CORRESPONDENT'S REPORT

Recent Work in Philosophy II

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I mentioned in the first of these columns that I was attempting to excite some interest in the Frame Problem among philosophers (since I think it is a philosophical problem—not 'just' a problem of engineering or computer science). It is too early for my efforts to have born fruit in the form of published pieces, but there are some stirrings, which I will report on as soon as I can cite chapter and verse—supposing of course that they turn out to be worth reading. My attempt to advertise the Frame Problem includes a paper, "Cognitive Wheels: the Frame Problem of AI", which is forthcoming in a volume edited by Christopher Hookway, *Minds, Machines and Evolution*, Cambridge University Press, 1984. There are other papers by philosophers dealing with AI in that volume.

There are a few philosophers who have learned LISP and begun trying their hand at serious AI programs. One is Robert Cummins, whose new book, *The Nature of Psychological Explanation* (Bradford Books/MIT Press, 1983), covers familiar ground in the "philosophical foundations of cognitive science"—the nature of mental representation, the logic of functional explanation, the problem of intentionality—but from a more realistic and detailed standpoint than previous philosophical work. Under Cummins' patient examination, many of the ideological slogans of cognitive science evaporate. This is certainly useful for philosophers, the primary intended audience for the book, and I suspect many of those working in the trenches will similarly benefit from this clearing away of smoke and mist.

I will not ordinarily report here on current work in logic—because I am no logician and don't myself keep up with the field. Besides, my impression is that the flow of information from formal logic to AI is not in need of my help, even if I could offer it. But here is an exception: just in case it hasn't penetrated to all corners of AI, I commend Nuel Belnap's work on relevance logic and

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related topics. For starters, see his "How a Computer should Think" in G. Ryle, ed., *Contemporary Aspects of Philosophy*, Oriel Press, 1977, pp. 30–55; and N. Belnap and M. Dunn, "Entailment and the Disjunctive Syllogism", in *Contemporary Philosophy. A New Survey*, Vol. 1, Martinus Nijhoff, the Hague, 1981, pp. 337–366. Another piece that I *think* might be useful to people in AI is Carlos Alchourron and David Makinson, "Hierarchies of Regulations and their Logic", in R. Hilpinen, ed., *Studies in Deontic Logic*, Reidel, Dordrecht, 1980.

If any field in philosophy ought to be useful to AI, it should be epistemology, but until very recently, I think, it has been almost entirely preoccupied with artifactual problems that arise only under radically idealized conditions: perfectly rational knowers with indefinitely extensive (and accessible) memories, with eternity on their hands and nothing better to do than sit around avoiding error. A particularly fine antidote to that lamentable tradition is Lawrence Powers, "Knowledge by Deduction", *Philosophical Review*, 1978, pp. 337–372.

The times are changing; epistemology is becoming 'naturalized'—see Quine's well-known essay, "Epistemology Naturalized", in his *Ontological Relativity & Other Essays*, Columbia, New York, 1969, pp. 69–91. This naturalization has taken several healthy directions:

(1) A general tendency to pay closer attention to the actual epistemological problems that arise in the real world (of science, primarily), and to the ways we actually tend to resolve them. See, for instance, Clark Glymour's *Theory and Evidence*, Princeton University Press, 1980.

(2) A recognition of the importance of making one's normative epistemology mesh with the hard facts (as they begin to trickle in) of human cognitive psychology. See, for instance, Alvin Goldman, "Epistemics: the Regulative Theory of Cognition", *J. Philosophy*, 1978; Christopher Cherniak, "Feasible Inferences", *Philosophy of Science*, 1981, pp. 248–268, and "Rationality and the Structure of Human Memory", *Synthese*, November 1983.

(3) "Evolutionary epistemology". The term is due to Donald Campbell, "Evolutionary Epistemology", in P.A. Schilpp, ed., *The Philosophy of Karl Popper*, LaSalle, 1974, but has now been broadened to include quite a broad spectrum of work by philosophers (and a few biologists and psychologists) who think that asking evolutionary questions about our cognitive capacities is essential to understanding their powers, their limits, their modes of operation. One that strikes me as potentially particularly illuminating to people in AI is William Wimsatt's "Randomness and Perceived Randomness in Evolutionary Biology", in *Synthese*, 1980, pp. 287–332. I dip my own oar into this water in "Intentional Systems in Cognitive Ethology: the 'Panglossian Paradigm' Defended", in *Behavioral and Brain Sciences*, September 1983, pp. 343–390. There are several good books and articles in preparation in this area. One in particular is Ruth Garrett Millikan, *Language, Thought and Other Biological Categories*, forthcoming from Bradford Books/MIT Press. I will report on others as they become available.

It is often bruited about by philosophers that people in AI are lamentably ignorant of the great works on the mind by the Phenomenologists: Husserl, Merleau-Ponty, Heidegger and others. But how is the well-Intentioned AInik to remedy this with anything less than four years of graduate work? The works of these authors are as far from self-explanatory as anything ever written. Now there is at least a candidate way out: Hubert Dreyfus has edited, "in collaboration with Harrison Hall" (whatever that means), a collection, *Husserl, Intentionality and Cognitive Science*, Bradford/MIT Press, 1982. This book is supposed to show how Husserl and the other Phenomenologists foreshadow cognitive science, how Husserl's inscrutable *noemata* are just Minsky's *frames* without a computer (just think what Minsky's frames would be *with* a computer!), and how Heidegger's defeat of Husserl was a preview of John Searle's triumph over AI. (An essay by Searle, "What is an Intentional State?" is reprinted in the volume.) In fact many of the essays in this volume are almost as inaccessible as the originals they discuss, but Dreyfus' introductory essay is well worth reading. Once you have finished it you will either know just what next to read about Phenomenology, and why, or you will know why you have just learned everything you ever needed to know about Husserl's sort of Phenomenology.