

Water under the bridge

William H. McNeill

The Geography of Science. By Harold Dorn. *The Johns Hopkins University Press: 1991. Pp. 219. \$41.50, £26.*

ACADEMIC banter, Dorn explains, led him to undertake a course on "science in the Asiatic mode of production" — an enterprise that eventually produced this slim volume on the role that geographical setting plays in the development of scientific thought. The book is not well titled, because the rich variability of geographical environments is conspicuously absent from its pages. Instead Dorn proposes a simple — to my mind an unduly simple — bipolar pattern for the development of science, pitting "Oriental science", characterized by bureaucratic organization and practical value, against "Hellenic science", characterized by individual activity without any practical application.

Dorn argues that what he calls "Oriental science" reflects the importance of irrigation and other forms of water engineering. In oriental societies, governments needed scientists for practical tasks, especially calendrical calculations, and thus organized scientists bureaucratically. In turn, this "hydraulic hypothesis", as he calls it, "belies the notion of a 'unitary science' in the ancient world. Instead science would appear to have a double root — Oriental and Greek".

After setting up this dichotomy, Dorn examines four instances where he believes that the bureaucratization of science was influenced by demands for water engineering. He chooses Ceylonese, Chinese, Mayan and Pueblo Indian examples, presumably because the diversity of these cultures means that any convergences of their science may be interpreted as reflecting the importance of water engineering in shaping their science. What he finds, of course, is organized concern about the calendar, although the evidence of 'bureaucratic science' among the Pueblo Indians is slender to say the least, limited to markings on a cave wall that probably recorded the solstices accurately with the help of holes in specially constructed sighting stones.

Dorn then devotes a chapter to ancient Greek science, and proceeds to analyse how the antithetical traditions of Greek and Oriental science mingled in the Hellenistic, Roman, Moslem and Byzantine worlds. This is followed by a chapter on science in Europe above the 40th parallel, in which he concentrates almost wholly on the so-called 'scientific revolution' of early modern Europe. There, he declares, a new basis for state power, based largely on gunpowder

weaponry, created a new kind of official need for practical science without, however, extinguishing the Hellenic heritage of useless, individual scientific research. Dorn finishes by showing how water engineering in what was once called the Great American Desert now provides the principal basis for the bureaucratization of science in the United States.

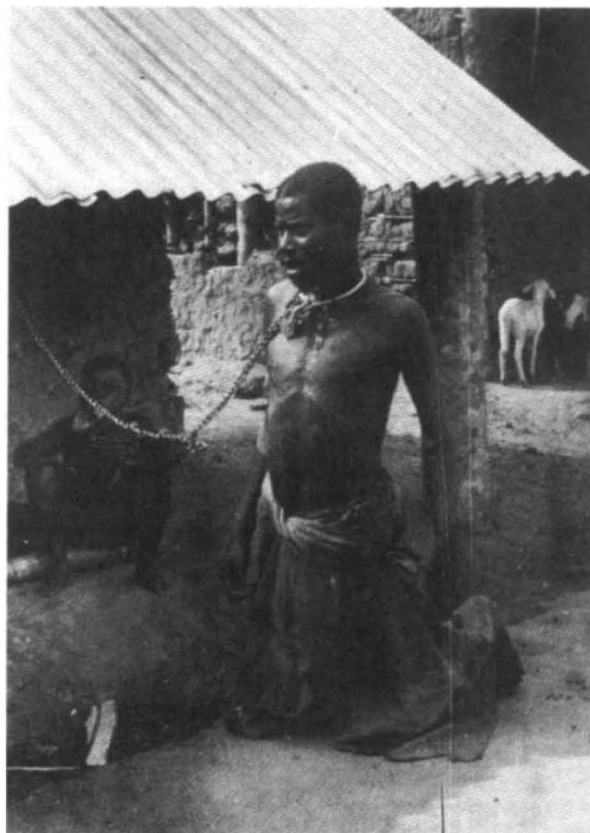
Dubious assertions abound in Dorn's pages. I doubt, for example, whether Philip of Macedon is properly dubbed a "water king" or that his consolidation of power depended on water engineering. Similarly, the remark that "technology in contrast with science, was historically an affair of the country rather than the town" seems so lopsided as to be plainly wrong. He cites mining and the construction of aqueducts and canals as evidence for the rural character of technology; but what about all the artisanal skills that centred in towns? Out-and-out errors also suggest that Dorn's effort to explore the Asiatic mode of production across space and time led him to investigate unfamiliar materials too hastily. He tells

us, for instance, that the Near East "was intensely hydraulicized but failed to achieve an Iron Age" and, more trivially, that Attalus of Pergamum set up his famous library "upon his inheritance of Persia." Historians will be surprised by both assertions.

Dorn does offer a few shrewd observations. In arguing that applied science in Europe "is largely a nineteenth century development", he points out that "the niche that applied science currently occupies in industrial societies was already filled in early modern Europe by the occult sciences — alchemy, astrology and magic."

This observation strikes me as persuasive, but it calls into question the simple dichotomy around which Dorn builds his book. His account of Greek science — pure and individual, and without any institutional base whatsoever — can be maintained only by banishing pythagorean and other occult or semi-occult forms of speculation from the purview of 'science'. But such a separation is profoundly unhistorical. Mystical and some quite material theories, for example the humours of galenic medicine, had very practical ends in view and played a prominent part in Hellenic and all subsequent science. And, as the history of freudianism shows, this form of science remains alive and kicking today.

So the contrast between the two types of science that Dorn proposes is to my



In 1901, a devastating epidemic of human trypanosomiasis, or sleeping sickness, erupted in Uganda, killing more than 250,000 people. The Europeans had seen their colonization of Africa as a civilizing mission, bringing with it the gift of Western medicine. But by the 1960s and independence, many Africans had come to regard sleeping sickness as the 'colonial disease', mainly because of the truly draconian measures that were taken by some colonial administrators to check its spread. Pictured here is one of a series of lazarets that made up the *cordon sanitaire* around the Uele district in the Belgian Congo. The social history of the disease in northern Zaire between 1900 to 1940 is the subject of *The Colonial Disease* by Maryinez Lyons. Published by Cambridge University Press, price £50, \$79.95.