

The Rise of Early Modern Science: In China, Islam, and the West

By Toby Huff. Cambridge: Cambridge University Press, 1993, 409 + xiv pp.

The author has shown great courage in undertaking an endeavor that has daunted historians of science, intellectual historians, Islamicists, and Sinologists. Huff utilizes excellent sources and makes insightful hypotheses in this multidisciplinary work. If the book is not perfect, the failure is small compared to what he has achieved. Building on this work, other scholars will be able to sharpen the on-going debate and propose bold conclusions for years to come.

The Rise of Early Modern Science concentrates on why science "took off" in the West but not in China or the Islamic world, where it had much longer histories. By "takeoff," Huff means the explosion of scientific discovery that flowered in the West, especially during the early seventeenth century. His basic premise is succinct: "Modern science depends on the belief that the natural world is a rational and ordered world" and that "man is a rational creature who is able to understand and accurately describe the universe." Claiming that such Greek tenets never occurred in China and noting that the Arabs passed them on to Europe, he enumerates how they took hold in the West and facilitated the modern world.

Huff compares the legal systems of the three cultures as institutionalizations of their social, political, and intellectual experiences. While comparisons of their legal systems produce interesting results, contrasting their thought processes, educational systems, and practices of science could have shed more light on the differences in their utilization of scientific methodologies. His recourse to legal systems for comparisons in science is not successful, for law parallels scientific methodology in that both employ rigor, empiricism, and deduction. But *induction*, essential for science, was used in law mainly for purposes of legislation. His comparison of Islamic law with the West's fails because the former includes every aspect of life, whereas the latter is more limited to criminal, civil, and corporate aspects. China's law, on the other hand, is concerned with the social order.

Huff notes that China concentrated more on the organization of human society than on the natural environment. Emperors and their minions opposed searching for "truths" lest the established order be troubled. China did not codify or institutionalize its laws in ways comparable to Islam and the West. Given this history, China should be effectively out of

legal comparisons. The West's meager understanding of China's science and law also negate its inclusion for these comparisons. Needham, Huff's main source, did not claim to understand why China's science never took off, as compared to its technology, which did.

The author goes further than most intellectual historians in tracing the roots of science from the Greeks through the Islamic world to the West, but slights the role of the Persians in the link between Greece and the Islamic world and gives insufficient credit to Muslims for reintroducing into Europe Aristotle's *induction*, rigorous empiricism, experimental scientific methods, and sophisticated mathematics.

Although universities first arose in the Islamic world, Huff agrees with Makdisi that they became freer intellectually in the West because they were independent corporate entities and not under the power of rulers. Confusing science with the spirit of "inquiry," he claims that there was a great emphasis on "science" in European universities from the twelfth century on. To make this claim, he calls theology the "science of faith" and jurisprudence the "science of law." Huff includes printing and the Reformation's breakdown of restrictive central authority as elements in the West's proliferation of scientific activity, but ignores the riches stolen from the Americas, the discovery of the lens, industrialization, political pluralism, and other non-intellectual phenomena in the West's scientific takeoff.

Though most of the factors known to have inhibited the development of science in Islamic culture are noted, with religious dogma given too much weight, language is neglected. By extraordinary effort, Islam stretched the poetic Arabic of provincial Arabia to meet the concise and precise needs of communication for ruling a vast empire, establishing Islamic orthodoxy, and expressing complex ideas. Linguistic discipline stimulated intellectual ferment and the growth of science for over two centuries. However, emphasis on stylistic elegance, rhetoric, grammar, and aesthetics over logic and content eventually restricted Islam's intellectual and scientific creativity.

Huff cites the exclusion of nonreligious science from the *madrasah* curricula as proof of Islam's opposition to science. But in addition to scholars learning sciences privately—as he acknowledges—sciences, generative thinking processes, and rationalism were included in the curricula of institutions of learning, which were supported by religious foundations, until at least the fourteenth century—over two centuries after the take off of Islamic science effectively became somnolent. Muslim dogmatism may have limited scientific inquiry after its transmission to Europe and after intellectual curiosity had slowed in the East, but orthodoxy and the Shari'ah were only being established during the ninth to eleventh centuries, the period when science took off in Islamic culture. His discussion of factors affecting science's non-takeoff in China, only brief progress in Islam, and slow development in the West unduly plays down how traditional cultures seek to preserve the status quo and the roles of *deduction* and memorization versus generative thinking (especially *induction*, analogy, and metaphor).

In sum, two major shortcomings of the analysis are the lack of attention paid to the generative power of *inductive* reasoning in the open-ended search for natural truths so characteristic of the scientific enterprise and the role of Arabic in the decline of science in Islam. Islamic orthodoxy can be blamed for preventing a modern takeoff in science only by ignoring the proscientific religious admonitions such as “seek for knowledge, even unto China” and “the ink of scholars is more beloved by God than the blood of martyrs.” The existence over time of Muslim factions anxious to suppress the opened intellectual inquiry essential to science is the exception, not the rule.

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Book Review

*The Islamic Legacy of Islam: The Quranic
and Hadithic Foundations of the Muslim
World* by Dr. Muhammad Ali Hashim, Ph.D.
New York: Oxford University Press, 2015, 328 pp., \$35.00

Dr. Muhammad Ali Hashim's *The Islamic Legacy of Islam: The Quranic and Hadithic Foundations of the Muslim World* is a comprehensive and accessible work that explores the foundational texts of Islam. The book is divided into two main parts: the Quran and the Hadith. The author provides a detailed analysis of the Quranic text, discussing its structure, themes, and historical context. He also examines the Hadith, the sayings and actions of the Prophet Muhammad, and their role in shaping Islamic law and practice. The book is written in a clear and engaging style, making it an excellent resource for students and scholars alike.

The author's approach is both scholarly and accessible, providing a thorough understanding of the Islamic legacy. He discusses the historical and cultural context of the Quran and Hadith, and how they have influenced the Muslim world. The book is a valuable contribution to the study of Islam and its foundations. It is a must-read for anyone interested in the history and culture of the Muslim world.

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