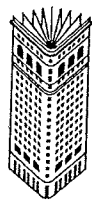


THE HOUSE OF  
WISDOM

*How the Arabs Transformed  
Western Civilization*

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## NOTE TO READERS

DEFINITIONS OF TERMS and concepts are rarely associated with works for the general reader, no matter how serious or weighty the subject, and I have deliberately kept these to a minimum. Nonetheless, a few words are in order at the outset about my choice of "Arab science"—or words to that effect—to convey the complex cultural milieu of the medieval Islamic world, rather than "Islamic science." As many readers will already be aware, much of the cultural flowering in this time and place was not exclusively the work of ethnic Arabs. Nor was it strictly the work of Muslims. Persians—including Zoroastrians and Christians—Jews, Greeks, Syriac Christians, Turks, Kurds, and others played crucial roles in all aspects of science, theology, and philosophy.

However, this work was almost always conducted in Arabic and frequently under the aegis of Arab rulers, most notably the Umayyad and Abbasid caliphs, first in Damascus and then in Baghdad. In one notable case, as we shall see, an ethnic Persian scholar produced a major work in his native language but then rewrote it in Arabic, which he found far more precise and more effective for his purposes. Throughout much of the period in question, Arabic served as the global language of scholarship, and learned men of all stripes could travel widely and hold serious and nuanced discussions in this *lingua franca*. Medieval Western scholars who wanted access to the latest findings also needed to master the Arabic tongue, or work from translations by those who had done so. It is also worth noting that such labels, today largely associated with nation-states and the demands for distinct cultural identity, were far more fluid in the era under discussion.

This is not to say that Islam and the unique culture of the Muslims are not important elements of our story. I refer to the great importance of Islam to the development of Arab science throughout the text and have devoted an entire chapter to this vital relationship between faith and reason. Yet much of the research during this period went well beyond specific questions relating to the Islamic faith and was not generally carried out with an eye to establishing

theological or doctrinal truths. At the same time, it is worth avoiding any confusion with the established notion of the "Islamic sciences," which generally refers to strictly religious disciplines: jurisprudence, Koranic exegesis, the study of the hadith, or the collected sayings of the Prophet Muhammad, and so on.

A few words on my use of names and dates and my system of transliteration will also be useful. This work presents the enormous impact of Arab learning on the West—that is, on the lands of medieval Christendom and the states and societies they later produced. It seemed only sensible to use the Latinized forms instead of the Arabic names in the case of figures widely known to the Western world. Thus, I have used the Latin Averroes, not the Arabic Ibn Rushd, and Avicenna, not Ibn Sina. Less familiar figures have retained their Arabic names. For similar reasons, dates are presented in the traditional "Western" fashion—that is, anno Domini (A.D.) and before Christ (B.C.) In transliterating, I have chosen readability, familiarity, and convention over linguistic purity or consistency.

Finally, a reference to the structure of *The House of Wisdom*, which pays tribute to the success of Arab scholars in measuring out the ever-changing pattern of night and day that determines the times of the five daily Muslim prayers. The book begins at sunset (*al-maghrib* prayer), the traditional start of the day in the Middle East; then moves through the nightfall (*al-isha*) of the Christian Middle Ages; recounts the dawn (*al-fajr*) of the great age of Arab learning; soars toward the glory of midday (*al-zubr*) with our central hero, Adelard of Bath, in the Near East; and concludes with the rich colors of afternoon (*al-ast*) that mark the end of the Age of Faith in the West and the seemingly unstoppable triumph of Reason.

*Prologue*

AL-MAGHRIB/SUNSET

FEW HAD ANY doubts that God had sent the earthquake to punish Antioch for its wanton and profligate ways. The residents of this Christian outpost not far from the eastern shores of the Mediterranean were notoriously corrupt and flouted their solemn obligations to God. "Certain men who hated fasting and loved lavish banquets, slaves to gluttony for enticing foods, were eager to copy the life and life-style not of those who lived well but those who ate well," scoffs Walter the Chancellor, a cleric and longtime Antioch functionary whose firsthand account of life in Antioch is dotted with references to Christian scripture and well-worn quotations from Ovid and Virgil.<sup>1</sup> The women reveled in scandalous, low-cut tunics and draped themselves in unseemly adornment. Some—"or so gossip has it," Walter says with a wink—even commissioned local artisans to have "coverings carefully made in Arab gold and a manifold of precious jewels for their shameful parts, not to clothe the appearance of their shame or to restrain the flame of lust, but so that that which was forbidden might inflame more hotly those people who did not desire legitimate pleasures."<sup>2</sup> Others prostituted themselves for sport, soliciting friends and neighbors alike from the town streets.

If a plague of locusts two years earlier had failed to stem this tide of dissolution among these Western newcomers to the Near East, then perhaps the very tremor of the earth would command the attention of the wayward populace. On November 13, 1114, an earthquake struck the outlying town of Mamistra, inflicting great damage and foreshadowing the destruction to come. Sixteen days later, "in the silence at the dead of night, when human frailty was accustomed more suitably and sweetly to sleep," Antioch itself felt the wrath of the Lord. "The city was a scene of destruction," Walter tells us, "with many killed in their homes. Others, indeed, were terrified; they abandoned their

homes, scorned their wealth, left everything, and behaved as if demented in the streets and squares of the town. They stretched their hands towards the heavens because of their manifold fear and powerlessness, and cried tearfully without ceasing in different languages: 'Spare us, Lord, spare your people.'"<sup>3</sup> The next morning, chastened survivors filed into the central St. Peter's Church, miraculously untouched by the violent swaying of the ground, and forswore the pursuit of earthly pleasure.

The Antiochenes were not the only ones to have their world turned upside down. Huddling for shelter on a stone bridge in Mamistra was a young country gentleman far from home. Adelard of Bath had not made the arduous journey from England's West Country for the celebrated wedding of King Baldwin of Jerusalem to Adelaide of Sicily. He was not interested in the debaucheries of his fellow Europeans. Nor had he followed in the footsteps of the conquering crusaders sixteen years before him to *Outremer*, literally "the lands beyond the sea." Unlike those fearsome holy warriors—that "race of Franks" unleashed by Pope Urban II—who had raped and pillaged their way across Central Europe even before they had gotten to the Holy Land, Adelard was determined to learn from the Muslims rather than kill them under the sign of the cross. Where the crusaders had seen only evil in the Muslim infidel, Adelard sought the light of Arab wisdom.

Antioch—today the provincial Turkish town of Antakya—must have been irresistible for the restless Adelard, who as a young scholar had already decreed the value of traveling far and wide in the pursuit of learning: "It will be worthwhile to approach teachers of different people, to commit to memory what you may find is most finely expressed among each of them. For what the French studies are ignorant of, those across the Alps will unlock; what you will not learn amongst the Latins, eloquent Greece will teach you."<sup>4</sup> The city, founded in the fourth century B.C., had once been the leading metropolis of Asia. Its memory was particularly dear to the Christian world: Here the name "Christian" had first been applied, and Saint Peter had served as the city's first bishop, a point the ever-touchy, status-conscious popes of Rome preferred to overlook.<sup>5</sup> It had once flourished under Muslim rule but was now controlled by crusading Normans. This new principality of Antioch comprised the fortified central town, the surrounding plain, and the seaports of Alexandretta and St. Simeon. The land was very rich, its fortunes resting on the manufacture of fine silks, carpets, pottery, and glass.

Like Adelard himself, the city that awaited him stood on the cusp between East and West. Antioch had long been an important stopover on the lucrative caravan trade route from Mesopotamia, traditional commerce that scrupulously ignored the inconvenient religious warfare of the Crusades and carried on much as before. Most of the city's inhabitants were Christians—Eastern Orthodox, Jacobites, Nestorians, and Armenians. The predominant language was Arabic, but religious and cultural affinities also ensured a place for Greek and Latin, creating a living Rosetta stone that eased the exchange of books and ideas across sectarian, cultural, and ethnic lines. Now, the principality found itself a vital link between opposing worlds, thrust together by the religious and political struggle for control of the holy city of Jerusalem, almost three hundred miles to the south.

A few years before Adelard's arrival, combined Norman and Genoese forces had captured the nearby city of Tripoli from the Banu Ammar, its refined Muslim princes. *The Damascus Chronicle of the Crusades*, a contemporary Arab account, recorded that among the booty carried off from Tripoli by the victorious Christians were "the books of its college and libraries of private collectors."<sup>6</sup> Thousands of these works ended up in the hands of Antioch's merchants, now within easy reach of the man from Bath.

Still, nothing had prepared Adelard for what he found in his dogged pursuit of what he called the *studia Arabum*, the learning of the Arabs. Here at last were the secrets of the ages, buried for six centuries beneath the chaos of western Christendom. This peripatetic Englishman immediately grasped the power of Arab knowledge to remake the world as he knew it. Adelard left his native England a young scholar thirsting for wisdom only the Arabs could supply. He would return as the first Western man of science and help change his world forever.

If, as Adelard now learned from his Arab teachers, the heavens moved to regular and immutable rhythms, then what role remained for God Almighty? Could he suspend these laws of nature? Did the universe have a beginning and an end, as written in the Bible and the Koran? Or was it eternal, neither created in time nor subject to change, as the Muslim philosophers said? If this "new logic" was correct, then what was one to make of the sacred teaching of creation? To Adelard, the world suddenly seemed a new and unfamiliar place. Such questions had engaged Arab thinkers for centuries, as they struggled to fit their own monotheistic faith into a growing understanding of the universe

around them. This great struggle between faith and reason was about to come crashing down on an unsuspecting Europe.

The arrival of Arab science and philosophy, the legacy of the pioneering Adelard and of those who hurried to follow his example, transmuted the backward West into a scientific and technological superpower. Like the elusive "elixir"—from the alchemists' *al-iksir*—for changing base metal into gold, Arab science altered medieval Christendom beyond recognition. For the first time in centuries, Europe's eyes opened to the world around it. This encounter with Arab science even restored the art of telling time, lost to the western Christians of the early Middle Ages. Without accurate control over clock and calendar, the rational organization of society was unthinkable. And so was the development of science, technology, and industry, as well as the liberation of man from the thrall of nature. Arab science and philosophy helped rescue the Christian world from ignorance and made possible the very idea of the West.

Yet how many among us today stop to acknowledge our enormous debt to the Arabs, let alone endeavor to repay it? How many recognize their invaluable bequest of much of our modern technical lexicon: from *azimuth* to *zenith*, from *algebra* to *zero*? Or the more mundane Arab influence in everything from the foods we eat—apricots, oranges, and artichokes, to name a few—to such common nautical terms as *admiral*, *sloop*, and *monsoon*? Even the quintessentially English tradition of the Morris folk dance is really a corruption of *Moorish* dancing, harkening back to a time when Arab minstrels entertained the nobility of Muslim Spain.

The names al-Khwarizmi, Avicenna, al-Idrisi, and Averroes—giants of Arab learning and dominant figures in medieval Europe for centuries—today invoke little if any response from the educated lay reader. Most are forgotten, little more than distant memories from a bygone era. Yet these were just a few of the players in an extraordinary Arab scientific and philosophical tradition that lies hidden under centuries of Western ignorance and outright anti-Muslim prejudice. A recent public opinion survey found that a majority of Americans see "little" or "nothing" to admire in Islam or the Muslim world.<sup>7</sup> But turn back the pages of time and it is impossible to envision Western civilization without the fruits of Arab science: al-Khwarizmi's art of algebra, the comprehensive medical teachings and philosophy of Avicenna, the lasting geography and cartography of al-Idrisi, or the rigorous rationalism of Averroes.

Even more important than any individual work was the Arabs' overall contribution that lies at the very heart of the contemporary West—the realization that science can grant man power over nature.

The power of Arab learning, championed by Adelard of Bath, refashioned Europe's intellectual landscape. Its reach extended into the sixteenth century and beyond, shaping the groundbreaking work of Copernicus and Galileo. This brought Christian Europe face-to-face with the fact that the sun—not the earthly home of God's creature, man—stood at the center of the universe. Averroes, the philosopher-judge from Muslim Spain, explained classical philosophy to the West and first introduced it to rationalist thought. Avicenna's *Canon of Medicine* remained a standard European text into the 1600s. Arab books on optics, chemistry, and geography were equally long-lived.

The West's willful forgetting of the Arab legacy began centuries ago, as anti-Muslim propaganda crafted in the shadow of the Crusades began to obscure any recognition of Arab culture's profound role in the development of modern science. This message comprised four central themes, a number of which still resonate today: Islam distorts the word of God; it is spread solely by violence; it perverts human sexuality, either by encouraging the practice of polygamy, as in the famed harems of the sultans, or through repressive or excessively prudish attitudes; and its prophet, Muhammad, was a charlatan, a tool of the Devil, or even the Antichrist.

The thirteenth-century philosopher Roger Bacon, one of the earliest Western proponents of the scientific method, praised the Muslims for their intellectual innovations, a subject he knew well: "Philosophy is drawn from the Muslims."<sup>8</sup> Yet the same Roger Bacon was just as enthusiastic in denouncing aspects of Muslim life of which he had no real knowledge or experience: The Arabs, he asserted confidently, "are absorbed in sensual pleasures because of their polygamy."<sup>9</sup> Soon such fanciful notions completely displaced all others in the popular imagination.

These views gained further currency in the Renaissance, when the West increasingly looked for inspiration to an idealized notion of classical Greece.<sup>10</sup> Eager to claim direct descent from the likes of Aristotle, Pythagoras, and Archimedes, Western thinkers deliberately marginalized the role of Arab learning. "I shall scarcely be persuaded that anything good can come from Arabia," wrote Petrarch, the most prominent of the early humanists, in the

fourteenth century.<sup>11</sup> Western historians of science have largely carried on in this vein; many cast the Arabs as benign but effectively neutral caretakers of Greek knowledge who did little or nothing to advance the work of the ancients.

Such accounts are grounded in the persistent notion of the West's "recovery" of classical learning, with the clear implication that this knowledge was somehow the natural birthright of Christian Europe and was merely misplaced during the Middle Ages. They are also profoundly colored by a Western consensus, often invoked to explain the state of the Muslim world today; that Islam is inherently hostile to innovation and became all the more so from the early twelfth century onward.<sup>12</sup>

PART I

Al-Isha/Nightfall

## NOTES

### Prologue: Al-Maghrib/Sunset

1. *Walter the Chancellor's The Antiochene Wars: A Translation and Commentary*, trans. and ed. Thomas S. Asbridge and Susan B. Edington (Brookfield, VT: Ashgate, 1999), 78.
2. *Ibid.*, 79.
3. *Ibid.*, 80–81.
4. *Adelard of Bath, Conversations with His Nephew: On the Same and the Different, Questions on Natural Science and On Birds*, trans. and ed. Charles Burnett (Cambridge: Cambridge University Press, 1998), 69–71.
5. Steven Runciman, *The First Crusade* (Cambridge: Cambridge University Press, 1980), 157.
6. Ibn al-Qalanisi, *The Damascus Chronicle of the Crusades*, trans. and ed. H. A. R. Gibb (Mineola, NY: Dover Publications, 2002), 89.
7. Geneive Abdo, "America's Muslims Aren't as Assimilated as You Think," *Washington Post*, Outlook sec., August 27, 2006.
8. Aziz S. Atiya, *Crusade, Commerce, and Culture* (Bloomington: Indiana University Press, 1962), 220.
9. Roger Bacon, *Opus Majus*, trans. Robert Belle Burke (Philadelphia: University of Pennsylvania Press, 1927), 815.
10. Brian Stock, "Science, Technology, and Economic Progress in the Early Middle Ages," in *Science in the Middle Ages*, ed. David C. Lindberg (Chicago: University of Chicago Press, 1978), 12.
11. Francesco Petrarca, *Letters of Old Age*, trans. Aldo S. Bernard, Saul Levin, and Reta A. Bernard (Baltimore: Johns Hopkins University Press, 1992), 2: 472.
12. In this view, salient geopolitical, environmental, and economic factors are generally ignored. For a thoughtful analysis of the decline of Muslim science and innovation, see Ahmad Y. al-Hassan, "Factors Behind the Decline of Islamic Science After the Sixteenth Century," in *Islam and the Challenge of Modernity: Historical and Contemporary Contexts*, ed. Sharifah Shifa Al-Attas (Kuala Lumpur: International Institute of Islamic Thought and Civilisation, 1996), 351–89. The notion that the faith was ultimately antithetical to science has come under increasing attack by historians of Islamic science. See the works of George Saliba, most recently, *Islamic Science and the Making of the European Renaissance* (Cambridge, MA: MIT Press, 2007); Roshdi Rashed; A. I. Sabra; and Ahmad Dallal.