

Philosophy and Science in Andalusia

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Philosophy and science in Andalusia, Muslim Spain, had its origins in the East, in the cultures of ninth and tenth centuries Syria, Iraq, and Persia. It was there, beginning in the new Abbasid capitol of Baghdad, and spreading from there throughout *Dar al-Islam*, the Islamic World, that much of the Greek scientific legacy of late antiquity was translated and then assimilated into Arabic culture. A new body of knowledge soon arose, alongside the traditional Muslim sciences. These earlier *ulum al-din*, the religious sciences of Islam, consisted of Qur'an and hadith, Arabic grammar and linguistics, theology and law. The new sciences, mostly Greek in origin and foreign (i.e. secular) in spirit, included mathematics, physics, anatomy, biology, botany, chemistry, medicine, and astronomy.

Philosophy was an integral part of these natural sciences, its celestial physics, or metaphysics, regarded as the capstone of physics, even as its logic was the foundation for valid reasoning in every scientific discipline. The philosopher was more often than not also a scientist, expert usually in a number of areas, particularly logic, medicine, and astronomy. Moral and political philosophy also were part of the philosopher's charge, with which he described the ideal state and confronted the lesser realities of his society.

This entire philosophical and scientific corpus was transmitted westward in the ninth and tenth centuries, mostly by Andalusian scholars traveling East and returning home with the knowledge, and books, acquired in their travels. The Andalusian monarch 'Abd al-Rahman II (reigned 821-52) welcomed the new learning into the court at Cordova, where under later rulers a library was constructed; a pattern of royal patronage followed a century later in the various courts of the party states. Cities like Toledo, Seville, Saragossa and Granada became the centers of incipient universities, where the new sciences were taught, and from which translations were made into Latin for interested European scholars and rulers.

Astronomy and botany held an early and continuing fascination for Andalusian scientists and rulers, both for theoretical and practical purposes. Knowledge of the movements of the planets was thought vital to both rulers and commoners in designing their own plans. While farms and estates throughout the country benefited greatly from the research in agronomy and botany carried out in the royal gardens at Cordova (begun as early as the eighth century), Toledo and Seville (in the eleventh century). The botanists' work impacted directly also on the preparation of medical drugs and recipes, or simples, for treatment of diseases. A tradition of classifying plants and describing their uses, begun in antiquity with Dioscorides, was brought to culmination in the work of the thirteenth century Abdullah ibn al-Baytar, who considered some 3000 such simples.

Acting often as astrologers, the astronomers tried to affect human destiny, but with little success. Tangible results were to be had rather in the development of the astrolabe and other instruments for charting the heavens and mapping the earth. These instruments, and the maps and books of Andalusian science, can be viewed in the library of the Escorial Palace, outside Madrid. Built after the Reconquista by Philip II (d. 1598), it contains something like two thousand volumes of Andalusian science and philosophy.

Advances in mathematical knowledge, particularly in trigonometry, gave some astronomers in the twelfth century, notably Nur al Din al-Bitruji, the courage to challenge the dominance of Ptolemaic astronomy. Al-Bitruji thought he could supplant the irregular pattern of Ptolemy's spheres with Aristotle's original scheme of concentric motion. He wished thereby to restore the earth to the center of the universe, conforming better to entrenched physical and theological models of perfection.

Al-Bitruji's action bespoke a confidence felt by many Andalusian scientists, who were equals of their Eastern brethren by the eleventh century, and their superiors in philosophy by the twelfth century. The earliest known Andalusian philosophers, however, were Ibn Masarra in the tenth century and Solomon Ibn Gabirol in the eleventh century, both influential in later mystical movements in the Muslim and Jewish communities, respectively. Aristotelian teachings competed philosophically with the platonically oriented works of late antiquity. Such neo-Platonic motifs were expressed in the twelfth century in the writings of Ibn Bajjah and Ibn Tufayl. Both men sought to chart the path towards which ultimate happiness lay, by using knowledge of the truth to join the divine realm. As this truth did not entail traditional Muslim doctrines necessarily, both men knew their teaching were not welcome to all. The hero of Ibn Tufayl's fictional novel, Hayy ibn Yaqzan, tries to impart his scientific and philosophical teaching to others, but is forced to realize people are not interested in them. He returns to be a recluse on his island, despairing of improving society.

The somewhat younger 12th c. Moses Maimonides and Abu l Walid ibn Rushd share this negative view of the intellectual level of their compatriots, respectively Jewish and Muslim. But both philosophers (arguably the greatest philosophers in each community, as well as outstanding experts in both religious law and medicine) are determined to present their views to the philosophers among their brethren, even if required to dissemble their views. Ibn Rushd was fortunate to have the support of the Almohad ruler Abu Ya qub Yusuf for most of his life, being asked by the Caliph in 1169 to write commentaries on nearly all of Aristotle's work. Besides writing some thirty-eight such commentaries, Ibn Rushd defended Aristotelian physics and metaphysics from earlier neo-Platonic and theological distortions, as he saw them, of both Avicenna and Al-Ghazali. The philosophical and theological future lay with these two men and their Eastern followers. Philosophy, however, declined in

Andalusia in the following century. Science followed suit more gradually, the Kingdom of Granada maintaining a scientific presence until the end of the fifteenth century.

Suggested Readings:

D. C. Lindberg, The Beginnings of Western Science (Chicago and London, 1992), pp. 161- 82, 261-67.

I. Sabra, The Andalusian revolt against Ptolemaic astronomy: Averroes and al-Bitruji, Transformation and Tradition in the Sciences, ed. Everett Mendelsohn (Cambridge, 1984), pp. 133-53.

Majid Fakhry, A History of Islamic Philosophy (New York, 1970), pp. 287-325.