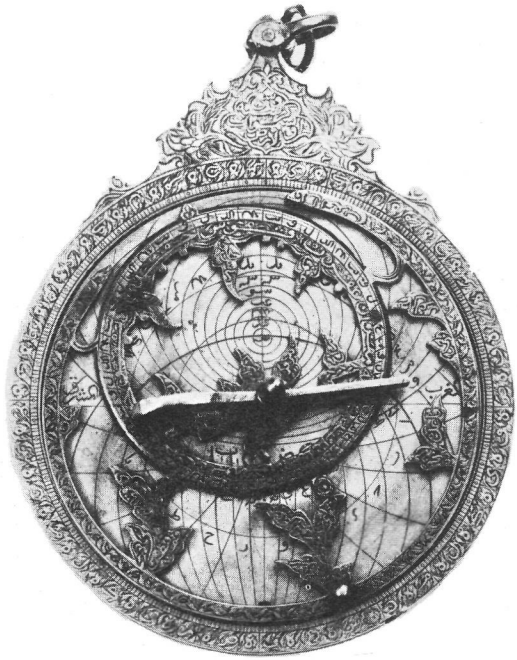
Project for the History of Astronomy and Astrology

David Pingree

Astrology and astronomy were, historically, two of man's most readily transmitted sciences—or at least, because of their mathematical expressions, the two whose transmission from one culture to another and whose transformations and developments in the course of transmission are most easily traced. The project for the history of these two sciences has been primarily concerned with the investigation of certain key areas in the course of this process of transmission, transformation, and development: the Hellenistic and Roman Imperial periods in the eastern Mediterranean, India from the Mauryan period to the present, Sasanian Iran, the Islamic lands under the ᶜAbbasid Caliphs, and Comnenan and Palaeologan Byzantium.

In approaching each of these areas the first and basic task has been the editing of texts (almost all of the relevant ones have not hitherto been published) and the cataloguing of manuscripts. The editions, when it has seemed appropriate, have been accompanied by translations and commentaries which attempt not only to explain the technical details in the texts, but to relate them historically to their sources and to the subsequent traditions of which they form a part of the foundation.

My study of Greek and Babylonian influence on Indian science has been inaugurated by editions of the *Yavanajâtaka* of Sphujidhvaja (A.D. 270) and, with O. Neugebauer, of the *Pañcasiddhântikâ* of Varâhamihira (*ca.* A.D. 550). Further undertakings have been a *Census*



Brass astrolabe (*ca.* 3⅛ in. diameter) constructed by ᶜAbd al-Aʾimma in Iran between A.D. 1668 and 1720. *Photo by Ursula W. Schneider*

of the Exact Sciences in Sanskrit, of which the first of a projected ten volumes has just appeared; detailed analyses of Sanskrit manuscripts containing astronomical tables in the United States and in England; and editions of several Sanskrit astrological texts. In the field of ancient Greek science my principal project has been the attempt to reconstruct the lost astrological poem composed by Dorotheus of Sidon (*ca.* A.D. 50–75). This reconstruction depends primarily on an edition of the Arabic translation, probably by ᶜUmar ibn al-Farrukhân al-Ṭabarî (*ca.* A.D. 800), of the lost Pahlavî version (*ca.* A.D. 275) of Dorotheus, and on an edition of the *Apotelesmatica* of Hephaestio of Thebes (*ca.* A.D. 415), wherein many of Dorotheus' verses are quoted or paraphrased. For Sasanian Iran our main sources of information are the Arabic texts of the ᶜAbbasid period, and a number of these have now been explored in a series of books and

articles: al-Fazârî (*ca.* A.D. 760–790), his contemporaries Yaʿqûb ibn Ṭâriq and Mâshâʾallâh, Abû Maʿshar (A.D. 787–886), and al-Hâshimî (*ca.* A.D. 870). The studies of Mâshâʾallâh and of al-Hâshimî have been done in collaboration with E. S. Kennedy. Finally, the Arabic influence on late Byzantine science has been approached through the Greek translation (*ca.* A.D. 1000) of an astrological treatise by Abû Maʿshar, the translations of several Arabic *zîje*'s or sets of astronomical tables by Gregory Chioniades (A.D. 1290–1302), and the works of the astrological school of John Abramius (*ca.* A.D. 1370–1410).

The enquiry, then, while progressing, is still in its first stages and will remain there for some time. Eventually more complex questions may be asked: What factors foster the transmission of science from one cultural area to another? How is the information to be transmitted selected? In what ways must the selected information be transformed in order for it to gain acceptance in an alien culture? And, to what extent does the transformation affect the validity of the scientific information transmitted? Certain tentative answers to these and other questions have begun to emerge out of the examination of the particular historical cases, but many more examples are needed before any but the most trivial generalizations can, if ever, be made.