swered and tantalizing leads that are not followed through. Why, for example, did it take so long for Dutch chemists to become organized? Is it merely a question of numbers, as Snelders seems to indicate? What were the relationships between the physics community and the chemistry community? Why was it relatively easy for physical chemistry to develop in the Dutch situation? All in all this handsome and well-printed book, written by the doyen of Dutch historians of chemistry, should provide guidelines for future research. I look forward to the year 2003, when the KNCV celebrates its centennial and a promised second volume, covering the twentieth century, will be written.

ARIE LEEGWATER


Was Christian theology the principal source of the differences between Greek science and early modern science? The question would have shocked Voltaire, provoked a heated denial from Andrew Dickson White, and astonished George Sarton. Yet just when those two children of positivism, whiggism and the warfare thesis, seemed at the height of triumph in the period between the world wars, others were working to turn positivism on its head by showing that religious assumptions about nature and knowledge were deeply embedded in the ideas and practices we associate with the modern scientific world view. One of these renegade scholars was the British logician Alfred North Whitehead, who argued that the very possibility of modern science depended upon the unconsciously held belief, derived from medieval theology, that the created order was indeed intelligible. This point has not led to much scholarship in the history of science, although Whitehead’s process meta-

physics has had a profound influence on modern theology. Another renegade was the American sociologist Robert Merton, whose work on the influence of Puritanism on the social activity of science in England has led to a veritable mountain of research, most of it inconclusive though still of great interest to students of the seventeenth century. Yet another renegade was the central figure in the books reviewed here, the late British philosopher Michael Beresford Foster. Foster’s very strong claims about the influence of Christian theology on the epistemic content of early modern natural philosophy have also inspired much research, though a mere foothill next to Merton’s mountain.

Foster made his long, convoluted, often confusing argument in a series of three articles published in the journal Mind in the mid 1930s, early in his career as a Student (read, “tutor”) at Christ College, Oxford. His unabashedly intellectualist approach focused on the doctrine of creation as the vehicle through which theology impinged on natural philosophy and identified the source of modernity in science as the voluntarist attitude toward God within the Christian tradition. According to Foster, only a voluntarist theology makes God’s creative activity truly free: the products of God’s creative activity are not necessary, but contingent, from which it follows that the created world can be known only by a science that is fundamentally empirical rather than a priori.

The first of the volumes reviewed here reprints Foster’s Mind articles along with four others (three of them almost unknown) that further develop his main points and offer brief remarks on some other theological and philosophical issues raised by modern science. An apparently complete, annotated bibliography of Foster’s writings is also included. This is noteworthy in itself, since Foster remains a viable source of provocative statements about religion and science, and his articles (even including those in Mind) are hard or impossible to find on the shelves of many research libraries.

But there is much more, including reprints of two famous articles on Fosterian themes by the theologian Rolf Gruner and the historian Francis Oakley. Gruner takes issue not only with Foster, but with all “revisionists” who see Christianity as the source of modern science. His goal is to put a stop to the apologetic uses of revisionism, in the hope that “many theologians will perhaps think it in fu-
ture more promising to further the prestige of their religion by maintaining that it demands man’s respect for his so-called environment rather than its manipulation and control” (p. 214). Against revisionism he argues that true Christianity is contemplative rather than active, and really has more in common with the classical world than with the modern. He also attacks the highly abstract, unhistorical nature of the revisionist argument—a fair challenge when leveled at Foster and certain others at the time Gruner raised it in 1975, but one that cannot be mounted against much recent scholarship along Fosterian lines. Oakley’s paper, first printed in 1961, argues that the medieval voluntarist notion of natural law imposed on the world by arbitrary divine will became the dominant view during the Scientific Revolution—a view that he still holds, according to an interesting afterword written for this volume. Although this is certainly Fosterian, Oakley states that he saw Foster’s essays only when his own work was almost finished. (Like Reijer Hooykaas and some others, Oakley came to similar conclusions from a different, more genuinely historical starting place.)

Six more essays, written specifically for this volume, offer critiques of various aspects of Foster’s main message. Generally they will have little appeal to historians of science, except insofar as they help round out the picture of Foster and his thought, which embraced political philosophy as well as science. But James Patrick’s essay about Foster’s place in historiography should be read for its illuminating portrayal of Foster as a foil to Etienne Gilson: Foster emphasized the seminal role of Descartes and the early modern tradition in bringing about modern science, where Gilson and the neo-Scholastics placed the origins of modernity in the Middle Ages. This explains why a journal like Mind published ideas like Foster’s, a fact that has long puzzled me. It also explains why Stanley Jaki’s paper is so negative, a contumacious response to Foster replete with cheap shots directed at other scholars who do not share Jaki’s view that modern science began in the fourteenth century. For opposing Gilson and ignoring Pierre Duhem, Foster is all but confined to perdition. It is unfortunate that Jaki has chosen to shout down, not to talk with, his opponents, for his important points about the relevance of medieval theology (which Foster missed or would not grant) are difficult to hear over the din.

But the most important new essay by far is Cameron Wybrow’s own piece that opens the collection, a study of Foster’s troubled life, dedicated work, and self-inflicted death that is thoroughly researched and exquisitely sensitive to the various influences that operated upon him. The overview of his thought is splendid and entirely without parallel in the literature. It is easy to accept Wybrow’s conclusion that Foster’s attempt to “dance on the grave of Greek thought” (p. 43) while placing “the stamp of Christian approval upon a world-view already articulated by modern philosophy” was far too glib. Yet I cannot agree that the “only crucial question” in appraising Foster’s work is whether “he hit upon a true affinity between modernity and Christianity” (p. 44). For most historians, surely, it matters little whether Foster was correct to make Christianity so modern; what matters is whether his analysis helps us to understand the relation between theology and science as it was actually worked out in the seventeenth century. Here I can do no more than state my view that it most decidedly does and point to the fact that I am hardly alone in saying this. Numerous carefully crafted historical studies, far more than Wybrow seems to be aware of, have established solidly that early modern natural philosophers were deeply influenced by just the sorts of theological assumptions that Foster said ought to have influenced them. Wybrow’s book on Baconianism also argues that the revisionists’ notion of Christianity owes too much to modernity and too little to the Bible and antiquity. Like Gruner, he is eager to refute the “mastery hypothesis,” the frequently repeated claim that the Western urge to master nature is rooted in those parts of the Old Testament that give humans dominion over nature. Defenders of the hypothesis include those who use it for apologetic purposes (Foster and R. G. Collingwood are prominent examples), as well as those who see it as a black mark for Christianity (such as Lynn White, Jacques Ellul, and Theodore Roszak). Wybrow stands with Rolf Gruner above the fray by denying the validity of the hypothesis itself—as he demonstrates, it has never been properly documented by its proponents. Thereby he hopes to deflect both praise and criticism from Christianity and direct them toward what he believes to be the true source of the spirit of environmental conquest: Renaissance humanism, which equated human artistic and technical ability with human creation in the im-
age of God. Early modern thinkers, he believes, made human beings “divine in essence, a kind of God on earth” (p. 166). Wybrow shows that such hubris gains no support from Genesis, which places specific boundaries on the scope and the degree of human dominion, and that both pagan and biblical writers held to a limited view of dominion and were suspicious of the power of technology. Nevertheless Wybrow admits (p. 34) that the mastery interpretation of the Bible, though incorrect, has had “a profound influence” in the West since the late Renaissance. “By appealing to the Bible against the Greeks,” he concludes, Francis Bacon and other early modern thinkers “managed to win widespread consent for the building of a scientific society which proved to be neither Greek nor Biblical” (p. 193).

Wybrow’s book is interesting and well argued, intellectual history on a rather high level. It is best understood as an answer to the recent call by several scholars for a historiography of religion and science that goes beyond the narrow ideological interests of both the warfare thesis and its apologetic antithesis. Whether it will prove a convincing alternative remains to be seen; certainly it stands as a good candidate.

Edward B. Davis

Denis Wood. The Power of Maps. With John Fels. (Mappings: Society/Theory/Space.) viii + 248 pp., illus., figs., index. New York/London: Guilford Press, 1992. $35 (cloth); $15.95 (paper).

It is worth struggling with the awkward and unfamiliar voice that greets the reader in the early pages of Denis Wood’s The Power of Maps because he has some important, indeed compelling, things to say about maps. The book provoked a lot of adjectives from me, varying from lucid, gutsy, great, to earnest to difficult, dense, obtuse, and even obnoxious. Its strength, though, lies in its sophisticated analyses of some of the maps most commonly used in our society. In these analyses Wood effectively applies ideas from developmental and cognitive psychology, evolutionary anthropology, Barthesian semiotics, and postmodernism, as well as from cartography and history.

While writing this book Wood collaborated on a major map exhibit with the same title, held at the Cooper-Hewitt Museum in New York from October 1992 to March 1993; he describes the exhibit as a draft of the book. Perhaps this explains an apparent weakness of the book (but not of the exhibit): its poor use of illustrations. The figures are not labeled by number, there is no list of figures, and they are not explicitly referred to in the text. When a discussion centers on a particular map, the reader does not know whether it is reproduced in the book.

While The Power of Maps is a curiously nonvisual book, it is a conceptual powerhouse. The “weakness” of not being a pretty book is one of its dramatic ploys: its aim is to free us from the tyranny of looking at maps as pictures in order to think about what they mean.

Wood devotes the first chapter to explaining what he means when he says that maps work by serving interests. The chapter lays out themes that are expanded later: the contingent character of all maps, the interests of various social groups in them, and the role of maps as creators of boundaries rather than representers of realities. Wood’s understanding of the evolution of mapping in human cultures provides a searching exposition that takes us, sometimes abruptly, from observations about himself and his sons to a critical and global perspective on the role of maps in history. As the discussion of the next two chapters unfolds, we begin (having accustomed ourselves by now to Wood’s idiosyncratic writing) to appreciate how we too have been fooled. Blinded by fascination with the look of maps, we have been asking what maps depict, not how they structure what we know of the earth and beyond. Maps inevitably bear the stamp of being of some place and from someone’s point of view. What is it that we do not see on the map? Why does one thing get mapped and not another? Forcefully and repeatedly, Wood pushes his readers into experiencing how maps select and naturalize what we know about the world.

In spite of the semiological jargon, Wood’s ten codes of extra- and intrasignification in his lengthy analysis of map sign systems lead to a rich and insightful discussion. He deconstructs the cherished cartographic claim that a map is a system of facts and invites us to understand the two-tiered semiological system that “injects the map into its culture” (p. 142). Ontogeny recapitulates history in Wood’s grand chapter on the history of hill signs. Finally, he urges his readers to become