

ill feeling when it occurred. Unfortunately, the translation does not always do justice to the material, and the reader is quite often left floundering as to the meaning of whole sentences. But this is relatively trivial considering the scope and ambitious nature of the overall work. Be warned, however: this is not popular scientific biography.

It is serious stuff, best suited, I suspect, for the committed student and academic.

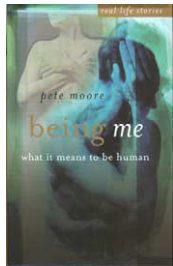
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Being of my opinion about humans

Being Me: What it Means to be Human by Pete Moore, John Wiley & Sons, 2003. £16.99 (277 pages, hardback) ISBN 0470850884

John van Wyhe

Department of History & Philosophy of Science, Cambridge University, Free School Lane, Cambridge, CB2 3RH



What does it mean to be human? Everyone has a different opinion; hence there are as many answers to this question as there are humans. Journalist Pete Moore is afraid that the scientific developments of our time, especially in genetics and neuroscience, will lead us to a tragically brave new world in which people will be used as meat for evil medical experiments. In order to prevent such a fate, Moore believes that we should adopt his view, which he presents in *Being Me*, of what it means to be human.

Through lengthy interviews with people such as a born-again Christian body builder, a woman who was in a coma for an extended period and believed to be brain dead but who later recovered, a man with a disfigured face and the Archbishop of Canterbury, Moore hopes to belie scientific understandings of human beings. Unfortunately the interviews add nothing but length to Moore's case, which is the truism that human beings exhibit a broad range of behaviour and lead very complex psychological and social lives. Furthermore, such a point does not contradict the perceived bogey of a scientific understanding of human beings.

Moore seems to think that, if taken uncritically, recent scientific developments might lead people to believe that human beings are only animals. He worries that there is a danger we might conclude that humans are only genes or only brains. In order to convince readers of the dangers of viewing people as such evil straw men, Moore quotes writers like Richard Dawkins or Steven Pinker making their usual point that genes are more important in determining how a person ends up than most people realize. These arguments of degree are repeatedly paraphrased by Moore as absolutes: 'you are your genes and nothing else'. Which, Moore hastens to add, is terrible!

Yet modern genetics and neuroscience have not suddenly discovered what Moore fears. Even before the

work of Charles Darwin it was recognized that human beings are animals. It was known that all living beings are composed of the same chemical substances, are made up of cells, experience growth, die and so on. Genetics simply demonstrates what we already knew to a more precise degree. Similarly, modern neuroscience has not discovered that 'the mind' is a function of the brain. This has been known for centuries with as much certainty and convergence of diverse evidence as the roundness of the earth. Instead modern neuroscience shows us the fact in more startlingly brilliant detail than ever before. Yet, Moore writes: 'the arguments that we are animals and nothing but is self-defeating because if we were "nothing but animals" we wouldn't know that we "were nothing but animals!"' One need not point out that such rhetorical arguments are powerless to contradict biochemistry, palaeontology, genetics, evolutionary biology and so forth because the point is vacuous. Either it means we are not organisms, which is false, or that humans are a unique species, which is a tautology.

One example must serve to give a sense of *Being Me*. The book presents this quote by the celebrated neuroscientist Vilayanur Ramachandran:

Even though it is common knowledge these days, it never ceases to amaze me that all the richness of our mental life -all our feeling, our emotions, our thoughts, our ambitions, our love life, our religious sentiments and even what each of us regards as his own intimate private self - is simply the activity of these little specks of jelly in your head, in your brain. There is nothing else.

This statement of fact by one of the world's leading neuroscientists is countered with another of Moore's moral appeals: 'in the real world...people realise that we are more than can be made sense of by any study of the material nature of our brain.' Yet Ramachandran's statement is uncontroversially true. Moore, although he deplores this fact, has no evidence to contradict it. Instead he seeks to discredit it by an *ad populum*.

Readers who already share Moore's opinions about what it means to be human might enjoy *Being Me*, but others will remain unconvinced. Indeed, this is the paradoxical character of this book. Moore seeks to promote a particular subjective take on human beings, yet if there is one thing we know about ourselves it is that we will never all agree about a subjective question of value. If there is anything to fear it is books that argue that

knowing what humans really are must lead to evil, and in place of evidence talk of our 'spiritual' nature and Gaia theory to conclude that being human really means being of my opinion.

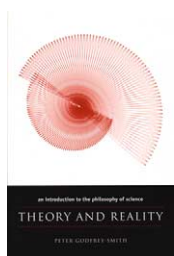
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In quest of what there is

Theory and Reality – An Introduction to the Philosophy of Science by Peter Godfrey-Smith, The University of Chicago Press, 2003. US\$24.00 (paperback, 272 pages) ISBN 0 226 30063 3

Jürgen Klein

English Literature/British Cultural and Intellectual History, Ernst-Moritz-Arndt-Universität Greifswald, Steinbeckerstraße 15, D-17489 Greifswald, Germany



Theory and Reality – An Introduction to the History and Philosophy of Science is a clear-cut book that introduces the philosophy of science as a dramatic story. The historical approach taken by Peter Godfrey-Smith is combined with a perpetual stimulation for the reader to reflect, to philosophize in the context of 'learning by doing'. Although he concentrates primarily

on the 20th and 21st centuries, Godfrey-Smith always keeps the development of scientific theory from the 17th century onwards in mind, and outlines the history of scientific revolutions from Nicolaus Copernicus to Ernst Mach. The central argument in *Theory and Reality* addresses the problems of scientific proof and demonstration in the philosophy of science, as well as epistemological and metaphysical issues; all of which refer to the issue of reality. During the early 20th century, the philosophy of science separated normative and descriptive theories, which are a starting point for basic and scientific empiricism, mathematical science and, most recently, the sociology of science.

In *Theory and Reality*, the development of theory integration and differentiation is discussed from the work of the Vienna Circle up to that of Paul K. Feyerabend. During this period, empiricism and induction were used to validate hypotheses and laws, and enabled the internal order of disciplines to be used as a model of knowledge acquisition. Rudolf Carnap developed his probability theory to solve the induction problem (how far we can go in justifying our beliefs when using inductive arguments) and this provoked a critical reaction from Karl R. Popper, who designed his hypothesis to not be an element of a general theory of language, meaning and

knowledge. A demarcation between scientific and non-scientific theories was assumed in connection with Popper's theory of falsification: refutations were decided on single observations, whereas confirmations became mythical. However, recourses to inductive logic are superfluous for Popper, who claims that theories must take risks (corroboration instead of confirmation).

The choice between theories became a focus in Thomas S. Kuhn's *The Structure of Scientific Revolutions* (Chicago, 1962), when he explained how scientific development was caused by normal paradigmatic science and revolutions, a hypothesis hotly contested by Popper. Paradigms are grounded in fundamentals and method, and they lose validity as anomalies accumulate or when a scientific revolution occurs. Kuhn argued that the puzzle-solving element of science needs scientists who do not contest fundamentals. However, this is a problem because Popper's claim for openness in science is frequently seen from the perspective of experimental science in the context of conjecture and refutation, whereas Kuhn's ideas on developing science through new paradigms (such as scientific revolutions like those brought about by Isaac Newton and Albert Einstein) are less clear-cut. Kuhn's approach deals historically with philosophical questions about reason and evidence, but, as a result, he mixes up descriptive and normative aspects of theory. Logical empiricists will never accept such as procedure because they sharply distinguish between the history of science and scientific evidence and justification.

Younger theorists subsequently rejected the restrictions they perceived in these approaches. Imre Lakatos rejected Popper's call for only one paradigm per field, suggesting instead competition between different research programmes because a programme might induce change, so its application could increase predictive power. Larry Laudan transferred this concept to 'large scale units of

Corresponding author: Jürgen Klein (kleinj@mail.uni-greifswald.de).

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