

Zeitschrift:	L'Enseignement Mathématique
Herausgeber:	Commission Internationale de l'Enseignement Mathématique
Band:	8 (1962)
Heft:	1-2: L'ENSEIGNEMENT MATHÉMATIQUE
 Artikel:	MODERN FUNDAMENTAL OPERATIONS IN AN EARLY ARABIC FORM: 'ANAB'S HEBREW COMMENTARY ON IBN LABBN'S KITB F USL HISB AL-HIND
Autor:	Levey, Martin / Petrucci, Marvin
Notizen:	NOTES AND REFERENCES
DOI:	https://doi.org/10.5169/seals-37970

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 07.08.2025

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>

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 *tansīf*, "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 *mintakh*; the next one and its alternates are called *eletmet* 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

- [1] M. L. is indebted to the National Science Foundation and the National Institutes of Health for research grants which aided in the preparation of this paper. He is also indebted to the American Philosophical Society for aid in investigating the Arabic MS.
- [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.*, 24; P. LUCKEY, "Die Rechenkunst bei Gamsīd b. Mas 'ūd al-Kaśī" (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. SCHÖY, *Isis* V, 395;
 - L. IDELER, "Hand. der math. und tech. Chronol." (Berlin, 1825-6), I, p. 263; *Zeit. d. Deut. Morgen. Ges.* XXIV, 375.

- [4] M. STEINSCHNEIDER, "Die Heb. Uebersetzungen d. Mittelalters" (Berlin, 1893), 352. Cf. also N. KRAUSE, Stambuler Handschriften islamischer Mathematiker. Quell. u. Studien zur Gesch. d. math. B3 (Berlin, 1936), pp. 472-3.
- [5] Lexicon bibliographicum et encyclopaedicum a Mustaphā ben Abdallah Katib Jele bi dicto et nomine Haji Khalfa celebrato compositum, ed. latine vertit et commentario indicibusque instruxit G. Flügel (Leipzig-London, 1835), V, 82, VII, 851.
- [6] Haji Khalfa, *op. cit.*, V, 142.
- [7] Cf. Steinschneider, *op. cit.*, p. 566.
- [8] J. TROEPFKE, "Gesch. d. Elementar-Mathematik" (Berlin, 1930), I, p. 82; P. LUCKEY, *op. cit.*, p. 73.
- [9] Cf. H. SUTER, *Bibliotheca Mathematica*, III/7; F. WOEPCKE, *Journal Asiatique* I, p. 492 (1863).
- [10] C. BROCKELMANN, "Gesch. d. Arab. Lit." (Leiden, 1937/43), I, 222-3, suppl. I, 397-8.
- [11] Aya Sofya 4857/7.
- [12] Bodleian, Oppenheim 211; Cf. M. STEINSCHNEIDER, *Zeit. f. Math.*, XII, 33; *Zeit. Deut. Morg. Ges.*, XXIV, 332.
- [13] Cf. M. STEINSCHNEIDER, Heb. Ueber., p. 124; J. C. WOLFIUS, *Bibliotheca Hebraica* (Hamburg, 1815-33); M. STEINSCHNEIDER, Hebraische Bibliographie (Berlin, 1858-64), XVI, p. 103.
- [14] LUCKEY, *op. cit.*, p. 75.
- [15] Luckey evidently never saw the Hebrew manuscript but accepted Steinschneider's very brief and inadequate description in *Abhandl. zur Geschichte der Mathematik*, 3, 109 (1880). It is now certain that Shalōm ben Joseph 'Anābī knew both books of ibn Labbān contrary to Luckey's assumption.
- [16] For al-Nasawī's (d. 1029/30) arithmetic, cf. F. WOEPCKE, *Journal Asiatique*, I, 489-500 (1863); Vide also Oskar SCHIRMER, "Studien zur Astronomer der Araber" (Erlangen, 1926), appendix by E. Wiedemann, pp. 46-8, 80-5; H. SUTER, *Bibliotheca Mathematica*, VII, 3rd series, pp. 113-9 (1906-7).
- [17] Al-Nasawī changed the number to 57342.
- [18] Ibn Labbān used an approximative method:

$$a^2 + r, \quad a + \frac{r}{2a+1}.$$

To obtain a more exact answer zeroes were added in pairs to the original number and the answer was divided accordingly.

- [19] Exactly the same method is carried out by al-Nasawī; cf. pp. 114-5 in H. SUTER, *Bibliotheca Mathematica*, VII, 3rd series (1906-7).
- [20] Cf. *ibid.*, 115-7.
- [21] Cf. H. SUTER, *op. cit.*, p. 116.
- [22] $60496 = 3(a+b)^2 + 3(a+b)c + c^2$; $424 = 3(a+b) + c$
 $4 \times 60496 = 241984$; $242100 - 241984 = 116$
 $241984 = 3(a+b)^2c + 3(a+b)c^2 + c^3$.

- [23] The remainder should be 116 parts of (62209+428) or

$$\frac{r}{3(a+b+c)^2 + 3(a+b+c) + 1}$$

This error is also in al-Nasawī. Essentially, ibn Labbān's approximation is

$$\sqrt[3]{a^3 + r} \sim a + \frac{r}{3a^2 + 3a + 1}$$

- [24] This is called the middle line in the text; al-Nasawī had the same nomenclature. Cf. SUTER, *op. cit.*, p. 117.
- [25] Cf. B. DATTA and A. N. SINGH, Hist. of Hindu Math. (Lahore, 1935); A. N. SINGH, *Archeion*, XVIII, pp. 43-62 (1936).
- [26] SUTER, *op. cit.*, p. 118.
- [27] S. GANDZ, "The Origin of the Term Root", *American Mathematical Monthly* 33, 161-5 (1926); 35, 67-75 (1928).
- [28] Introduction of MS.

Martin LEVEY,
Yale University
New Haven 11, Connecticut

Marvin PETRUCK
Dropsie College.