige Theologie und Kirche in diesen Auseinandersetzungen gespielt haben. Das Besondere an Marilyn Masseys Darstellung dieses Themenkreises