

SAW Three-Month Workshop:

Mathematical Practices in relation to the Astral Sciences

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Procedures in Late Babylonian mathematical texts from Uruk: conversions, arithmetical and geometrical progressions

Abstract: After the two previous presentations (5/1/2015 and 20/2/2015) on mathematical tablets from Achaemenid Uruk, this presentation focuses on a mathematical tablet from Hellenistic Uruk, preserved in the Louvre Museum under the number AO 6584. The tablet, one of the best known mathematical documents from late periods, contains 18 problems on various topics. According to its colophon, the text was written by Anu-ab-uter, the most prominent astronomer of the great temple of Hellenistic Uruk.

The first two problems deal with progressions (the sum of the terms of a geometrical progression, and the sum of the squares of the ten first integers) and open the discussion on the way in which a scribe, besides being involved in mathematical astronomy, worked on structured set of numbers.

The following problems focus on the calculation of surfaces (triangles and rectangles) and volumes of cubes. These calculations use the ancient tools and metrology inherited from the Old Babylonian traditions which flourished more than one millennium before, in southern Mesopotamia. The new metrology used in the Hellenistic period in administrative and economic contexts is also present in the mathematical text. The surfaces are expressed both in old and new metrologies via coefficients. AO 6584 shows how several mathematical traditions are mixed.

The four last problems on “*igi-igibū*” (find two numbers knowing that the one is the reciprocal of the other and their sum) are quadratic problems which show another aspect of the transmission of ancient mathematical traditions which were transmitted from the Old Babylonian period. However, new approaches can be observed: the technical vocabulary eliminates geometrical connotations, and the choice of the data shows a predilection for many place value numbers.

As elements of conclusion, the following points can be noted.

Mathematical texts dated to the Hellenistic period seem to have much more connections with astral sciences than those dated to the Achaemenid period.

Metrological systems, correspondences with SPVN, conversions with coefficients, notations, show a striking variety of practices, including in the same text. Chronological, geographical, and genre contrasts in metrology can be observed: OB / LB; Achaemenid / Seleucid; Uruk / Babylon; mathematics / astronomy / economy.