In memoriam
Asger Hartvig Aaboe
(26 April 1922 – 19 January 2007)

Asger Aaboe, Professor Emeritus of History of Science, of Mathematics, and of Near Eastern Languages and Literatures at Yale, died at his home in North Haven, Connecticut on January 19, 2007 after a brief illness. He was 84 years old.

Asger was born in Copenhagen in 1922. His father was an army officer whose family came from Egaa ('Oak Brook'), a village north of Aarhus; and, as Asger once explained, his family name means 'one who lives by (boe) the brook (aa)'. He graduated from the Østre Borgerdydskolen gymnasium, once presided over by the classicist J. L. Heiberg (1854–1928), and entered the University of Copenhagen in 1940, the same year as the German invasion of Denmark. There he studied mathematics, astronomy, physics, and chemistry; and was especially influenced by the mathematician Harald Bohr, brother of Niels and uncle of Aage, Asger's friend and classmate.

In 1947 he earned the equivalent of a Masters degree (Candidatus Magisterii) with the historical thesis 'The Determination of Areas and Volumes in Antiquity, Especially in the Works of Archimedes'. The following year, he held a Visiting Lectureship at Washington University in St. Louis, where he met his first wife Joan Armstrong, whom he married in 1950 and who died in 1990. Returning to Denmark in 1948, he was 'Adjunkt' in Mathematics at Birkerød Statsskole until 1952, when he came again and permanently to the U.S. as an Instructor in Mathematics at Tufts University.

In 1955 Asger became the sole graduate student at the time in the History of Mathematics Department at Brown, where he commenced a long and close association with Otto Neugebauer and Abraham Sachs, earning his Ph.D. in 1957 with the dissertation 'On Babylonian Planetary Theories'. Tufts made him Associate Professor in 1959, and in 1961 he was invited to Yale by Derek Price as a Visiting Associate Professor in the newly formed Department of the History of Science and Medicine. In 1962 he received joint appointments as Associate Professor with tenure in the History of Science and Medicine and the Mathematics Departments. He became a full Professor in both departments in 1967, and additionally in the Department of

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Near Eastern Languages and Literatures in 1977. From 1970 to 1980, he was President of the Connecticut Academy of Arts and Sciences and in 1975 was elected a Foreign Member of the Royal Danish Academy of Sciences and Letters (which published several of his most significant papers as handsomely produced monographs). He retired in 1992 and married Izabela Zbikowska in 2006. He is survived by his widow, Izabela, four children from his former marriage (Kirsten, Anne, Erik, and Niels) and twin grandsons (Samuel and Tyler).

Asger's scholarship included 37 technical papers and reviews, several of which concerned Greek and Babylonian mathematics as well as topics pertaining to Greek astronomy. However, his primary focus and achievement was expanding our understanding of Babylonian mathematical astronomy. Though a late-comer to Assyriology, he added roughly 50 published texts dealing with mathematical astronomy—many relating uniquely to its development—to the 300 or so published by Neugebauer in his *Astronomical Cuneiform Texts*, making many joins on visits to the 'Students Room' at the British Museum in the process. His editions of these texts were invariably accurate and accompanied by exquisite hand-drawn tables which set an exceptional aesthetic standard.

One of his most significant papers appeared in 1964: entitled 'On Period Relations in Babylonian Astronomy' [*Centaurus* 10:213–231], it describes the fundamental connection between period relations and the most powerful of the Babylonian techniques for depicting variations dependent on zodiacal longitude. Known as System A and widely encountered in both lunar and planetary theories, this technique had been described by Neugebauer and others in ways that were mathematically accurate, but awkward to work with and difficult to recognize as 'Babylonian in manner' as Asger put it in a subsequent comment. The essential insight of the paper was that any variation which was a function of longitude and which recurred after Π events and Z zodiacal revolutions, must occur at Π distinct positions separated by a like number of intervals, Z of which comprise a single event, and that simply varying the length of such intervals resulted in the powerful System A methodology. In addition to seeming much closer to a Babylonian framing of the problem, this insight greatly facilitated the analysis of System A procedures, and virtually all subsequent work on this technique is indebted to it.

A second, and even more significant, contribution was a series of four papers published from 1968 to 1979 (the last with N. T. Hamilton), which addressed a central unresolved issue of Babylonian lunar theory. In lunar ephemerides classified as belonging to System A, it had long been understood that the function denoted as column Φ served as an effective argument of anomaly in computing the variation due to lunar anomaly in the length of one month. Nevertheless, its physical significance had remained obscure, as had the motivation for its role in the theory. In the first paper of this series, Asger published a key text which identified Λ, as depicting the variation due to lunar anomaly in 12 months and showed that Φ depicted the variation due to lunar anomaly of 223 months, confirming with textual evidence an earlier conjecture briefly proposed by van der Waerden. Thus, for the first time in the 70 years following its discovery by Kugler was the physical significance of Φ securely established. The three following papers published new textual evidence and expanded on this discovery, culminating in the decipherment and description of a similar scheme for the variation of six months in the last paper of the series. Together the four papers securely identified for the first time the principal component schemes of the System A theory of lunar anomaly and their arithmetical relationships, transforming our understanding of this elegant and powerful theory.

In the midst of this series, a paper published in 1975 with Jan Henderson on the treatment of lunar latitude, and regarded by Asger as one of his most satisfying, substantially clarified a complex and hitherto murky component of the System A lunar theory, exhibiting in the process—again for the first time—the fundamental period relation governing nodal elongation. While difficulties still attend our understanding of this element of the theory, this paper remains the starting point for future investigations.

These papers and their accompanying new textual materials are only the most conspicuous of Asger's contributions to our understanding of Babylonian astronomy and mathematics. In addition he published two books, directed towards a student readership, which explore in appropriate depth and with a mathematician's sensibility exemplary episodes in the history of ancient mathematics and astronomy. The first, *Episodes from the Early History of Mathematics*, published in 1964 and still in print in several languages, provides an elegant introduction to Babylonian and Greek mathematics, as well

as to Archimedes and Ptolemy among other topics. Its companion volume, *Episodes from the Early History of Astronomy*, published in 2001, is actually a concise survey, lucidly written with original demonstrations, of the main developments in planetary theory from the Babylonians to Kepler.

Like many of his compatriots, Asger wrote English in a distinctively clear and fluid style, accompanying his commentaries with beautiful hand-drawn tables and diagrams unmatched in contemporary machine prepared copy. In a field where understanding is stitched together from fragmentary bits of evidence and subject to frequent revision with the decipherment of each new tablet, his contributions are distinguished by the robustness with which they have withstood such revision as new facts have emerged.

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