DONNA HARAWAY, **The Haraway Reader.** New York and London: Routledge, 2004. Pp. viii + 352. ISBN 0-415-96688-4. £16.99 (paperback).
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In the novels of Dorothy Sayers, Harriet Vane once asks her suitor, Lord Peter Wimsey, 'Do you find it easy to get drunk on words?' Ruefully, he replies that, for him, this is '[s]o easy that, to tell you the truth, I am seldom perfectly sober'. Although this example is drawn from the genre of detective rather than science fiction, it seems a good place from which to begin a consideration of Donna Haraway's writings, since intoxicated exhilaration is not only experienced by her reader but is self-evidently the position of the writer. One emerges from this collection of her work over the last twenty years with a sense of exhausted achievement, like a swimmer staggering ashore having been tossed and battered by a very rough sea. In one of the pieces, Haraway complains that some critics have accused her of adopting a deliberately obfuscatory style of writing. With some justice, her response is to point to one of the main wellsprings of inspiration for her wider project: the concept of clarity, or, to put it another way, fixity of meaning, is one of the key assumptions that she is trying to undermine. Meanings are always layered, categories are confused even as they are created, and the existence of a boundary is itself an invitation to transgression. It is, as she argues, turtles, turtles all the way down.

Ironically, although Haraway's writings represent a sustained attack on the dualisms that have characterized Western philosophy (or, perhaps, the underexamined assumptions of biologically bilateral beings), there are just two central themes that consistently dominate these pages. The first is the demonstration of the located nature of both material and practice. Adopting the figures and the positions of the cyborg, the coyote, the modest witness, the vampire, the white rabbit, the lying keyboard and the metaphorical mirror, Haraway moves through art and literature, science and advertising, protest and practice, to show how presumed analytical borderlines can become front lines in the struggle to understand, and so avoid, the structures and technologies of domination which underlie what is taken for granted in the cultures that surround us. Much of Haraway's work turns on the idea that contradiction and confusion are in fact the only safe places from which to begin the reconstructions of identity that enable escape from the dialectics of dichotomy. Perhaps one needs to get drunk on words to dare to attempt a conceptualization of nature that can move beyond dualisms (simple or complex) and towards a much messier, context-laden, contradictory version of bio-politics, where the nature of authority and the authority to speak of nature are simultaneously intertwined and in opposition.

The second theme bears more straightforwardly on science studies. Particularly in her later writings, Haraway has directed attention to the contradiction that is gender-in-science studies – the extent, that is, to which feminism and feminist perspectives still remain very much 'bolted-on' extras in a field allegedly committed to a symmetrical examination and understanding of both people and practices. It is unquestionably odd that at the beginning of the twenty-first century, categories such as 'gender', 'race' and 'sex' can still be seen as specialized, even if no longer ghettoized, subjects within the field. Fair enough, most science is and has been done by straight white men; but straight white men have a gender, a race and a sexuality too. Ignoring or avoiding these structures while attempting to account for the understandings of the world developed by these individuals not only restricts the nature of the story that can be told, and artificially so, but also risks the unconscious reiteration of the myth of objective, culturally neutral science and scientists – the very myth that science studies has been concerned to address and confront.

Overall, this book represents an excellent survey of, rather than an introduction to, Haraway's oeuvre. Although the author's preface does a very good job of establishing Haraway's own writing context, it is simply too short to do the work that the uninitiated require. Returning to my earlier metaphor, readers are effectively forced to leap from the rocks into an unknown

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tide after listening to a short description of how to do the doggy-paddle. Additionally, in that preface, Haraway mentions her sense that she has 'written the same paper twenty times' (p. 2). I disagree, but it is unfortunate that in at least one place sentences and paragraphs are reproduced almost word for word from earlier chapters. Closer editing would have eradicated this defect. Taken as a whole, however, the papers selected succeed in representing the breadth and scale of Haraway's ambitious project, and as such will provide an extremely useful reference and teaching tool.

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Peter J. Bowler and Iwan Rhys Morus, **Making Modern Science: A Historical Survey.** Chicago and London: University of Chicago Press, 2005. Pp. viii + 464. ISBN 0-226-0681-7. £17.50, $25.00 (paperback).
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Peter Bowler and Iwan Morus have had the bad luck to publish their textbook just after a really good one appeared. It is *Historia de la Ciencia* (Madrid, 2005) by Carlos Solís and Manuel Sellés, professors at the Spanish equivalent of the Open University. The Spanish history is exact in dates and concepts, keys illustrations to the text, employs apt equations and diagrams, develops interesting points and prospects in sidebars, and exploits and deploys a deep historiography. By unhappy contrast, the English history is sloppy in details and occasionally wondrously wrong, treats illustrations mainly as decorations, avoids equations, separates its information into 'Episodes' and 'Themes', and insists on a historiography not much older than *Leviathan and the Air-Pump* (Princeton, 1985). *Historia de la Ciencia* is old-fashioned in privileging theory (although it does not ignore questions of patronage and connections with technology), whereas *Making Modern Science* is infused with the postmodern fetish of the local and contingent.

The following examples suggest that Bowler and Morus's book is not a reliable guide to the science it analyses. *Item*: 'This was how [Bohr] solved the problem of atomic stability. The electrons orbiting the nucleus were not radiating continuously, they only did so at particular frequencies … . They only released energy when they changed from one [stationary] state to another, and the energy they released in that process was a multiple of h and their change of frequency' (pp. 259–60). Electrons do not radiate at all in a stationary state; the frequency they emit in their quantum jumps is h times the difference in energy between their initial and final states. *Item*: 'In his *Mysterium cosmographicum* of 1596, [Kepler] showed that … the spacing of the six planetary orbits can be explained by showing that the spheres defined by the orbits are separated by the six regular Platonic solids (tetrahedron, cube, etc. – these are the five solids that can be constructed with all the faces of identical shape)' (p. 351). Five or six? In fact, with Bowler and Morus's definition, as many as you please. The faces of a Platonic solid must not only be identical, they must be the same regular polygon, and the faces must come together at the same solid angle. Then there are only five.

Let us turn to pictures. Figure 2.1 depicts three heavens beyond the sphere of the fixed stars; its caption reads, 'The sphere of fixed stars marks the outer boundary of the universe.' Figure 2.3 presents Thomas Digges's famous diagram with stars strewn through space. Caption: 'Note that the universe is still bounded by the sphere of the fixed stars.' Figure 2.4, Tycho's mural quadrant, has the label, 'From Tycho Brahe, *Astronomiae instauraiae* [*sic* – '*instauratae*'] *mechanica* (1587 [*recte* 1598]).' Newton does not rate a picture. A reproduction of the title page of the *Principia* would have been useful, for then anyone could have seen that it does not 'announc[e] to the world that he had uncovered the secrets of nature' (p. 46), as Bowler and Morus claim, but reads, in its entirety, *Philosophiae naturalis principia mathematica*.

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