
The Epistemology of the Clinic

A Review of *Reasoning in Medicine*

By Daniel Albert, Ronald Munson, and Michael Resnik

by McKee Lee

I

Philosophy is often divided into four main core areas: metaphysics, epistemology (or theory of knowledge), ethics, and logic. The division is not neat, of course. Problems and solutions in each area generally have analogues in other areas. In addition, there are the various philosophies of this and that, such as philosophy of science or philosophy of art, which address metaphysical, epistemological, ethical, and logical questions within the context of some particular domain of human activity.

What does philosophy have to offer health care professionals? There is plenty of evidence that ethics makes a significant contribution; the close and growing cooperation between ethicists trained in philosophy and health care professionals — and for that matter the existence and usefulness of journals such as this one — attests to that. But what can health care professionals learn specifically from logic, metaphysics, or epistemology that will help them do their jobs? In other words, is the philosophy of medicine more than just a branch of applied ethics?

In a recent book, two philosophers and a physician convincingly demonstrate that it is. *Reasoning in Medicine: An Introduction to Clinical Inference* (Johns Hopkins University Press, 1988) by Daniel Albert, Ronald Munson, and Michael Resnik, is as sweeping in scope as the title suggests. This volume is intended to be a contribution to clinical education as well as to general knowledge, but the authors' ambitions do not stop there. In the final chapter they say, "It does not seem too much to hope that the broadened perspective on clinical medicine that we have presented in the earlier chapters will pay off in terms of better patient care." (1) The highest praise this reviewer can pay — speaking

modestly, as a non-clinician — is that their hope seems justified.

In the second chapter, the authors present a fictional but realistic case study. Mrs. Halprin is the patient. The central medical personnel are Dr. Julie Barton, a second year resident at a teaching hospital in Boston; Charles Covici, a third year medical student; and Dr. Harold Williams, a senior member of the hospital staff and an associate professor of medicine at the affiliated university. The course of Mrs. Halprin's illness is followed from her admission to the hospital through the diagnostic pro-

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cess (it turns out that she suffers from systemic lupus erythematosus) and the course of treatment, to her death some months later (of cryptococcal meningitis). Subsequent chapters use this case as a basis for discussing the role of inference in a clinical setting.

Reliable inference depends on adequate data, and the authors devote a chapter to showing how diagnostically relevant data may be gleaned from the clinical encounter, laboratory investigation, and empirical studies. Subsequent chapters explore inductive and deductive inference; hypotheses, laws, and theories; the concept of disease; models of diagnosis; and decision theory as applied to patient management. The final chapter evaluates the performance of the medical personnel in the hypothetical case study in terms of the concepts and principles developed in previous chapters. (The evaluation is not entirely positive: the authors identify mistakes both of omission and commission and

errors of reasoning in the diagnosis and treatment of Mrs. Halprin.) This bare catalogue of general topics cannot begin to suggest the richness of the book.

Among other extremely useful features are the lists of recommended reading at the end of each chapter. Those who wish to explore further any of the topics discussed here will find ample guidance. Some key works, such as A.R. Feinstein's *Clinical Judgment* and Edmond A. Murphy's *The Logic of Medicine*, are listed in more than one of the chapter bibliographies.

The authors do not underestimate the intelligence of their readers. The book requires careful reading, but the authors have succeeded in their goal of avoiding "both jargon and unnecessary technical language." Necessary technical terms which might not be familiar to the intended primary audience of physicians and physicians in training, are adequately explained when introduced.

Any health care professional who might want a crash course in logic and the philosophy of science could not do better than to read this book. But throughout, the issues, concepts, and principles are presented in a way that is geared to clinical experience. Philosophical issues that do not have immediate relevance to clinical judgment and practice (e.g. the problem of justifying inductive inference, or the strengths and weaknesses of Thomas Kuhn's analysis of scientific revolutions) are briefly sketched in their appropriate context, but the reader is never long distracted from the concrete clinical applications of the material being presented.

When they do discuss general philosophical issues and positions, the authors occasionally seem to expect resistance from some of their readers. They take great pains to explain the ultimate practical importance that a philosophical understanding of the scientific enterprise can provide for clinicians:

It seems appropriate to end this

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chapter by raising the question 'What does all this philosophy of science have to do with Mrs. Halprin and with clinical medicine?' The nonintellectual answer is that it has nothing to do with either. It is quite possible to practice medicine on the basis of empirical rules and procedures that ignore both medicine's scientific component and its conceptual background. This is the sort of 'cookbook' medicine characteristic of ill-educated practitioners during the last century. . . . To give this answer is to ignore the fact that medicine is an intellectual discipline as well as a practical art or skill. . . . Because this is so, an understanding of the character of medicine requires an understanding of the character of science. . . . Failure to see that Mrs. Halprin is at the focal point of an immensely complicated conceptual and scientific process is failure to grasp the character of contemporary medicine. (2)

Is the philosophy of medicine more than just a branch of applied ethics?

In other places as well the authors attempt to justify the claim that philosophical theory is relevant to their readers' clinical practice. "At first it may seem that discussing the disease concept in medicine is a pointless or impractical undertaking," they say in the chapter section subheaded "Why Bother with the Disease Concept?" (3) I find extremely persuasive their defense of the relevance of the issues they discuss to clinical practice; but let the clinicians decide.

Albert, Munson and Resnik are careful to let us know when they are summarizing established material, when they think they are successfully synthesizing incomplete but partially correct views, and when they think they are exploring new territory. The lucid and concise explanation of the inverse probability law and its more complicated cousin (Bayes' theorem), and their role in reasoning from symptoms to diagnosis, is an example of expert summary of established

material. Another is the exposition of decision theory in Chapter 9. The surveys of competing concepts of probability (Ch. 4) and of disease (Ch. 7), and of stereotypical conceptions of the diagnostic process (Ch. 8), are examples of their ability to criticize the weaknesses and synthesize the strengths of previous investigations of their topics. The presentation in Chapter 9 of an analytic framework for group decision making (so unavoidable in a clinical setting) exemplifies the authors' willingness to argue for a new approach where no consensus exists. Their conclusions on each of these topics deserve, and will receive, more extensive discussion than is possible here.

Throughout, the authors try to combat what they take to be mistakes, misconceptions, or mystiques which infect clinicians' thinking about what they do. For instance, they argue persuasively in Chapter 3 against the impression held by many clinicians that laboratory data are inherently more "objective" and trustworthy than data derived from patient interviews, which are "subjective" and untrustworthy.

But their primary target is the mystique of the great clinician:

In the view of most physicians, the reasoning processes in clinical medicine contain a somewhat mysterious and inexplicable component. Clinical reasoning is seen as something that goes beyond rules and rubrics, protocols and algorithms. It is taken to involve elements of intuition and creativity that cannot be replaced by explicit or 'mechanistic' processes. . . . The great diagnostician who draws upon years of experience and vast resources of knowledge to make correct pronouncements on puzzling cases has become virtually a cult figure within clinical medicine. He or she serves as an emblem of possibility and represents for other clinicians the combination of traits that all must admire. . . . The notion that medicine is an art as well as a science underlies the traditional endorsement of the need to teach clinical medicine by example, rather than from abstract principle alone. (4)

The authors do not attempt to dispel or debunk this mystique so much as to get behind it. They do not deny there is something special about the great clinician that cannot be fully captured by any representation of his reasoning in terms of formal systems; but they are convinced that the great clinician's reasoning is a lot less mysterious than

prevailing myth would suggest.

The analysis of clinical reasoning is not an all-or-nothing process. The alternatives are not logical formalism on one side and pure intuition on the other. We follow a middle road. We show that there are guiding principles of inference that can anchor clinical reasoning and that observing these principles will help to improve the care of patients. (5)

As this passage indicates, the authors are cautious. They go a long way toward disarming the criticism that they claim too much for the power of formal analysis to illuminate clinical reasoning. With scrupulous honesty they point out the limits of computer programs for diagnosis, decision theory in patient management, and so on. They seem confident, with respect to some problems, that these limits can be pushed back considerably by future research; but they frankly acknowledge that formidable difficulties both theoretical and practical are likely to remain in the foreseeable future.

The discussion of decision theory is a good example both of their optimism and of their honest caution. The authors seem very fond of decision theory. (One of them has written an important book on the subject. [6]). They argue convincingly that it can be useful in the clinic, yet they also recognize problems. The inputs necessary for a formal analysis of a decision situation include both the probabilities of various states occurring, and also the values (or utilities) of possible outcomes. There are difficulties with both. The authors present a lucid summary of the breakthrough achieved by von Neumann and Morgenstern in quantifying how interested parties attach values to possible outcomes of a deci-

An understanding of the character of medicine requires an understanding of the character of science.

sion. (7) But when, as typically occurs in the clinic, we must consider the values of several different parties whose

preferences may not agree, complications abound. The authors acknowledge the importance of current work in medical ethics in dealing with these complications, which are currently beyond the scope of purely formal analysis.

Despite the limits of decision theory (and the authors mention many that I have not) they are convinced of its

The great clinician exhibits the Aristotelian virtue of practical wisdom.

usefulness: "... Even trying to use decision theory usually illuminates a decision problem. . . Learning that we are not in a position to apply the theory can be useful in and of itself. At the very least, decision analysis forces us to consider issues and options we might easily overlook or ignore. It keeps us honest and makes us perspicuous." (8) But in the current state of clinical applications, "we believe that formal decision analysis is relegated to a role in policy making" where the time constraints of patient care are not so pressing. (9)

Despite the authors' caution in the claims they make for formal analysis, and their repeated forthright acknowledgement that art, intuition and experienced clinical judgment play a role that such analysis cannot capture, they do occasionally, in their enthusiasm for bringing to light the principles that guide clinical inference, go a bit too far. Here is an example:

"This general analysis of prediction is intended to hold only for what are sometimes called *rationally grounded* predictions. That is, the analysis is limited to predictions that are justified by laws and theories." (10) Among the predictions the authors rule out of the "rationally grounded" class are any offered "only as a guess or a hunch or on the basis of unanalyzed and unarticulated 'experience'"— though it is admitted that medical practitioners must often make do with these. But also apparently ruled out are the "subjective probability estimates" of physicians such as the fic-

titious master diagnostician Dr. Williams, who "thought Mrs. Halprin had lupus before he received the lab data that clinched the diagnosis." "Clinical experience and clinical judgment often serve as a basis for prediction," say the authors, the context implying that such predictions do not count as rationally grounded.

It seems to me that Dr. Williams' experienced and talented diagnostic judgment, even prior to clinching confirmation, can be regarded as *not* rationally grounded only if one has a fairly impoverished sense of rational grounding. It appears that the authors' real conception of rational grounding is far more restrictive than their officially stated one, for surely Dr. Williams' tentative diagnosis is, in some sense, "justified by laws and theories." His commitment to certain laws and theories is a crucial determinant of his diagnosis. But prior to clinching confirmation, his prediction that Mrs. Halprin had lupus may not have been subsumable under either the nomological-deductive or the nomological-statistical explanatory models presented by the authors; and such subsumability, it seems, is what the authors really mean by a prediction's being rationally grounded. Later in this essay, I will mention a theoretical perspective which might justify the claim that Williams' judgment is rationally grounded, although not subsumable under either explanatory model.

II

Let me depart briefly from consideration of the book under review to return to the more general question with which I began: Whether philosophical theory of knowledge has anything to offer health care professionals. I think that it does, in ways that go beyond the range of Albert, Munson and Resnik's fine book. It is impossible adequately to substantiate this claim within the scope of this essay, but a brief survey of the field may indicate which issues and positions might be of interest to physicians and health care professionals.

The predominant concerns of epistemology in the last few decades have been traditional ones: analysis of the concepts of knowledge and justification, and responses to skeptical challenges against the very possibility of knowledge or justification.

Philosophical analysis of key concepts has taken some important turns in recent years. One significant trend has been the growing interaction between epistemology and disciplines such as

psychology, linguistics, anthropology, neuroscience, and the study of artificial intelligence. [These are the components of "cognitive science." (11)] Discussions of how we attain justified belief have increasingly focused on the nature of reliable (i.e. truth-conducive) belief-forming processes, relying extensively on the data and hypotheses of empirical psychology. (12) Extreme proponents of "naturalized" epistemology have even suggested that whatever is legitimate in traditional philosophical investigations of knowledge can be wholly absorbed by psychology, although this remains a minority position (and in my view an incorrect one). (13) Virtually all epistemologists agree that the findings of descriptive psychology are strongly relevant to philosophical theory of knowledge.

There is a great deal in this recent interdisciplinary study of mind that should be of interest to clinicians. After all, both clinicians and their patients have minds, and an understanding of how they function or malfunction is not only a

Areas of philosophy outside ethics can contribute to the professional self-knowledge of physicians.

theoretical matter. For instance, the study of bias in memory is potentially useful to clinicians who must rely largely on patient interviews for data.

Another traditional concern of epistemology, still prominent in contemporary discussion, is the challenge of skepticism. There are interesting historical links between philosophical skepticism and medical practice. Sextus Empiricus, one of the most influential ancient skeptics, was a physician, and the connection between his profession and his philosophy has been a topic for speculation. Edmond A. Murphy has explored the relevance of skepticism to medicine in a fascinating book entitled *Skepsis, Dogma and Belief: Uses and Abuses in Medicine*.

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Developments in epistemology often parallel those in ethics. One recent accent in both fields is a revival of interest in the concept of virtue, and in detailed analysis of particular virtues. For a long time, moral philosophy focused on rules and principles. Its central task was to identify and elucidate the underlying principles of morality (e.g. Kant's categorical imperative or Mill's principle of utility). Recently, however, a tradition stemming from Aristotle that emphasizes character traits has made a comeback. In epistemology, those trying to analyze justification had been concentrating on logical relations among propositions: one's belief in a proposition was justified if that proposition had the right sort of relation to other justified propositions. But some epistemologists have begun exploring the idea that a justified belief is one whose acquisition involves the display of intellectual (or "epistemic") virtue.

As in the moral realm, so too in the intellectual or epistemic, Aristotle is the pioneer in discussing the virtues. The most important and enigmatic of the Aristotelian virtues, crucial both to the moral and the intellectual sides of the well-lived human life, is *phronesis* — usually translated "practical wisdom." One important element of this virtue is the ability to grasp the exigencies of particular situations, an ability that cannot be reduced to rules or subsumed under formal models. And here we return to an omission (it cannot be called a defect, for no book can do everything) in the excellent book by Albert, Munson and Resnik. Probably it should not even be called an omission, since the authors are careful to do justice to the intuitive aspect of clinical practice, while trying to counter its mythic exaggerations. The great clinician exhibits some of the salient features of the Aristotelian person of practical wisdom. Dr. Williams' diagnosis of Mrs. Halprin, even before it is clinched by lab data, is rational in the fairly strong sense that it manifests important intellectual virtues.

Another aspect of the rediscovery of the virtues in both ethics and epistemology is the recognition of the importance of exemplars in moral and intellectual development. Paradigmatic individuals contribute at least as much to moral and intellectual growth as does the mastery of rules and formal systems. Albert, Munson and Resnik may, in their dogged demystification, underestimate the practical importance in clinical education of the mystique of the great clinician. It is entirely appropriate that

the great clinician "serves as an emblem of possibility and represents for other clinicians the combination of traits that all must admire" (14)

Acknowledging this is perfectly consistent with recognizing the characteristic patterns and processes of reasoning involved in clinical inference. Sherlock Holmes (like the great clinician on whom Conan Doyle modelled him) could always explain the rigorous reasoning that led him to his startling conclusions, and in such a way that it seemed obvious in retrospect. But this only enhanced, rather than diminished, the undeniable fact that the man had mystique.

I conclude that areas of philosophy other than ethics do contribute to the professional self-knowledge of physicians; and because self-knowledge is the key to self-improvement, philosophy is ultimately of some practical importance.

1. *Reasoning in Medicine* (hereafter "RM"), p. 244.
2. RM, 147-8.
3. RM, 150.
4. RM, 1.
5. RM, 5.
6. Michael D. Resnik, *Choices* (Minneapolis: University of Minnesota Press, 1987).
7. RM, 222-225; the pioneering work by J. Von Neumann and O. Morgenstern is *Theory of Games and Economic Behavior* (Princeton, N.J.: Princeton University Press, 1944).
8. RM, 234-5.
9. RM, 253.
10. RM, 125.
11. For an account of the evolution of cognitive science that does full justice to the contributions of philosophy, see Howard Gardner, *The Mind's New Science* (New York: Basic Books, 1987).
12. The outstanding recent work along these lines is Alvin I. Goldman, *Epistemology and Cognition* (Cambridge: Harvard University Press, 1986).
13. A good recent anthology, including essays by W. V. O. Quine, is Hilary Kornblith (ed.), *Naturalizing Epistemology* (Cambridge: The MIT Press, 1985).
14. RM, 1.

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