PREFACE

The need for the present tables became pressing several years ago when hundreds of astronomical cuneiform tablets in the British Museum became available for study, partly through the copies made in the 1880's and 1890's by Father J. N. Strassmaier and T. G. Pinches, partly through a systematic investigation of the collection by A. J. Sachs during two extended stays in London.

All these texts originally came from some archive in Babylon which was discovered by Arabs (who were really hunting for ancient oven-baked bricks which could be sold at a profit) in the middle of the nineteenth century.[1] Most of the texts were written during the Macedonian and Parthian occupation of Mesopotamia, from about 330 B.C. to the first century A.D. The number of similar texts from the preceding Late Assyrian, Neo-Babylonian, and Old-Persian periods is much smaller, but this very paucity makes it all the more desirable to extract the maximum possible information from these earliest sources for our knowledge of Babylonian astronomy.

Many of the texts are fragments of the original clay tablets which have broken in the course of time. In many cases, a fragment contains only parts of a few legible lines. Since, however, much of the information is of an astronomical character, it is quite often possible either to date a fragment exactly or at least to restrict its date to a very few possibilities. For example, a given combination of positions of Saturn and Jupiter can only occur about sixty years apart since Saturn has a sidereal period of about thirty years, Jupiter of twelve years. Some additional information, e.g., about the date of first or last visibility of a planet or about its distance from a fixed star, then frequently makes it possible to reject all but one of the possible dates. Comparison with other fragments of already established date in turn often leads to "joins" of separated pieces, and thus one slowly restores a broken larger tablet. This, then, will usually lead to additional information in a larger context, e.g., involving the moon, which in turn allows a determination of the exact day of the astronomical event in question.

[1] A. Sachs, A classification of the Babylonian astronomical tablets of the Seleucid period, *Jour. Cuneiform Studies* 2: 271–290, 1950. Furthermore, *Late Babylonian astronomical and related texts copied by T. G. Pinches and J. N. Strassmaier*, prepared for publication by A. J. Sachs, Brown University Press, Providence, 1955.

It is evident that for investigations of this type the possibility of rapid scanning of accurately dated planetary positions is of primary importance. It was with this in view that the present tables were developed by Dr. B. Tuckerman in consultation with Professor A. Sachs, Dr. H. H. Goldstine, and myself. The project originated at the Institute for Advanced Study in Princeton, and was continued and successfully concluded under the auspices of the International Business Machines Corporation after the closing down of the computer in Princeton. We are greatly indebted to both institutions for having made the execution of this project possible in so generous a fashion.

The usefulness of the present tables is, of course, not restricted to the investigation of Babylonian astronomy. The checking of any ancient record involving planetary and lunar positions during the last six centuries B.C. can now easily be executed with, at the most, a small correction for geographical differences—which will often be below the inaccuracy of the ancient record. Nevertheless, one can hardly expect that sources will become available of greater significance than the almost continuous records of the cuneiform texts for the last centuries before our era. Their significance reaches far beyond an insight into the early development of astronomy. The recovery of great masses of detailed eclipse records, accurate data for phenomena like occultations, etc., will eventually give reliable early elements for the testing of empirical constants related to the problem of secular acceleration.

The possibility of accurate dating of month-by-month recorded meteorological remarks (clouds, storms, floods, and river level) will place the discussion of climatic changes in ancient Mesopotamia on a solid foundation. Quotations of prices, references to epidemics, to historical and military events, etc., are contemporary records which can be dated precisely, thanks to the astronomical context in which they are embedded.

The exacting work of slowly restoring a huge archive of well over a thousand texts to its full usefulness for the astronomer as well as for the historian of astronomy and the historian of the Hellenistic age is being carried out in all its aspects, philologically, historically, and astronomically, by Professor A. Sachs. The present tables are a most valuable tool for this work and will remain so for all future evaluation of the new evidence now becoming available.

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