6. 'Anbî's terminology.

b^3 in cube root. Analogously in the square root operation, $2ab$ and b^2 are not reckoned separately but as one term $(2a+b)\,b$.

There is as yet no substantial evidence that ibn Labbān influenced his immediate successor mathematicians except through his student, al-Nasawī. However, it is important that the processes he used are very close to those used today so that ibn Labbān was certainly a transmitter of ancient arithmetic as well as a probable innovator in the improvement of the methods of arithmetic calculation.

Ibn Labbān's debt to the Indians, however, is clear from an early paragraph where he states, " Here I write what is necessary to establish for the general need and Hindu arithmetic, according to astronomy and according to other disciplines in the manner in which the general public uses it, whether according to the discipline as used for whole numbers or whether according to the general public's use in making change, or whatever number it is, or the general public's use for fractions refined in studies or the counted change, and for small change until he reaches the division of the numerical remainder, and for the division of the remainder of the remainder until all that is written of our statements comprises twelve chapters."

6. 'Anābî's terminology.

The Hebrew terminology is of interest since mathematicians and translators were still having difficulty in making up new termini technici even at the late date of the fifteenth century. 'Anābî's commentary, however, tries to elaborate on the new terms brought into the discussions. *Jadr* or *jadhr* in Arabic is equated to the Hebrew *shōresh*. Nowhere, however, does the commentator or ibn Labbān indicate the true understanding of the original meaning of this term as al-Khwārizmī, for example, knew it [27]. This is shown in an elementary explanation of 'Anābî.

" When he (ibn Labbān) says *jadhr*, he refers to that multiplied number or divided number, whichever it is. The example is 5 which is a root when it is either multiplied by itself, when we say 5×5, or multiplied by something other than itself, and in the case of division." [28]

Terms of interest include *nelām*, " to record a symbol ". It is so " because in Arabic *alama* is equivalent to *rōshem*, a sign.

The Arabic *tanṣīf*, " duplation ", is called in Hebrew *dōmeh*. The fractional portion or remainder of the quotient in Judaeo-Arabic is *alqūshūr*, in Hebrew *yitrōn*. The integral part of the quotient is in Judaeo-Arabic *sīkhakh*. The square root is *jadr* in Judaeo-Arabic, *jadhr* in Arabic, and in Hebrew *shōresh*.

In determining the square and cube roots, every second or third numeral of the number is marked off. In the case of the square root, the first numeral on the right and all of its alternates are called in Hebrew *medaberet*, in Judaeo-Arabic *minṭakh*; the next one and its alternates are called *elemet* in Hebrew, in Judaeo-Arabic *asā*. *Yitrōn ha-yitrōn* is the remainder of the remainder.

7. Arabic text.

The Hebrew commentary was compared and checked with ibn Labbān's Arabic text after the former had been studied. It is planned to publish a completely collated version of these two manuscripts. The text was found in the Aya Sofya Library in Istanbul (number 4857).

NOTES AND REFERENCES

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[2] Aldo Mieli, " La Science Arabe " (Leiden, 1938), p. 108.

[3] J. Lelewel, " Géographie du Moyen Age " (Bruxelles, 1852-7), I, XLVIII, III;

A. Mieli, *op. cit.*, 21; P. Luckey, " Die Rechenkunst bei Gamsīd b. Mas'ūd al-Kašī " (Wiesbaden, 1951), p. 73;

H. Suter, Die math. u. astron. d. Araber in *Abh. z. Gesch. d. math. Wiss.*, 10, 83-84 (1910); Nachträge Vol. 14, 168; C. Schoy, *Isis V*, 395;

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