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LAUGHING AT NUMBERS:
EVIDENCE FOR NUMERACY IN THE *PHILOGELOS*

ABSTRACT. Brodersen Kai, *Laughing at Numbers: Evidence for Numeracy in the "Philogelos"* (Śmiejąc się z liczb: przykłady obliczeń *w Filogelosie*)

Ancient numeracy is reasonably well attested in scientific sources. However, any study of applied mathematics faces the problem of a dearth of evidence. The paper suggests that the jokes collected in the "Philogelos" provide such evidence, and discusses the failings which are referred to in these jokes.

Keywords: numeracy; education; applied mathematics; Philogelos; jokes

1. EVIDENCE AND MODELS FOR ANCIENT NUMERACY[1]

Then listen, pop, and relax your frown a bit. First of all, calculate roughly (*logisai*), not with counters (*psephois*) but on your fingers (*apo cheiros*), how much tribute we receive altogether from the allied cities. Then make a separate count of the taxes and the many one percents, court dues, mines, markets, harbours, rents, proceeds from confiscations. Our total income from all this is nearly 2000 talents. Now set aside the annual payment to the jurors, all 6000 of them, 'for never yet have more dwelt in this land.' We get, I reckon, a sum of 150 talents.[2]

Ancient History – Evidence and Models was the title of one of Sir Moses Finley's most influential books.[3] The title makes the point that historians of the ancient world need to address both the evidence we have from antiquity and the models we use to interpret it. Any study of models for ancient numeracy and "applied mathematics" is faced with the problem that the evidence, as preserved to us, was usually created, enjoyed, and transmitted by, and for, a literary elite. However,

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[2] Aristoph. *Vesp*. 655–63 (transl. Henderson 1998: 305).

[3] Finley 1985; the title is consciously repeated in Manning and Morris 2005.

to understand "applied mathematics" in other parts of ancient societies, it may well be worthwhile to look at a type of evidence which might not come to mind immediately: jokes.

After all, jokes are transmitted by word of mouth – indeed, they work best when presented orally. The aim of this short paper, then, is to show that studying jokes, as told over a long time and collected in the *Philogelos*,[4] could, and indeed should, be considered as valid evidence for models used to understand ancient numeracy.

Of course, we have plenty of evidence for numeracy in what Patricia Crone has called the "veneer of scholarship" in pre-modern societies:

> An educated man could travel over huge distances speaking the same learned language, discussing the same body of ideas and getting the same kind of job all the way. But the trans-local culture did not penetrate very deep.[5]

While the trans-local culture in Greek 'scholarly' mathematics has been well studied,[6] evidence for the everyday application of these concepts and skills is remarkably scarce. To be sure, Herodotus refers to applying *psephoi* for calculations when he mentions, among the basic differences between the Egyptians and the Greeks, that the latter "write letters and calculate with *psephoi* by moving their hand from left to right while the Egyptians do it from right to left."[7] It is not the use of *psephoi* but the direction in which they are used that Herodotus' audience is invited to find outlandish. Aristophanes (see above) assumes that using *psephoi* for calculations was common, and Polybius (5,26) relates a story about Apelles, who in 218 BC arrived in Corinth with great pomp and proceeded straight to the royal quarters of Philip V. However, as he was about to enter "as had been his former custom" (he had been an influential courtier), one of the ushers prevented him from doing it, saying that the king was engaged.

> Disconcerted by this unexpected rebuff, Apelles after remaining for some time in a state of bewilderment withdrew much abashed, upon which his followers at once began to drop away quite openly, so that finally he reached his lodging accompanied only by his own servants. So brief a space of time suffices to exalt and abase men all over the world and especially those in the courts of kings, for those are in truth exactly like *psephoi* on an *abakion*. For these at the will of the *psephizon* are now worth a *chalkous* and now worth a *talanton*.[8]

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[4] The latest editions are by Thierfelder 1968, Dawe 2000 (but see Jennings 2001), and Brodersen 2016 (with full bibliography). An English translation was published by Baldwin 1983 (see however below), while Hansen (1998: 272–84) only presents a short selection, and Crompton 2010 is a free adaptation rather than a translation.

[5] Crone 2003: 88–89.

[6] Cf., e.g., the easily accessible Loeb volumes by Thomas 1939–1941 (and reprints).

[7] Herodotus 2,36 (own translation); cf. the translation by Godley 1920: 319.

[8] Polyb. 5.26.12–13 (Paton et al. 2011: 73).

Clearly, Polybius could rely on his readers' knowledge of the mechanics of the changing value of *psephoi* on an *abakion*. Indeed, a number of *abakia* have been found, obviously without any explanation as to how they were used.[9] Similarly, the 4th-century 'Darius Vase'[10] depicts a treasurer using an *abakion*, but does not show his workings, of course. In fact, there is no single text from antiquity dealing with 'applied' numeracy. Dating from the Byzantine age, the *Paradosis tes psephophorikes epistemes* by the 14th-century AD author Nicolaus Artabasdos "Rhabdas" seems to preserve the earlier practice.[11] Accordingly, standard *Histories of Greek Mathematics*[12] tend to gloss over 'applied' mathematics.[13] The apparent lack of new evidence appears not to have enticed scholars to revisit the topic since.

However, there is indeed some relatively new evidence: jokes. While the *Philogelos* collection on which this study focuses has been known for a long time, the first complete critical edition of the text was only published in 1968 and appears to have escaped scholarly attention to date, when evidence and models for numeracy are being discussed by scholars.

2. THE *PHILOGELOS*

In the 12th century AD, the Byzantine scholar Johannes Tzetzes wrote an extensive historical work, in which he presented 660 chapters with historical notes and excerpts in verse. The work, which is based on a thorough analysis of ancient traditions, is known today as *Chiliades*. In the 250th chapter, Tzetzes offers the following verses:

> *Philogelos* wrote in his book: A patient was visited by a friend. When he latter did not get up and did not simply retreat, the patient was displeased, stood up from the stretcher, bid him farewell, and went out of the house.[14]

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[9] Cf. *Inscriptiones Graecae* II² 2777–81: marble tables from Salamis and the Athenian acropolis, and a ceramic one from Eleusis, cf. also IG IX 1, 488 (Thyrreion), XII 5, 99 (Naxos), XII 7, 282 (Minoa on Amorgos), XII 8, 61 and 62 (Imbros). Obviously, the epigraphic publications mostly give the plain 'text' on the slabs, which is nothing but a series of numbers, but do not allow the user to envisage the distribution of this 'text' on the artefact, and hence its function. See Nagl 1914, Nagl 1918, Vogel 1936 (part I, further parts were never published because of World War II), and especially Schärlig 2001.

[10] Cf. Trendall and Campitoglou 1982: II 495, no. 18/38, pl. 176,1.

[11] Edited by Tannery 1886.

[12] Cf., e.g., Gow 1884 (repr. 2004), Heath 1921 (repr. 2005).

[13] Cf., e.g., Friedlein 1869 (repr. 1997), Cantor 1922, but see Cuomo 2001 (without reference to the *Philogelos*).

[14] Tzetzes, *Chiliades* 8, 969–73 (ed. Leone 2007; own translation).

When a patient's visitor does not want to go, the patient himself gets up and goes "out of the house," which in addition to the literal sense can refer to dying. As his source for this story, Tzetzes refers to *Philogelos*, the "Friend of Laughter." As it happens, the extant *Philogelos* presents a similar joke as no. 70.

Some of the preserved medieval manuscripts attribute *Philogelos* to authors named Hierocles and Philagrios; both are otherwise unattested. The 10th-century encyclopedia known as *Suda* attributes a book called *Philogelos* to the comedic poet Philistion in the 4th century BC, as dedicated to a *koureus* (*Suda*, phi 364). Since every further context is missing, it cannot be said whether the word denotes a barber (for which *koureus* is the Greek word, cf. *Philogelos'* jokes nos. 56, 148, 167, 198) or a man named Koureus, and whether the book is a selection of jokes from comedies or an independent work. However, as Tzetzes shows, these names are not important: the title "Friend of Laughter" (*Philogelos*) was so catchy that it has prevailed, and the various names associated with it mainly show its popularity.

The *Philogelos* is a collection which seems to have accumulated over time. Several jokes appear more than once in it, and some are known from the older tradition, so no. 142 from a fable of the Aesopus (No. 57 H) and no. 193 by no less a figure than the great Roman statesman and scholar Marcus Tullius Cicero (*De Or.* 2,276). Jokes are also found in collections of *Apophthegmata*, proverbs, and winged words by Plutarchos of Chaironeia in the 1st/2nd century AD and others. The *Philogelos* collection in its current state can, however, only date from the 3rd century AD at the earliest, because no. 62 (which will be quoted below) refers to the millennium of the city of Rome. This event was celebrated on April 21st, AD 248. For their part, jokes from the *Philogelos* were found in later traditions in Byzantium as well as in the Syrian and Arabic cultural contexts.[15] Indeed, some of the jokes appear to be familiar enough to a modern audience; there are even reports that the eminent Cambridge classical scholar Richard Porson (1759–1808) attempted to demonstrate that all the jokes in the famous English collection of jokes, first published in 1739 under the name of the playwright Joe Miller (1684–1738), were taken from *Philogelos* and other ancient works. Similarly, some jokes seem to have persisted until now.[16]

Obviously, we would like to ask about the "sociology of humour," including the origin of the collection, the collector and the original audience, as well as the original order in which the jokes are presented,[17] and do some number-crunching on the relative frequency of the topics, or implications, of the jokes.[18] However, the transmission of the *Philogelos* is not as straightforward as that of

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[15] For a Syrian version see Horovitz (1905: 55–76), ("Ein syrischer *Philogelos*"), and for an Arabic one Marzolph 1987.

[16] Cf. Hansen 2001, Brodersen 2017.

[17] Cf., e.g., Hansen 2001.

[18] Cf., e.g., the questions addressed in Bremmer and Roodenburg 1997.

most ancient literature and does not allow for answers to such questions. In fact, the text is preserved in two versions which vary both in quantity – there is a long and a short version – as in the order of the jokes presented.

The text of the long version can be reconstructed from a 12th-century manuscript,[19] the *Codex Parisinus suppl.* 690 in the French National Library. This long version comprises 260 jokes, seven of which are duplicates (44b of 17, 79b of 27, 90b of 30, 91b of 31, 96b of 32, 158b of 35, 175b of 3) and one (209) is doubled in the manuscript itself. The jokes are sorted thematically by the main butt of the jokes, i.e. *scholastikoi* (see below; nos. 1–103), Misers (nos. 104–09), Abderites (nos. 110–27), Sidonians (nos. 128–39), Jesters (nos. 140–53), Cymaeans (nos. 154–82), Ill-Tempered Men (nos. 183–95), Stupid Men (nos. 196–205), Cowards (nos. 206–10), Fools (nos. 211–13), Spiteful Men (nos. 214–16), Cowards again (nos. 217–18), Greedy Men (nos. 219–26), Drunkards (nos. 227–30), Stinkers (nos. 231–42), Gluttons (no. 243), Women (no. 244–45), Women Haters (nos. 246–50), Women again (no. 251) and Losers (no. 252).

Cowards and Women appear twice, clearly a consequence of the later additions to the collection. The largest groups mocked in this version of the *Philogelos* are *scholastikoi*, educated men (and in some cases their teachers, *grammatikoi*)[20] and members of marginal communities like Sidon (now in Lebanon), Abdera in the North Aegean coast (in modern Greece) and Kyme in the west coast of Asia (in today's Turkey), who are associated with a kind of "Gothamist" behaviour.[21]

In contrast, the short version, which contains only 68 jokes, is based on two 15th – century manuscripts, the *Codex Vindobonensis gr.* 192 in the Austrian National Library in Vienna and the *Codex Estensis* α.P.7.16 in the Biblioteca Estense in Modena. It presents 57 of the jokes in the long version, arranged differently, and offers 11 additional jokes. The jokes it takes from the long version often appear in a shorter format and in a somewhat younger form of language. Finally, one extra joke (which, to be sure, only varies in nos. 92 and 136) is contained in an Italian manuscript from the 10th century, preserved as *New York Pierpont Morgan Library Codex* 293. This oldest surviving copy of *Philogelos* jokes offers only seven jokes (265, 34, 22, 24, 29, 104, and 106) in total.

It was only in 1943 that the American scholar Ben Edwin Perry (1892–1968), who knew this codex, laid down the foundations for a critical edition, but did not publish one. Thus, the scholarly world had to wait until 1968 for the first edition of the long version of the manuscript, published by the Mainz classicist Andreas Thierfelder (1903–1986). He also drew up additional codices for the first time.[22]

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[19] For the date cf. Lauxtermann 2003: 329–33.

[20] Cf. Sluiter 1988.

[21] "Gotham" is "the name of a village, proverbial for the folly of its inhabitants ('wise men of Gotham')" (*Oxford English Dictionary).*

[22] Perry 1943, Thierfelder 1968; for more recent editions, see above note 4.

So the text of the *Philogelos* has been known for just over fifty years, and as yet seems to have escaped notice in the realm of numeracy studies.

3. JOKES ABOUT NUMERACY IN *PHILOGELOS*

As we have seen, the oral tradition of jokes can cover substantial amounts of time and many places as well as many social strata. Although *Philogelos*, as preserved, dates to late antiquity, it is (*pace* Mary Beard) not a document for just "Roman" laughter, but collects earlier, and notably Greek, material.[23] So what kind of evidence do they provide for numeracy? Let us look at all the 15 relevant jokes in the *Philogelos*.

3.1 MIXING UP THE SIGNIFIER AND THE SIGNIFIED

One set of jokes makes fun of a person, most notably a *scholastikos*, mixing up the signifier and the signified (as do many non-numeracy jokes in the collection):

> A *scholastikos* who had a country estate many miles (*milia*) away, so as to make it closer, overturned seven milestones (*milia*). (*Philogelos*, no. 60)[24]

> A *scholastikos* from Sidon had a country estate many miles away and wanted to make it closer, overturned seven milestones. (*Philogelos*, no. 131)

> A *scholastikos* who was travelling by sea was in danger that the boat would sink in a storm. His fellow passengers started throwing things from their luggage overboard so as to lighten the vessel, and they urged him to do the same. He produced a bank draft (*cheirographon*) worth 150 Myriads, took away the 50, and said, "see by how many things (*chremata*, "things" or "money") I have lightened the ship!" (*Philogelos*, no. 80)

> A Cymaean who broke into the house of a moneylender and wanted to steal his largest debts (*daneia*) chose the heftiest booklets (*chartia*). (*Philogelos*, no. 161)

The jokes about shrinking a distance make fun of a *scholastikos* who thinks that real distances depend on the number of milestones, while the third and fourth suggests that a *scholastikos* or a Cymaean thought of a written sum or the size of a booklet as identical with the real weight of the real money represented and recorded. While the Cymaeans are regularly referred to as not very bright,

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[23] Beard 2014, *contra* Brodersen 2016: 8–9.
[24] For the editions see above, note 4 (I provide my own translations here). Baldwin (1983: 12) wrongly translates "chipping a seven from the milestone marker."

associating a similar lack of ability to differentiate between a signifier and signified by a *scholastikos* can be understood as a funny way to characterize these potentially learned folk as similarly stupid.

3.2 UNAWARENESS OF THE RELATIONSHIP BETWEEN NUMBER AND UNIT

Other jokes laugh at a learned person – a *scholastikos* or a *grammatikos* – who appears to be unaware of the relationship between number and unit:

> A *scholastikos* asked his father: How much does a *pentakotylos lekythos* (a five-kotylos flask) hold? (*Philogelos*, no. 92)

> A teacher (*grammatikos*) from Side asked a pupil how much a *pentakotylos lekythos* holds. He replied: "Do you mean wine or oil?"[25] (*Philogelos*, no. 136)

> When a *scholastikos* asked, how many *xestai* an *amphora* holds, he replied: "Are you talking about wine or water?" (*Philogelos*, no. 265)

It is remarkable that joke no. 92 rather straightforwardly refers to a lack of understanding of the relationship of number and unit (*kotylos* and *pentakotylos*) by the *scholastikos*, while no. 136 develops this to include a secondary joke about the liquid referred to, and no. 265 focuses on this (a *xestes* is 1/48th of an *amphora*, but the *scholastikos* does not understand this). Similarly, *scholastikoi* are unaware of the relationship between a mere number and the unit it represents in two further jokes:

> Someone went to a *scholastikos* physician and said: "Physician, whenever I get up after a sleep, I feel dizzy for half an hour, then I'm all right to get up." And the physician said: "Get up after half an hour." (*Philogelos*, no. 3)

> A *scholastikos* who attended the games which were held in honour of the millennium of Rome saw a defeated athlete crying and consoled him: "Don't be sad, you will win at the next millennium games." (*Philogelos*, no. 62)

3.3 UNAWARENESS OF SIMPLE CALCULATIONS

The third kind of jokes makes fun of learned people who are unaware of simple calculations:

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[25] Baldwin (1983: 25) wrongly translates *didaskomenos* ("person taught") as "schoolteacher," thus missing the joke that the pupil is not that well taught by the *grammatikos*, after all.

A *scholastikos* who had learned about a particular ladder that it had twenty rungs going up, asked whether there were as many going down.[26] (*Philogelos*, no. 93)

A *scholastikos*, who had received samples of length and width so as to bring a cloth, asked which was the length and which the width.[27] (*Philogelos*, no. 71)

The number of rungs on a ladder does not differ, whether counting them upwards or downwards, and for a sample piece of cloth it does not matter which side is the length, and which the width. So the *scholastikos* is presented as unaware of simple real-life calculations.

3.4 INAPPROPRIATENESS OF SIMPLE CALCULATIONS

Other jokes combine the unawareness of the relationship between number and unit, and the inappropriateness of simple calculations:

A *scholastikos* who was starting a journey was addressed by a friend: "I ask you to buy me two slave boys, both 15 years old." He said: "If I cannot find them, I'll buy you one thirty-year old."[28] (*Philogelos*, no. 12)

The same *scholastikos* said to his soldiers: "Tomorrow we have to march a long way, so have a longer rest today." (*Philogelos*, no. 84)

A physician from Cyme changed a patient suffering from tertian fever to semi-tertian and asked for half the fee. (*Philogelos*, no. 175a)

3.5 CALCULATING BY NUMBERS VS CALCULATION BY FINGERS

Finally, a joke brings us back full circle to Aristophanes' reference to counting by fingers. It plays on the two ways in which ancient Greek allows the speaker to refer to a unit of two, by referring to two or by using the dual:

An untalented *grammatikos* was asked: "How must one say: 'for the two' or 'for the twain'?" He lifted his hand and showed his two fingers. (*Philogelos*, no. 196)

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[26] Baldwin (1983: 18) rather freely translates "how many it had going down."

[27] Baldwin (1983: 14) rather freely translates "asked if the length was longer than the breadth."

[28] For the sexual innuendo cf. the remarks by Beard (2014: 199), who claims she included this reluctantly and only "in deference to my graduate class at Berkeley" (Beard 2014: 273 n. 61).

4. CONCLUSION

Numeracy matters in the jokes collected in the *Philogelos*. While two jokes (nos. 161 and 175a) of the relevant ones refer to men from Cyme (one of them a physician), who are lampooned in a whole chapter of the work (no. 154–182), and two further ones (nos. 136 and 196) to *grammatikoi* who do not feature as a separate chapter in the *Philogelos*, the majority of number and numeracy jokes make fun of *scholastikoi*. One of them is from Sidon (no. 131), one is a physician (no. 3), but all others (nos. 12, 60, 62, 71, 73, 80, 92, 265) are referred to simply as *scholastikoi*. As we have seen, the largest group of jokes in the *Philogelos*, at least in the long version, focuses on this group of educated men.[29] They, more than uneducated (or, like the Cymaeans, supposedly stupid) folk, should be numerate enough not to mix up a signifier and a signified, they should be aware of the relationship of number and unit, and of simple calculations including their appropriateness – and most of all they should be able to do more than count by their fingers. If even learned men get this wrong, that allows everyone to mock them – after all, even simpletons are capable on this basic level of numeracy. While most extant literary sources hardly mention this, the little collection of jokes provides us with precious evidence for numeracy in the ancient world.

PS: Of course, the fact that the jokes were eventually written down and collected in the *Philogelos* is a kind of double bluff, transferring the popular oral joke into the realm of a book, and thus allowing its learned readers to laugh at themselves – and us at ourselves …

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[29] Cf. Sluiter 1988.

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S u m m a r y

Ancient numeracy is reasonably well attested in scientific sources which represent the "veneer of scholarship" in these pre-modern societies. However, any study of applied mathematics faces the problem of a dearth of evidence. The paper suggests that a study of jokes can provide such evidence, as jokes were told and retold in a "subliterary" sphere. The 3rd century AD collection attributed to the *Philogelos* ("Laughter-Lover") makes fun of failings in applied mathematics. The jokes attest to basic levels of numeracy well below the "veneer of scholarship." Even for simpletons, differentiating between signifier and signified, understanding the relationship of number and unit, at least simple calculations including their appropriateness could be expected, and calculating should go beyond counting by fingers. The *Philogelos* thus provides valuable, but rarely studied evidence for ancient numeracy.