to which these tables deriving from mathematical procedures were used before the thirteenth century is unknown; the earliest examples are contained in technical works which must have had fairly limited circulation. The muezzins certainly had no need of them. One had to be an astronomer, for they had to be used together with some kind of observational instrument for measuring the sun's altitude and reckoning the passage of time.

It was not until the thirteenth century that the institution of the *muwallid* appeared in mosques and madrasas. These professional astronomers associated with a religious institution not only regulated the prayer-times, but constructed instruments, wrote treatises on spherical astronomy, and gave instruction to students. In thirteenth-century Cairo, new tables were compiled which set the tone for astronomical time-keeping all over the Islamic world in the centuries that followed. In medieval Cairo there was a corpus of some 200 pages of tables available for time-keeping by the sun and for regulating the times of prayer (see figure 5).