In Memoriam

Asger Aaboe
(1922–2007)

Asger Hartvig Aaboe died at his home in North Haven, Connecticut on 19 January 2007 at the age of 84 years. Born in Copenhagen, Denmark, on 26 April 1922, Aaboe moved to the United States in 1952 and spent most of his professional life as a member of the Department of History of Science and Medicine at Yale, retiring in 1992 as Professor of History of Science, of Mathematics, and of Near Eastern Languages and Literatures. He was married twice, first to Joan Armstrong in 1950 with whom he had four children and who died in 1990, and in 2006 to Izabela Zbikowska. He is survived by his widow, Izabela, his children Kirsten, Anne, Erik and Niels, and his grandsons Samuel and Tyler.

Aaboe graduated in 1947 from the University of Copenhagen with the degree of Candidatus Magisterii, comparable to a Masters degree. His studies included not only astronomy and mathematics but also the preparation of a thesis on the determination of areas and volumes in the works of Archimedes and other ancient Greek authors. Following the completion of his degree Aaboe taught mathematics at Washington University in St. Louis (Missouri), at Birkerød Statsskole back in Denmark, before moving permanently to the United States in 1952 to take up a position as Instructor in Mathematics at Tufts University. While at Tufts, Aaboe began to study for a PhD under Otto Neugebauer at Brown University.

Few combinations of student and supervisor can have been as profitable as that between Neugebauer and Aaboe. When Aaboe first came to Brown, Neugebauer was in the final stages of preparing his groundbreaking study of Babylonian mathematical astronomy, *Astronomical Cuneiform Texts* (1955). This work would put research into Babylonian astronomy on a firm foundation through the publication and systematic analysis of more than three hundred texts found on cuneiform tablets held in the British Museum, the Oriental Institute at Chicago, the Louvre in Paris, the
Staatliche Museen in Berlin, the Arkeoloji Müzeleri in Instanbul, and several smaller collections in Europe and the United States. It was natural, therefore, that Aaboe would work on Babylonian astronomy for his PhD. His dissertation, “On Babylonian Planetary Theories”, was published in *Centaurus* 5 (1958) 209–277.

At Brown, Aaboe also met the Assyriologist Abraham Sachs, who had worked with Neugebauer on the study of Babylonian mathematical texts but had now turned his attention to Babylonian astronomy. Sachs had been given access to many hundreds of copies of astronomical cuneiform tablets in the British Museum that had been drawn in the late nineteenth century by T.G. Pinches and J.N. Strassmaier (Sachs published these in *Late Babylonian Astronomical and Related Texts* (1955)) and had also started to search through the British Museum’s holdings for more astronomical tablets. Sachs passed on to Aaboe a list of tablets that were clearly related to the mathematical astronomical texts published by Neugebauer but did not appear to be part of the known systems of planetary or lunar theory. This list of tablets would provide the stimulus for much of Aaboe’s research for the rest of his career.

Following his appointment at Yale in 1961, Aaboe wrote the first of his two books. *Episodes from the Early History of Mathematics* (1964) was published by Random House in their New Mathematical Library series aimed at improving the teaching of mathematics in schools in the United States. Aaboe took this opportunity to write a history of mathematics text that was accessible to school-children and yet still dealt with the technical details of ancient mathematics. In carrying off this challenge Aaboe displayed his gift for explaining complicated matters in clear, charming, and witty prose. His success can be seen by the fact that the book has been translated into Swedish, Danish, Spanish, Turkish, Polish and Japanese, and remains in print today. Aaboe’s use of “episodes” to teach the history of science was evidently a successful model (in *Episodes from the Early History of Mathematics* he chose Babylonian mathematics, Euclid, Archimedes, and Ptolemy’s table of chords as his subjects), and in 2001 he published a sequel: *Episodes from the Early History of Astronomy*. This time the episodes were Babylonian astronomy, Greek geometrical planetary models, Ptolemy’s cosmology, and Kepler motion viewed from either focus. In addition, the book contains a “chapter 0” entitled “What every young person ought to know about naked-eye astronomy”, an elegant description of the phenomena and motions in the night sky. This beautifully written chapter has turned out to be of great use in introducing the night sky to students in my own teaching.

In between writing his two *Episodes* books, Aaboe published more than twenty technical papers on ancient astronomy and mathematics. Their subjects range from Seleucid Babylonian tables of extended reciprocals and squares of regular numbers, qualitative measurement in antiquity (with D.J. de Solla Price), and the theoretical treatment of eclipses in antiquity. Most of his publications, however, concern lunar and planetary theory in Babylonian mathematical astronomy. Of particular note is his “On Period Relations in Babylonian Astronomy”, *Centaurus* 10 (1964) 213–231, which sets out a “Babylonian” understanding of how period relations are constructed and can be used; previously Neugebauer had only explained period relations using the language of modern mathematics. Also of great importance is a series of four linked papers (the last written jointly with N.T. Hamilton) on Babylonian lunar theory published in *Det Kongelige Danske Videnskabelernes Selskab Matematisk-fysiske Meddelelser* between 1968 and 1979. In these papers Aaboe uncovered the meaning and purpose of an enigmatic function within Babylonian System A lunar theory known as column Φ. Column Φ was identified by Kugler in 1900 and it was known that column G, which gives a first approximation of the length of the synodic month taking into account only lunar anomaly, was calculated from Φ. However, Aaboe, through a groundbreaking analysis of the Φ–G tables published in Neugebauer’s *Astronomical Cuneiform Texts*, and several tablets in the British Museum contained in Sachs’ list, showed for the first time how the Φ–G relationship had been constructed. He also demonstrated that when the zigzag function of column Φ is capped at certain upper and lower limits it represents the variable excess in length of 223 synodic months (a period known as the Saros) over a whole number of days, on the assumption that the solar velocity is at its maximum value of 30 degrees per month. Aaboe went on to show that there were other functions similar to G that represented first approximations to the length of 6 synodic months and 12 synodic months again taking into account only the variation in lunar anomaly, and published textual evidence for their existence. In one remarkable piece of textual detective work, Aaboe showed that the tiny fragment BM 42685, published by Neugebauer as ACT No. 207i contains a series of Φ-values at twelve-month intervals of which only the last three digits of each number are preserved. Aaboe jokingly wrote to Neugebauer enquiring how on Earth he could have failed to spot this!

Despite his retirement in 1992, Aaboe maintained his interest in Babylonian astronomy, continuing to publish important studies, and encouraging younger scholars in their work. I was fortunate to be one of the beneficiaries of Asger’s encouragement, and spent several happy days staying with him in North Haven, discussing Babylonian astronomy, eating his fine home made bread, sailing on his boat, and listening to his stories of Sachs, Neugebauer.
and the other great scholars of Babylonian astronomy. I am honoured that his final publication, on an inconsistency in the Babylonian system B lunar theory, appeared in a volume I jointly edited with Annette Imhausen. Indeed, Asger had intended to present that paper at a conference organised by Annette, Christopher Walker and myself at the British Museum in June 2001, but unfortunately was unable to attend due to ill health. Nevertheless, he sent a written version of his paper, accompanied by the remark that he would have prefaced the paper with some ‘poetry’ on Babylonian lunar theory, and the request that his former student and great friend John Britton should read the paper for him, a task he took up admirably.

A festschrift in honour of Aaboe containing papers written by friends, colleagues and former students was published in 1987 under the title *From Ancient Omens to Statistical Mechanics: Essays on the Exact Sciences Presented to Asger Aaboe*, edited by J.L. Berggren and B.R. Goldstein. A list of Aaboe’s publications up to 1980 is given on pages xvii–xix of that book. A complete list of publications may be found in J.L. Berggren’s obituary of Aaboe in *Centaurus* 49 (2007) 172–177.

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