

Mike Oaksford and Nick Chater have contributed to this book too, with an interesting study of the role of deduction in common sense reasoning. Calling into question the significance of current psychological theories of deductive inference, they suggest that performance on many existing laboratory reasoning tasks can be better understood as non-deductive in nature. In his article, Lance J. Rips warns against certain reductionist tendencies in the theory of rationality, in particular, the practice of reducing deductive to inductive reasoning, or *vice versa*. Rips judiciously holds that deductive validity and inductive strength are essentially different concepts. His most suggestive evidence is two recent neuro-imaging studies indicating that inductive and deductive reasoning tasks even activate different parts of the brain. The book ends fittingly with an ecumenical paper by Richard Samuels, Stephan Stich and Michael Bishop. In their view, the differences between two main traditions in the study of rationality – evolutionary psychology, and the heuristics and biases tradition – are less pronounced than is usually assumed. Instead, there is an emerging consensus on fundamental points. This is a clever and insightful paper, and it is difficult to imagine a better closing chapter for this fine collection.

These two volumes should attract many philosophers, computer scientists and psychologists interested generally in the concept of rationality. My first choice is definitely *Common Sense, Reasoning, and Rationality*, which as far as I can tell has no weak moments. But the more philosophically orientated *Reason and Nature* also contains some fine work well worthy of the attention.

Lund University

ERIK J. OLSSON

*Cause and Chance: Causation in an Indeterministic World.* EDITED BY PHIL DOWE AND PAUL NOORDHOF. (London: Routledge, 2004. Pp. viii + 211. Price £55.00.)

This is a collection of new papers by leading philosophers of causation concerned to reconcile causation with indeterminism. Their shared assumption is that, as the editors put it, 'there are particular events which lack a sufficient cause [and] ... at least some of them are caused'. Their concern is not of course new: several theories of causation allow it to be indeterministic in this sense. In particular, besides those that simply require a cause C to be necessary rather than sufficient for an effect E, there are those that invoke E's probability P(E), usually by requiring C to raise it, which C can do while being neither sufficient nor necessary for E.

However, this probabilistic extension of deterministic causation raises serious issues, which the papers here tackle in various ways. The most often discussed is whether C really must raise P(E), given well known counter-examples, e.g., where C or E pre-empts an alternative cause C\* that would make E more probable than C does. Some contributors reject the probability-raising condition for this reason; others defend or modify it, e.g., by requiring C to raise P(E) only in C\*'s absence.

Then there are issues about understanding any probability  $p$  that C gives E. Should this be expressed by a subjunctive or counterfactual conditional 'P(E) =  $p$  if C', or by the conditional probability  $P(E|C) = p$ , defined as  $P(E \& C)/P(C)$ ? This affects what it is for C to raise E's probability: is it for P(E) to be greater if C than if

$\neg C$ , or for  $P(E|C)$  to be greater than  $P(E)$ , or than  $P(E|\neg C)$ ? Either answer raises more questions, such as: what, on possible-world semantics, fixes the  $p$  for which  $P(E) = p$  if  $\neg C$ ? Does  $C$  itself really need a probability,  $P(C)$ , in order to give  $E$  a probability  $P(E|C)$ ?

The answer to this last question depends on what kind of probability  $P(E)$  or  $P(E|C)$  is: subjective, physical or logical. Most of the contributors take  $P(E)$  to be a physical probability, an assumption that fits the ' $P(E) = p$  if  $C$ ' reading better than the  $P(E|C) = p$  reading. One exception is Tooley, who argues for a logical reading of these probabilities. No one, however, argues for a subjective reading, which is the only one that makes prior probabilities like  $P(C)$  relatively unproblematic. I suppose this is because all the authors here take causation itself to be objective, an assumption which I too accept, but which is not after all uncontentious. A subjective theory, of how whether we *think* of  $C$  as causing  $E$  depends on our credences in  $E$ , conditional on  $C$  and on  $\neg C$ , would have been a useful complement to the other papers in this volume.

More discussion of the *point* of saying, of specific  $C$  and  $E$ , that  $C$  causes  $E$  would also have been useful. Most of these papers only test (e.g.) the probability-raising claim against what we are inclined to think about real or imagined cases, several far-fetched and some arguably impossible. These applications of the maxim 'Don't ask for the meaning, ask for the use', i.e., for our unreflective extension of a term, seem to me inconclusive. For if the apparent extension of 'causes' is important, so is its intension, i.e., what we think follows from applying it, and it is not obvious that where they conflict, the former always trumps the latter. Take the implication that we can be morally or legally liable for, and only for, the effects of our actions, because a feasible cause  $C$  of an effect  $E$  is *ipso facto* a means to  $E$ . This implication is hard to make sense of unless  $C$  must raise  $E$ 's probability, and those who reject that constraint on causation owe us an alternative explanation of it.

Another matter that could do with more discussion than it gets here is what is meant by calling causes and effects 'events'. For while this is the standard term for singular causes and effects, it means different things to different theorists, and some of these differences affect the content of their theories. For some, events are 'thin' Davidsonian particulars; for others, they can be thicker or thinner, depending on what it would take for them not to exist; and for one author here (Ehring) they are persisting tropes. Which of these or other kinds of entity causes and effects are is something that matters, for example, to our reading of causal probabilities. In particular, on any interpretation of probability, any entity  $E$  with a probability  $P(E)$  must have an analogue  $\neg E$  of a negation, with a probability  $1 - P(E)$ , and analogues of disjunctions and conjunctions, as in  $P(E\&C)/P(C)$ . Similarly the antecedents ' $C$ ' and ' $\neg C$ ' of the conditionals ' $P(E)$  if  $C$ ' and ' $P(E)$  if  $\neg C$ ' need truth-values, even if those conditionals do not.

Yet as one author here notes, on most readings of 'event', the existence of negative, disjunctive and conjunctive events is highly debatable. Here, as usual, that debate is bypassed, and the truth-value problem solved, by tacitly reading ' $C$ ' in ' $P(C)$ ' and 'if  $C$ ' as ' $c$  exists' for whatever kind of entity the cause  $c$  is taken to be (and similarly for ' $E$ '). But this reading raises further questions – e.g., what, in

counterfactual contexts, is it for *c* or *e* not to exist? How can *c*'s or *e*'s non-existence be a cause or effect? etc. – whose answers may well depend on what kind of entity *c* and *e* are.

The lack of an agreed reading of 'event' also makes it hard to see in several cases how the doctrines of different papers in this volume are related. This exemplifies a more general feature of the volume, which may be inevitable in important new work on a complex and contentious topic. This is that few of its papers are at all self-contained: their authors mostly assume a knowledge and understanding of their own previous work which not all readers will have, and certainly not those who are new to the subject. So while the book contains valuable additions to existing literature on indeterministic causation, it is not – and does not claim to be – a very useful introduction to the subject.

*Darwin College, Cambridge*

D.H. MELLOR

*Humans and Other Animals*. BY JOHN DUPRÉ. (Oxford UP, 2002. Pp. vi + 272. Price £17.99.)

We humans have a passion for categorizing what we experience into kinds. At least since Socrates, the question whether we should understand this as *recognizing* natural groupings, or as *creating* groupings according to our various interests, has been central to the quest to understand ourselves and our relation to the world. In one way or another this is the motif of almost all the engagingly written essays in Dupré's collection.

These pieces, published between 1981 and 2002, represent over twenty years of reflection. They fulfil the two essential desiderata for such a collection: they are thematically related, and they have stood the test of time. Moreover, the views expressed show an interesting 'evolution', about which I shall have more to say later. As well as the ubiquitous theme of classification, there are a number of other related discussions, including a scathing critique of evolutionary psychology, and explorations of the light shed by recent research into 'animal minds' and 'animal language' on whether our capacity to categorize essentially distinguishes us from our nearest neighbours in any evolutionary scheme of classification.

Dupré is well known for defending 'promiscuous realism', a view so named, he tells us, by John Perry. The realism derives from the belief that there are in nature relations of similarity and difference that distinguish things, the promiscuity from his belief that the classifications we base on these relations are interest-relative, with none privileged over others. What are his core arguments? In ch. 1 the starting-point is a critique of the essentialism underlying causal theories of reference. Dupré sees two crucial errors here. First, a post-Darwinian understanding of biological kinds thoroughly undermines the idea that biological science is involved in a search for their metaphysical essences. Secondly, the assumption that science is in the process of getting at the essences of those kinds first identified with the stereotypes of ordinary referential practices is false. The kinds marked in ordinary language typically have little to do with those marked by our scientific classifications.