



Michael Adas. *Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance.* Ithaca: Cornell University Press, 2015. 456 pp. \$26.95, paper, ISBN 978-0-8014-7980-9.

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Assessing the scholarly merit of as canonical a volume as Michael Adas's *Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance*, now reissued in a second edition twenty-five years after its initial publication, is no straightforward task. The book's general thesis is well known and broadly accepted. Drawing on predominantly European-authored materials ranging from scientific and travel accounts to literary works, and with comparative emphasis on Africa, India, and China, Adas argues that scientific and technological achievements have served as Western-centric indicators of human worth in the modern period. Before this time, religious and cultural factors were the principal benchmarks, owing to the fact that Europeans frequently adjudged non-Western technologies superior to their own. By these standards, India and China impressed with their engineering and agriculture and China stood out for the perceived efficacy of its imperial administration, while Hindu polytheism repulsed and African societies appeared to fall short in both material and cultural terms. With the Enlightenment, science joined religion and culture as evaluative categories. Chinese aptitudes, apparently hamstrung by government corruption and inordinate fidelity to custom and tradition, fell the furthest by these criteria, while Chinese innovations like gunpow-

der and printing seemed to require Western innovation to unleash their full potential. Indian accomplishments, on the other hand, gained favor with the Orientalist discovery of ancient Hindu literary and scientific works, though this high regard did not extend to present-day Indian culture, widely held to be degenerate after centuries of Mughal rule. Abolitionist sentiment likewise improved perceptions of African peoples, although technological differences were still routinely cited as proof of inequality—or even, in the hands of proslavery writers like Edward Long, of racial inferiority.

In the nineteenth century, Long's views became ascendant, as revolutionary technologies—iron-working, steam power, telegraphs and electricity, among others—apprised Westerners of their apparently superior mastery of nature. Such comparisons prompted Thomas Babington Macaulay's sweeping dismissal of Indian learning and James Hunt's downright vicious portrayal of Africans. Europeans seemed to take particular gratification in castigating Chinese accomplishments—perhaps, Adas hypothesizes, as a means of compensating for China's former prepotency in technological and governmental matters. These disparagements were at the root of the nineteenth-century civilizing mission, which justified colonization endeavors on the grounds that less

avored peoples would benefit from the imposition of Western knowledge systems, labor norms, and trade infrastructure, even while the sheer ferocity of these compulsory transformations undercut any semblance of altruistic motivation. Toward the end of the century, the alleged cultural and cognitive divide between Europeans and subjugated peoples acquired a veneer of permanence with the preponderance of biological approaches to the comparative study of human societies, drawing considerably on Darwinian natural selection as well as emerging sciences like phrenology and craniometry. Assimilationist priorities thus gave way to an emphasis on subordinating ostensibly less advanced non-Western cultures to Europeans. This had devastating consequences for African societies in particular, which were colonized while these ideas were at their height.

Events at the turn of the century weakened these certainties. Japan's emergence as an industrialized global power, for instance, called into question earlier assumptions regarding Asian societies, while the depraved behavior of Westerners in Joseph Conrad's *Heart of Darkness* (1899) gave the lie to notions of European cultural superiority. The Great War shook these ideas to their core. So far from being emblems of mastery, military machinery turned soldiers into neurotic, debilitated recipients of technological brutality. The upheaval spurred, inter alia, Hermann Hesse's explorations of Asian cultures for antidotes to Europe's spiritual deficiencies, and George Orwell's invective against what he called the "Pox Britanica" (p. 388). For colonized peoples who witnessed the carnage firsthand, moreover, the alleged virtues of European civilization appeared more fraudulent than ever. These misgivings did not, however, prompt Britain or France to abandon their empires, which had proven decisive to the Allied victory. What is more, civilizing ideology *gained* popularity in the United States, which remained comparatively unscarred by either of the world wars. This provided fertile ground for modernization theory, which emphasized the agency

and independence of non-Western societies in their transition to modernity, but nonetheless embodied a model of intervention as paternalistic and ethnocentric as its Victorian iteration. It has also proven ecologically and socially disastrous. As Adas observes in a new preface, although non-Westerners have exploded the disparaging assessments of earlier European writers, detrimental and discriminatory applications of science and technology persist: in, among other things, nuclear proliferation, fossil fuel pollution, and Westerners' insistence that formerly colonized peoples bear the economic brunt of climate change by reducing their ecological footprint. At the same time, Adas predicts, equitably devised scientific and technological solutions will also be indispensable to resolving these predicaments.

Several auxiliary lines of argument buttress these findings. Most controversially, Adas argues that European standards of scientific and technological comparison are largely informed by "cultural chauvinism" rather than racism (p. 12). While this is a useful distinction, it seems at times to hinge on assertions by Western authors taken at face value, when greater sensitivity to ideas that might underlie or even contradict published remarks is perhaps called for. The author also addresses the issue of causality in suggesting that machines became paramount benchmarks of comparison owing to the growing heft of the educated, socially mobile middle classes, highly involved in colonial administration, science, commerce, and missionary pursuits, and therefore deeply attuned to observable differences in technological capabilities. Nationality influenced Western outlooks as well, as evidenced by French tendencies to view science, rather than technology, as a barometer of aptitudes—a pattern explicable, Adas suggests, in light of the fact that France was less industrialized than Britain yet French science was more firmly institutionalized. Gender is less carefully explored here, as Adas himself concedes in the preface, though the book makes intermittent mention of the fact that reduced in-

tellectual capacities attributed to non-Westerners often paralleled prevailing misogynistic attitudes.

Machines as the Measure of Men occasionally shows its age. It would be difficult today to justify an interpretive undertaking of this scope, for instance, without giving greater attention to non-Western and indigenous critical perspectives. Such a move would surely advance the author's discussion of alternatives to the "ethnocentric vision" and "cultural imperialism" represented by modernization ideology (p. 415). The book also adopts something of a diffusionist framework for understanding the transmission of "European science and technology" to "non-Western peoples" (p. 5), in contrast to a now considerable literature that emphasizes the globally dispersed and often culturally heterogeneous production of science and innovation in imperial contexts.

These shortcomings, however, do not outweigh the book's most important virtue: its elegantly crafted, magisterial aggregation of case studies—from the likes of Karl Marx and William Jones to less recognizable figures like the Scottish novelist George Whyte-Melville—illustrating the sheer intransigence of Western technoscientific chauvinism across a broad range of political viewpoints. Alongside works more attentive to the perspectives of marginalized groups, *Machines as the Measure of Men* thus remains a worthy resource for confronting standards of cultural comparison that have so utterly shaped contemporary and historical disparities.

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