Why do we do as we do?

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Patterns, Thinking, and Cognition: A Theory of Judgment. By Howard Margolis. *University of Chicago Press: 1988. Pp.332. Hbk $45, £35.95; pbk $15.95, £12.95.*

ONCE there was formal logic, an instrument of shining beauty. Developed at the turn of the century by Gottlob Frege and Bertrand Russell, it was designed primarily to clarify mathematical reasoning and was apparently successful in doing so. Then came probabilistic inference, which was somewhat less elegant but offered models of rational decision-making that might prove applicable across a range of scientific and everyday contexts. So, in the late twentieth century, we can hope to fulfil a leibnizian dream, to see thinking as a species of symbol-manipulation and to resolve disputes by calculation. There are areas in which improvements are needed — our understanding of inductive and analogical reasoning is imperfect — but, given time, statisticians, philosophers and the artificial intelligentsia will remove any remaining warts from our image of human reasoning and cognition.

Howard Margolis believes that the project is wrong-headed and our confidence in its successes misplaced. He has written a stimulating book that attempts to make us see things differently.

Margolis begins with the idea that thinking and judgment are species of pattern-recognition. So, what is a pattern and what is pattern-recognition? We are not told, for, as Margolis admits, "no one can say much yet about what the brain is doing when it recognizes a pattern" (p. 3). But his reluctance to speculate does not doom the enterprise, for the central task of the first part of the book is to relate the primitive concept of pattern-recognition to other psychological notions and to aspects of human behaviour. The initial step is to view the activation of patterns as primary, the provision of reasons being a subsequent way of rationalizing judgment either for ourselves or for others. In Margolis's telling analogy, our sincere accounts of our reasons for arriving at a particular decision are like the protestations of the post-hypnotic patients who find excellent excuses for jumping up and scratching their ears. But, in our case, it is the cueing of a pattern, not the suggestions of the hypnotist, that causes the judgment or decision.

Pattern-recognition, Margolis claims, occurs among most multi-celled animals and has an evolutionary history of over 500 million years. An important project for the early part of the book is to explain how various types of cognitive process — learning, choice, judgment, reasoning and calculation — can be understood as successive developments of pattern-recognition. Thus Margolis attempts to describe a 'cognitive ladder' that will lead from the simplest types of pattern-recognition, which he sees as being distributed widely across the animal kingdom, up to the more specialized types that occur (so far as we know) only in our own species. The description is self-consciously darwinian. Margolis emphasizes the continuity of the processes in his sequence, and endeavours to relate the innovations to hypothetical adaptive advantages.

We can now make more explicit the contrast between intuitive judgments and the 'logical justifications' that people offer for them. On Margolis's account, an intuitive judgment occurs when a pattern is activated: something comes to 'look right' to us. We may reflect on the situation, offering reasons for judging as we do, and then examine those reasons. At its most explicit, the process may involve appeal to the canons of formal logic, an appeal that Margolis construes as the activation of recondite patterns, cued by linguistic similarities, that can have emerged only late in the history of human pattern-recognition. The reflections may prove congruent with the original judgment, reinforcing our sense that we have judged correctly, or they may be at odds with it. Using the potential for match and mismatch, Margolis offers an interesting account of many vexed cognitive concepts (belief, knowledge, doubt and so forth) and an analysis of learning.

Although his presentation is illustrated by familiar examples from the psychological literature, it is only in the second half of the book that Margolis begins systematically to assemble evidence for his claims. One source of support is a re-evaluation of the famous tests designed by Wason, Johnson-Laird, Tversky, Kahnemann and others to expose foibles of human rationality. Margolis brings a genuinely novel approach to this material. Unlike many other writers, he does not trace our cognitive lapses to the abstract formulations in which some of the tasks, such as Wason's card-selection experiment, are presented — there is no deep problem in acquiring principles of formal reasoning. Margolis believes that people can come to employ those sophisticated patterns that are activated in the doing of logic.

The troubles stem from the fact that we have other patterns at our disposal which are cued when we are set certain types of problem. The consequence is that we sometimes fail to reach the conclusions that logicians recommend. Margolis suggests that two separate kinds of factor promote the miscueing: *semantic* factors

Flights of fancy — in 1835 the New York Sun, *a small local newspaper, published a series entitled "Remarkable discoveries made at the Cape of Good Hope". Claiming to be extracts from articles by Sir John Herschel in the* Edinburgh Journal of Science *(not then in publication), the pictures showed in detail the 'batmen' inhabiting the Moon. The paper's sales shot up until the hoax was exposed as the work of the journalist Richard Adams Locke, but not before being reprinted and translated into several languages. The picture is taken from* Under Capricorn: A History of Southern Hemisphere Astronomy *by David S. Evans, published by Adam Hilger, price £29.50; in the United States distributed by Taylor & Francis, $78.*