Book Reviews

RESCHER, N.: Cognitive Systematization: A system-theoretic approach to a coherentist theory of knowledge. Oxford: Basil Blackwell 1979. 211 p. ISBN 0-631-19030-9.

This volume is the first in Rescher's "Pragmatic Epistemology" trilogy which attempts to combine ideas from philosophical pragmatism and systems theory in order to provide new approaches to and insights about traditional problems in epistemology. Whereas the other two volumes of the trilogy will concern scepticism and induction, the present volume aims

> to explore the range of issues relating to cognitive systematization posed by the following group of questions: Why is it important that we should develop our knowledge about the world systematically – what is the point of systematization in the cognitive domain? How does cognitive systematization aid in the pursuit of truth? What are the major modes and methods of cognitive systematization? What considerations legitimate the principles and procedures of cognitive systematization? Does the systematicity of our knowledge have an ontological basis or is it purely an epistemological issue? (p. 1)

In answering these questions Rescher adopts a coherentist neo-Hegelian epistemological approach whose "guiding thought . . . is the idea that systematization is not merely a way of organizing knowledge, but – more fundamentally – a critical standard for determining what it is that we indeed know." (p. 1–2).

Such an enterprise obviously is too ambitious for a 211 page book. Rescher's strategy for avoiding such folly is to write a cohesive and coherent book which draws heavily from a number of other recent works of his – namely his *The Coherence Theory of Truth* (Oxford: The Clarendon Press, 1973), *Methodological Pragmatism* (Oxford: Basil Blackwell, 1977), *Scientific Progress* (Oxford: Basil Blackwell, 1978) and, to a lesser extent, *The Primacy of Practice* (Oxford: Basil Blackwell, 1973), *Scientific Explanation* (New York: Free Press, 1970, *Essays in Modality* (Oxford: Basil Blackwell, 1974), *Plausible Reasoning* (Assen: Van Gorcum, 1976), *Peirce's Philosophy of Science* (Notre Dame: University of Natre Dame Press, 1978), and *The Logic of Inconsistency* (with R. Brandom. Totowa, N.J.: Rowman and Littlefield, 1979). The resulting *Cognitive Systematization* volume is self-contained in the sense that a reader can fully comprehend, and profit from, the volume with no prior familiarity of the other volumes; moreover the book does contain substantial new material, insights, and perspectives, and so it is not a mere digest of the earlier works. Rescher's theses are strikingly original and bold – and, thus likely to be controversial – despite the fact that they fit squarely within the burgeoning epistemological pragmatism revival in philosophy and philosophy of science (as espoused by Quine, Rorty, Shapere, and a growing number of others).

As a philosopher of science my instinct in reviewing (or reading) a book is to accurately summarize its argument, and then critically assess its adequacies, pointing out what I perceive as its strengths but also providing close criticism of its philosophical inadequacies. This strategy is impossible for the present review. For if one wishes to critically assess Rescher's views on issues of cognitive systematization the book is not at all self-contained. Substantial portions of a number of his chapters draw from, and depend for detailed developments on, others of his books. To get the full, official development of his position in *Cognitive Systematization* one would have to consult at least the nine other prior books of his identified above and integrate the developments there with those in the present volume – all as a preface to a responsible philosophical critique. Although I cannot do that here, I do think Rescher's insights and ideas are sufficiently penetrating to make such an enterprise highly rewarding. Moreover the need for such effort is not a defect or shortcoming of Rescher's. For the issues he is tackling are so complex and intertwined that adequate treatment of them requires either the production of so many interconnected volumes or else a massive single volume of unaffordable price, ponderous length, and unliftable weight. Rescher's multiple volume strategy for developing and presenting his ideas is a sound one which has the advantage over the *Magnum Opus* approach of making his ideas on *aspects* of his larger theory accessible and valuable to interested non-philosopher professionals – such as the readers of this journal – who would find wading through everything an unproductive use of time.

In the remainder of this review I will present a summary of what Rescher presents in *Cognitive Systematization* and then conclude with a discussion of its relevance to readers of this journal.

After a brief "Introduction," Chapter I presents a most fascinating history of the systems concept. In this Rescher traces the underlying idea of a "system" to classic antiquity, and its subsequent developments in the Renaissance, the 17th and 18th centuries, and into modern times. The dualism between intellectual and physical systems is stressed, as are the central roles of systematicity in science. A crucial claim is that "Systematicity serves as a *regulative ideal* of cognitive development and represents the very hallmark of a science." (p. 3, italics added). Chapter II argues that cognitive systematization has three aims in the factual (hence scientific) domain: (a) providing a vehicle for intelligibility and understandability, (b) providing the required means for authenticating a body of knowledge claims as scientific, and (c) providing a testing standard for the acceptability of knowledge claims. The latter leads to what Rescher terms "The Hegelian Inversion." Whereas traditional views were that science should first determine truths then systematize them, the inversion is that "systematizability is transmuted into a *standard of truth*" – that the claim of system is the arbiter of fact (p. 34). Rescher's championing of the Hegelian Inversion rests on his belief that "there is no prospect of assessing the truth – or presumptive truth – of claims . . . independently of our efforts at systematization in scientific inquiry." (p. 35) The conclusion of the chapter is "if *adequately* systematized, then *presumably* true . . . if *fully* systematized, then *certainly* true and conversely." (p. 38)

The remainder of the book is concerned with exploring what adequate and full systematization consist in, and tracing the implications of such an approach.

Chapter III pits the traditional epistemological approach to systematization, *foundationalism,* against *coherentism.* The former is an Euclidean model wherein basic knowledge is organized, exploited, and expanded in a hierarchical linear deductive manner, whereas the latter employs a network model of cyclic systematization.

> This network model sees a cognitive system as a family of interrelated theses, not necessarily arranged in a *hierarchical* arrangement (as with an axiomatic system), but rather linked among one another by an *interlacing network* of connections. These interconnections are *inferential* in nature, but not necessarily *deductive* (since the providing of "good explanatory accounts" rather than "logically conclusive grounds" is ultimately involved). (p. 44)

He argues for the superiority of the network model of coherentism on grounds of its cyclical, non-linear modes of justifying the network organization, which involves the network capacity for alteration of its portions without destroying the whole, and various epistemological advantages over foundationalism. Chapter IV adds to the arguments in favor of coherentism (in ways that attempt to exploit the Gödel incompleteness theorems) with the claim that on the hierarchical foundationalism approach the complexity of systematization afforded is denumerable, whereas on the coherentist network approach a non-denumerably infinite complexity of systematization is possible. Chapter V continues the championing of the coherentist analysis over foundationalism by explaining the roles of plausibility and presumption principles in a "best-fit" analysis coherentist approach to cognitive systematization. Chapter VI attemtps to show the superior fashion in which "coherentism accomodates the standard methodology of scientific inference and inductive reasoning by using the parameters of systematizability as principles of plausibility assessment." (p. 82)

Despite all the virtues Rescher sees for the coherentist approach, there is one stock objection he must dispel – viz., that coherence theories of truth are circular and thus incapable of capturing objective truth. Chapter VII attempts to define this criticism. The argument is complex, but ultimately depends heavily on key features of Rescher's own brand of coherentism wherein cognitive networks interact with the real world in a cyclic, evolutionary fashion that "provides a theory-external reality principle that leads outside the problematic cycle of self-substantiation [i.e., vicious circularity]" (p. 90). *Inter alia* he defends the view that it is legitimate "to validate induction as a mode of coherentist systematization" (pp. 90–91) – with no vicious circularities involved. The theoretical controls of self correctiveness and self-substantiation play a central role, and the underlying idea is that a feedback mechanism wherein the network must self-adjust in response to environmental stimuli not under its control enables avoiding vicious circularity.

Having defended his coherentist analysis of systematicity, Rescher denotes the remainder of the book to exploring its status and various of its implications. Chapter VIII argues that the status of

> systematicity is a regulative ideal of inquiry – a *methodological* committment which certainly does not prejudge, let alone preempt, any substantial part of the question of the systematicity of nature on the ontological side. Its legitimation as a *valid* ideal is accordingly teleological – it lies in the methodological efficacy of the pursuit of system in facilitating the efficient realization of goals of inquiry. (p. 115)

In so doing, clear distinctions are made between cognitive and non-cognitive (or ontological) systematicity, and the relationships between the two are explored. The next three chapters explore the "Limits to Cognitive Systematization," being concerned to explore what factors might make systematization of our factual world impossible. Chapter IX explores the prospect that systematization is impossible because our knowledge is essentially incompatible; developments from erotetic logic play a central role. Chapters X and XI respectively explore the prospects that explanatory incompleteness or inconsistency might preclude systematization. It is argued that none of these three factors, properly understood, constitute a threat to systematizability on Rescher's coherentist account.

The final chapter, "Cognitive Metasystematics: The Morphology of Knowledge Systems," should be of especial interest to readers of this journal. For these Rescher exploits the developments of the previous chapters, bringing them to bear on central issues of classification. His own chapter synopsis summarizes things well, although it masks the richness of his discussion:

> (1) Cognitive systems can themselves be related systematically, which gives rise to the enterprise of cognitive metasystematics. (2) the classificatory taxonomics of our knowledge systems appears as a focal aspects of this enterprise. (3) The distinction between *classifying* sciences and *evaluating* them is examined. Despite the long tradition of linking these two activities they can – and should – be separated. (4) The hierarchical ordering of successive system-inclusions represents a particularly prominant mode of cognitive taxonomy. (5) Taxonomic proliferation is a characteristic facet of scientific progress. (6) Despite its prominence here, *hierarchical ordering is insufficient for the needs of the taxonomy of science. The overall taxonomic structure of natural science is not that of a hierarchy but that of a chain-mail network interlinkage.* (7) The history of science exhibits not only taxonomic *proliferation* but taxonomic *complexification* as well. The historical trend of growing complexity: linear order to hierarchy to network. (8) What explains taxonomic complexification? The answer lies in our ongoing discovery of the complexity of nature itself, rather than in homocentric considerations relating to the *practice* of scientific research. (9) The issue of morphological eschatology: Must the morphological evolution of science come to a stop? There seems to be no cogent reason for insisting it must. (10) This fact, however, does not mean that the unity of science is endangered. (p. 180; some italics added.)

The intimate connections between the rejection of hierarchical classification schemes here and the earlier championing of the network model over the Euclidean approach to systematization deserves emphasis.

Cognitive Systematization offers little to those classifiers whose interests are on the "how to" of uncritically applying pre-existing classification schemes to real collections or populations. Those readers concerned with weighing the various merits of different taxonomic approaches will find some limited benefit from the volume in that it does point out serious theoretical limitations to such conventional classification approaches as hierarchical organization. Two other short of readers will profit far more from the book. (1) Those classificationists strongly interested in the epistemological aspects, and ramifications, of classification schemes and approaches will find the volume extremely insightful and challenging. (2) Readers interested in interfacing classification with the data-base searching techniques of artificial intelligence and related adaptive information approaches will find *Cognitive Systematization* gives an excellent theoretical basis for such efforts – especially where Rescher

argues for the inadequacy of hierarchical classification schemes and for the superiority of cyclical, self-adjusting networks. For these latter two groups of readers, the book is a "must read."

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ELLEN, R.F. and REASON, D. (Eds.): **Classifications in their Social Context**. London: Academic Press. 1979.

Classifications in their social context is a collection of papers presented at a two-day seminar on "Systems of Classification and the Anthropology of Knowledge", held at the University of Kent at Canterbury in June 1977. (One paper, published elsewhere, was omitted, and another, Bulmer, was added.) The purpose of the seminar was to address the following questions: "What is the logic of classification? What are its material, social and psychological determinants, correlates and corollaries? How, empirically, are "classifications" to be identified, elicited and described? How, theoretically, may they be compared and elucidated?" (Preface, p. vii). The data presented were drawn predominantly from studies of folk classification and scientific taxonomy, and were intended to raise issues relating to the universality and necessity of classification as a conceptual order for the comprehension of "the world" (p. viii).

According to Ellen's introductory essay, classification itself became a legitimate object of philosophical and ethnographic study in 1901–1902 with the publication of Durkheim and Mauss' "De quelques formes primitives de classification". The essay traces the debate between the "social constructionists", followers of the Durkheimian tradition, and the American ethnoscientists, and highlights the need for a metatheory to deal with the different approaches. Ellen views classifications as "discursive practices situated in a given social matrix and general configuration of knowledge and ideas . . . and . . . products of specific histories" (p. 17). The aim of research is to answer the question, "How far can we really predict that particular kinds of societies and ideologies will give us particular kinds of classification systems?" (p. 26). To this end, Ellen proposes the following set of variables for the description of individual classifications: variability; arbitrariness; expression of inclusiveness; anomaly; structural complexity; terminology, nomenclature and taxonomy; and integration in semantic fields. "A marriage between the formal (ethnoscientific) and the sociological approaches" is needed, he maintains, in which empirical generalizations and phenomenological descriptions of classifications are supplemented by studies of underlying mechanisms. This is precisely what the seminar papers are intended to provide.

Chapter 2 presents data from the natural classification of the Rangi of Tanzania, speakers of a Bantu language. The author, John D. Kesby, who lived among the Rangi from 1963 to 1966, attempts to support a Rangi view of the universe in which living creatures are first divided between immobile (plants) and mobile (animals). The former category contains two classes distinguished on the basis of size and/or woodiness; the latter has three classes: *ndee* (birds and bats), *"vanyama"* (mammals, except bats and people) and *makoki* ("creeping things"). This classification is attributed to a "three-tiered" view of the universe which is claimed to occur "in all the major cultural regions of the world" (p. 41), namely, a division of events and objects into those of the sky (above), those of here, where people are (here), and those more lowly than people (below/water). In order to support this tripartite division, Kesby presents convincing cultural, geographical and historical evidence that the category *samaki* 'fish' belonged originally to the category *makoki*. In other places, however, the argument is flawed by self-contradiction and premature conclusions which are not adequately supported by the Rangi evidence presented. The analysis is based on "some five hundred terms", although the author stresses that there are "probably many more" (pp. 52–53). Explicit reference is made to the pioneering research of Brent Berlin in folk classification; and indeed, some of the evidence supports Berlin's findings (e.g., the existence of implicit, unnamed categories, and the prominent role of perceptual attributes – size, shape and color – in classification). On the other hand, Kesby stresses the differences between scientific biological taxonomy and vernacular folk classifications, whereas Berlin and his associates had stressed the resemblances: In containing two, or at most three levels, says Kesby, the latter "differ from post-Linnaean naturalists . . . but they resemble all other groups of people whose classifications have been even partially investigated" (p. 53); "implicitly . . . Rangi do subdivide the major categories and group the categories within them; but this does not alter the essentially two-tier arrangement, since the process is implicit and there are no terms to denote the groups so formed" (p. 43). The extent to which this is true remains a controversial issue, but nonetheless the chapter remains a very interesting and well-constructed exercise in explanation.

Ralph Bulmer's chapter on the Kalam (New Guinea) classification of birds is a sequel to his 1978 paper "Totems and taxonomy", in which, following Radcliffe-Brown, he attempts to demonstrate that those creatures with particular salience in the everyday folk classification are also those which are embued with mystical significance. The present paper is a reply to two criticisms of the first paper: circularity in the exposition of the connection between ritual marking and taxonomic status; and subjectivity of judgments of taxonomic salience. The greater part of the paper is a response to the second criticism, using the data on birds collected by Ian Saem Majnep, a long-term Kalam assistant. Through a careful "-emic" analysis of the general classification of birds, using the notions of covert categories, natural taxonomy ("the grouping of phenomena in terms of degrees of general similarity based on multiple criteria" – p. 63) and Kalam cultural patterns of thinking, Bulmer attributes general taxonomic salience to birds of taxonomically-defined natural groups, or culturally-defined "unnatural" groups, exhibiting one or a combination of factors including size, plumage, habitat, feeding habits, and manner of interaction with man. These same species appear to account for "nearly all" the birds of ritual significance. The author illustrates the interplay of these factors using the work of his trained Kalam assistent in ordering the chapters for an ornithological monograph; but the author himself admits the