H. Floris Cohen


In 2010, H. Floris Cohen published _How Modern Science Came into the World: Four Civilizations, One 17th-Century Breakthrough_ (Amsterdam University Press), an impressively large tome offering a comparative study of Ancient Greek, Chinese, Islamic, and European medieval and early modern investigations of nature. The volume under review is a compressed version of that work, addressed to a wider readership than professional historians of science. In reviewing the abridged version I consulted the longer version on a regular basis.

Throughout his narrative Floris Cohen adopts a neo-Aristotelian conception of historical development based on the transition from “latent development potential” to “actuality” (p. 44). This development followed a script that had a lesser or greater chance of becoming reality, though it was not determined to do so. Thus, in some respects, intellectual traditions are treated like acorns, which may potentially become oaks if they fall within the right terrain. The author, however, contends that this is not a perfect simile because there are also significant differences of teleological nature: in human affairs “the outcome is open” (p. 44), and intellectual traditions are also shaped and transformed by human agency and historical contingencies.

The book opens with two rich chapters comparing, first, investigations of nature in Ancient Greece and China, and then in the Islamic World and medieval Europe. After the Greeks stopped attributing most natural phenomena to the Gods, Floris Cohen identifies two main traditions, one flourishing in Athens, the other concentrated around Alexandria in the Hellenistic period. The former consists of four rival schools: Plato’s Academy, Aristotle’s Lyceum, the Stoa, and the garden of Epicurus. The author characterizes all these approaches as “natural philosophy,” relying on what their adherents claimed were self-evident first principles. The Alexandria school, including Euclid, Archimedes, Apollonius, and Hipparchus, among others, was especially strong in mathematics: it developed the notion of proof, and used mathematical disciplines in the study of music, the equilibrium of the balance and of fluids, optics, and astronomy. While both Athenian and Alexandrian traditions to some degree involved some investigation of nature, “their links with the actual natural world are extremely tenuous” (p. 17); therefore “[t]he empirical element was minimal: the thinking was abstract and theoretical” (p. 8).

The true golden age of Greek science ended with Hipparchus (ca 150 BCE); later developments, such as Ptolemy (second century CE), are characterized as “afterburners” (p. 26), following a pattern common to other cases. Thus, Floris
Cohen turns the question of decline on its head: rather than trying to explain it, he takes it for granted, because the conditions for a sustained body of investigations of nature were precarious and fragile from a political, intellectual, and theological point of view. Therefore, the question is rather what allowed intellectual transformations to continue unabated.

Moving on to China, Floris Cohen broadly identifies certain parallel chronological developments, but also some substantive contextual and intellectual differences. The period of the Warring States from the fifth to the third centuries BCE ended with the unification of China and the imperial period in 221 BCE. While the intellectual life in the former period was rich and varied, in the latter it became more rigid and less original; its main philosophical perspective has been characterized as “organic materialism” (p. 36). The relative lack of intellectual competition, of transplantations across different cultures, and thus of cross-fertilizations, marks a striking contrast to European and Middle Eastern developments, and goes a long way, as Floris Cohen argues, towards explaining the lack of intellectual revolutions in Chinese studies of nature, despite a number of impressive achievements.

With regard to the fortunes of Greek culture, the author identifies three waves of translations and enrichments: the first started under al-Mansur, who, in the third quarter of the eighth century, laid the foundations of the revival of Greek scholarship under Islamic rule, making of the new capital Baghdad its center. Under Islamic rule the “Athens” and “Alexandria traditions” were restored and enriched, especially in mathematics. By the eleventh century, however, this golden age was already in decline. This was due to political and patronage crises, as well as to religious influences that emphasized spiritual values over studies of nature. In its turn, the study of nature, was classed among the “foreign sciences” by Islamic philosophers. The sack of Baghdad in 1258 and the destruction of its library brought an end to its role as a center of learning, although other centers with notable “afterburners” could be found in Maragah under the Mongols, in the Ottoman Empire, and in Andalusia.

The second wave of translations followed the 1085 fall to Christian armies of Toledo, the Spanish city with its celebrated library that became a center of learning and translation from the Arabic with Gerard of Cremona. The recovery of Greek texts in Christian Europe involved both the “Athens” and “Alexandria traditions,” although Aristotle played a dominant role in natural philosophy. A creative synthesis of Aristotelianism and Christianity was forged by men like Albert the Great and Thomas Aquinas, while significant special developments occurred in several areas. Floris Cohen, however, identifies a steep decline in the investigation of nature following the death of Nicole Oresme (1320–1382), when Aristotelian philosophy gained an even more dominant role and ran