Writings of Great Mathematicians Infected with BV1570.

Euclidean Multiplication Definitions Recently Infected with BV1570 Upon Translation into English

Author	Abraham bar Hiyya - Hebrew (Guttman, 1913)	Jordanus de Nemore - Latin (Busard & Steiner, 1991)	Johannes Tropfke - German (Tropfke, 1980)
Original text	המספר המנוי במספר אחר הוא המספר הנכפל פעמים אשר מנינם כמנין האחדים אשר במספר השני אשר הוא נמנה בו, כמו שתי פעמים שלש או שתי פעמים עשרה והוא הנקרא מספר והמספר שטוח וזו צ ו ר ת ו : : : הנקבץ מהכפל הזה יקרא מספר שטוח.	Numerus per alium multiplicatur qui totiens coacervatur sibi quotiens in multiplicante est unitas; et qui ex multiplicatione provenit productus nominator	Man sagt, daß eine Zahl eine Zahl vervielfältige, wenn die zu vervielfältigende so oft zusammengesetzt wird, wieviel Einheiten jene enthält, und so eine Zahl entsteht
Infected translation	And the number that is multiplied by another number is the number that is **added to itself** as many times as there are units in the second number in which it is multiplied... (Corry, 2013)	A number is [said to be] multiplied by another when it is **added to itself** as many times as there is a unit in the multiplier; and what arises from the multiplication is called the product (productus). (Grant, 1974)	A number is said to multiply a number when that which is multiplied is **added to itself** as many times as there are units in the other, and thus some number is produced. (Schubring, 2005)
Disinfected translation	And the number which is counted by another number is the number which is multiplied the number of times which equals the number of ones the second number contains, like two times three or two times ten and it is called an areal number, this is its shape ::: and the number gathered from this multiplication is called an areal number.	A number is multiplied by another when it is accumulated as many times as there is a unit in the multiplier; and what arises from the multiplication is called the product.	You say that a number multiplies a number, if the number, which has to be multiplied, is put together as many times as how many unities those (number) contains, and so a number is created.
NOTES	Translated with the assistance of Dr. David Garber, from the Department of Applied Mathematics, Faculty of Science, Holon Institute of Technology, Israel. The absence of the 'added to itself multiplier times' concept was also confirmed via a slightly different translation to the above, courtesy of Dr. Nitsa Movshovitz-Hadar, Professor Emeritus, Technion - Israel Institute of Technology, Haifa, Israel.	A German historian, (Gericke, 1990), translated Jordanus' Latin definition of multiplication as follows. 'Eine Zahl wird mit einer anderen multipliziert, indem sie so oft aufgehäuft wird wie die multiplizierende Zahl Einheiten enthält; die bei der Multiplikation herauskommende Zahl wird Produkt genannt.' Just as the Latin coacerva(n)tur means heaped up or piled up or accumulated, so too, does the German aufgehäuft. For the Latin, see www.perseus.tufts.edu/hopper/morph?l=coacervantur&la=la For the German, see http://en.bab.la/dictionary/german-english/habet-aufgehaeuft	Translation courtesy of Dr. Ulrich Reich, of the Hochschule Karlsruhe University, Germany. The text in Tropfke was actually the correct 1935 translation of Euclid's multiplication definition by Clemens Thaer. 'Man sagt, daß eine Zahl eine Zahl vervielfältige, wenn die zu vervielfältigende so oft zusammengesetzt wird, wieviel Einheiten jene enthält, und so eine Zahl entsteht.'

Busard, H. L. L. & Steiner, F. (1991). *Jordanus de Nemore, De Elementis Arithmetice Artice, A Medieval Treatise on Number Theory, Part 1: Text and Paraphrase*, p. 12, Franz Steiner Verlag Stuttgart.

Corry, L. (2013). Geometry and arithmetic in the medieval traditions of Euclid's Elements: a view from Book II, in *Archive for History of Exact Sciences*, p. 668, Vol. 67, No. 6, Springer, Berlin.

Gericke, H. (1990). *Mathematik im Abendland: Von den römischen Feldmessern bis zu Descartes*, (Mathematics in the West: From the Roman surveyors to Descartes), p. 106, Springer Verlag.

Grant, E. (1974). A *Source Book in Medieval Science, Volume 1*, p. 102, Harvard University Press.

Guttman, M. (1913). Chibbur ha-meschicha weha-tischboreth; lehrbuch der geometrie des Abraham bar Chija Abraham bar Hiyya ha-Nasi, p. 51, Berlin.

Schubring, G. (2005). A Case Study in Generalization: The Notion of Multiplication, p. 275, in *Activity and Sign: Grounding Mathematics Education*, M. Hoffmann, J. Lenhard, F. Seeger (Eds), Springer.

Tropfke, J. (1980). *Geschichte der Elementarmathematik. Bd. 1, Arithmetik und Algebra,* von Johannes Tropfke; vollst. neu bearb. von Kurt Vogel, Karin Reich, Helmuth Gericke, de Gruyter, Berlin.

Euclidean Multiplication Definitions Infected with BV1570 a Long Ago Upon Translation into English

Author	Christiani Wolfii, 1732 A German Math Professor	Isaac Barrow, 1660 An English Math Professor	Isaac Newton (Bonus!) (On: a^3)
Original text	Multiplicatio est inventio alicujus numeri ex duobus datis, in quo toties continetur datorum unus, quoties unitas in altero. Numeri dati dicuntur Factores, item efficientes; quæsitus Factum, item Productum. In specie, factorum alter, qui aliquoties sumitur, vocatur Multiplicandus; alter vero qui indicat, quoties ille sumatur, Multiplicator.	Numerus numerum multiplicare dicitur, cum toties compositus suerit is, qui multiplicatur, quot sunt in ipso multiplicante unitates, & procreatus suerit aliquis.	Sic 3 in quantitate a^3bb non denotat *bb* ter capiendum esse sed *a* in se bis ducendum.
Infected translation	When Unity is contained as oft in one number, as another in a 3d, the 2 Numbers are called Factors or Co-efficients, and the third is the Product, arising from the one drawn into, or multiplied by the other, and is no other than **adding a Number to itself**, as often as there are Units in the other; but it's done sooner by Multiplication. (Hanna , 1765)	One number is said to multiply another, when the number multiplied is so often **added to itself**, as there are units in the number multiplying, and another number is produced. (Anon. 1660)	'… the Number 3 in the Quantity a^3bb, does not denote that *bb* is to be taken thrice, but that *a* is to be **thrice multiplied by itself**.'
Disinfected translation	Multiplication is the finding of a number from two given numbers; in this number one of the givens is contained as many times as there are units in the other. The given numbers are called factors and the number sought is called the product. Specifically, the factor taken a number of times is called the multiplicand and the other, that indicates how many times it is taken, is called the multiplier.	One number is said to multiply another, when the number multiplied is so often composed, as there are units in the number multiplying, and another number is produced.	So 3 in the quantity a^3bb does not denote *bb* taken three times but a led into [multiplied by] itself two times.
NOTES	A 1717 German definition by Wolfii (Wolfius) was also free of BV1570. This appeared in *Anfangsgründe aller mathematischen Wissenschaften*, (The foundations of all mathematical sciences). It read: *Multipliciren ist eine Zahl finden aus zwey gegebenen Zahlen / in welcher die eine gegebene so viel mal enthalten ist als die andere von den gegebenen.* Trans. *To multiply means finding a number from two given numbers in which the one given (number) is contained as many times the other (number) given contains unity.* Translation courtesy of Dr. Ulrich Reich.	The size of Isaac Barrow's *Elements* can be seen at www.j.mp/IsaacBarrowsLatinElements	NOTE Newton explains *bb* × 3, not as *bb* added to itself 3 times, but *bb* taken three times.

Anon. (1660). *Euclide's Elements The Whole Fifteen Books Compendiously Demonstrated by Mr. Isaac Barrow, Fellow of Trinity Colledge in Cambridge*, p. 142, William Nealand, London.

Barrow, I. (1655). *Euclidis Elementorum libri XV breviter demonstrati*, Cantabrigiae, Nealand.

Hanna, J. (1765). *A Treatise of Algebra, Christian Wolfius, Translated into English*, p. 2, Hawes, Clark and Collins, London.

Newton, I. (1707). *Arithmetica Universalis*, p.8, Cantabrigiæ, Londini. (NOTE Newton's name is not on the title page as he didn't want these notes published.)

Newton, I. (1769). *Universal Arithmetick: Or, A Treatise of Arithmetical Composition and Resolution*, p. 15, Written in LATIN by Sir ISAAC NEWTON. Translated by The late Mr RALPHSON; and Revised and Corrected by Mr CUNN, Printed for W. JOHNSTON, in Ludgate-street.

Wolfii, C. (1732). *Elementa Matheseos Universæ, Qui Commentationem de Methodo Mathematica, Arithmeticam, Geometriam, Trigonometriam, Planam…* p. 23, Geneva, 1732.

Wolfii, C. (1717). *Anfangsgründe aller mathematischen Wissenschaften*, Halle in Magdeburgischen: Verlegt in der Rengerischen Buchhand.

ON THE INFECTION OF EXPONENTIATION

To explore how BV1570 impacted people's idea of exponentiation, I conducted yet another poll.

How Do YOU Cube A Number?

a^3 is *a* multiplied by itself 2 times	54 votes	54.0%
a^3 is *a* multiplied by itself 3 times	46 votes	46.0%

Source: 2013 poll of LinkedIn professional networking groups: *Math, Math Education, Math Culture.*

Given any number, *a*, not multiplied by itself, equals a^1, and any number *a*, multiplied by itself once, equals a^2, we arrive at any number, *a*, multiplied by itself twice, equals a^3. So again, almost half the mathematics community appears to prefer an algorithm that does not compute, over once that does. Such sloppiness cannot exist in computer code, as logical errors do not compute. So why not program the brains of children correctly?

Further evidence about half our explanations of exponentiation are infected with BV1570.
http://www.jonathancrabtree.com/mathematics/wp-content/uploads/2016/09/cube-confusion.pdf