Chapter 1

Introduction


In this book I use “Roman” to refer to all Greek or Latin speaking inhabitants of the Roman Empire (whether actual Roman citizens or not).

On the nature and origins of the university system, which arose after the 11th century, see Ferruolo 1998, Pedersen 1997, De Ridder-Symons 1992, Hastings 1987, Bowen 1975, and Haskins 1923 (with one possible exception in the East, the rather unique Academy of Constantinople, founded in the 5th century, developed in the 9th, and disbanded in the 14th: see Markopoulos 2008, Constantelos 1998 and, though perhaps less reliably, Kyriakis 1971). For a broad, although fairly unsophisticated introductory survey of the development of education from Greece, through Rome, into the Middle Ages and then the modern era, see Dobson 1932. For a broader multicultural survey of ancient education, see Bowen 1972.

On science content of medieval universities see Rossi 2001: 192-202. It should also be noted that medieval students did not enjoy the same intellectual liberty that ancient students did (largely due to attitudes detailed here in chapter seven). See Freeman 2002, esp. where supported by Carrier 2010: 419 n. 56.

On early American schools see Reese 2005.


On the craze for mathematics in the Renaissance see Nahin 1998: 8-47.

Chapter 2

Who Was Educated

Quotations from throughout Marrou 1956, translated from the French by Dr. Carrier.

Hill analogy discussed in Cribiore 2001: 1-12. On the Tablet of Cebes, see Seddon 2005 and Trapp 1997 as well as Diogenes Laertius, Lives and Opinions of Eminent Philosophers 2.125. The Tablet of Cebes is commonly dated to the 1st century A.D. (though it purports to have been written centuries earlier), although the Christian Tertullian claims a close relative of his composed it (see Tertullian, Prescription against Heretics 39), which if true (and if he means the same book) would more likely place it in the 2nd century A.D.

The only significant attempt to respond to Harris has been Humphrey 1991, which attempts to offer rebuttals or qualifications to Harris’ conclusions, but the included essays do not offer any effective challenges to his methodology and I found no evidence there that Harris hadn’t already considered, either in fact or in kind. See also in support of Harris OCD 843–44 (s.v. “literacy”), Hezser 2001, Woolf 2000, and Johnson and Parker 2009 (which also includes an extensive post-Harris bibliography: 333-82).


Pliny the Younger, Panegyric 26-28, reports that in Rome alone such a scheme was serving “nearly five thousand” boys (and the number was growing: Duncan-Jones 1982: 290, 293), and this may have been in addition to girls. Even if girls were not already included, they certainly were by the time of Antoninus Pius in the middle of the second century, as reported in the Historia Augusta = ‘Julius Capitolinus’, Life of Antoninus Pius 8.1, and confirmed by coins and reliefs, cf. Cohen & Rutter 2007: 66-67, but considerable evidence suggests this practice had already begun with Trajan, cf. Ramsay 1936. It is estimated that between one hundred thousand and two hundred thousand Italian children benefitted at any given time from Trajan’s charity (Duncan-Jones 1982: 317), while even more would have benefitted from other similar charities in and out of Italy.


Quintilian, Education in Oratory 1.1.6. For his date and background see OCD 1251–52 (s.v. “Quintilian (Marcus Fabius Quintilianus)”). On the women he names as orators see Snyder 1989: 123-27 and Plant 2004: 104-05.

Delphic inscription: Agusta-Boularot 2004: 322, 330, with Fouilles de Delphes 3.4.79.


Lactantius, Divine Institutes 3.25. Also, regarding his flat earth views, ibid. 3.24 vs. Pliny the Elder, Natural History 2.65.

Women named as philosophers: Diogenes Laertius, Lives and Opinions of Eminent Philosophers 6.96-98 (Hipparchia) and 2.86 (Arete). On Hierarchia there is also an epigram by Antipater of Sidon (Palatine Anthology 7.413). Pythagoras was also reputed to have made philosophers of his wife and daughter (OCD 988 and 1450, s.v. “Myia” and “Theano”; however cf. EANS 49 and 781-82, s.v. “Aisara of Lucania” and “Theano, pseudo”) as well as Themistoclea, and Plato’s “disciples” included “two women,” Lastheneia and Axiothea, according to Diogenes Laertius, Lives and Opinions of Eminent Philosophers 3.46; and others (Snyder 1989: 106-13; Plant 2004: 68-86). Plato himself claims one woman (Diotima) among the ‘presocratic’ philosophers (insofar as she was teaching when Socrates was a student, assuming the account is not fictional): Plato, Symposium 201d-212b. Epicurus was also famed for including women in his school—elite prostitutes in particular (these hetairai, lit. “companions” or “lady friends,” were already expected to be well educated in order to hold stimulating conversation with elite male clients, cf. Pomeroy 1995: 89-92, 141, and thus would have been of all women at that time the most suited to studying philosophy). The most famous of these was Epicurus’ lover Leontion (herself perhaps the first published feminist philosopher—her tract defending women against the disparaging remarks of Theophrastus is lost), but other women studying under Epicurus had telltale names suggestive of a similar profession (Hedeia, “Sweety”; Mamaron, “Titsy”; Erotion, “Sexy”; Boidion, “Oxeyes,” similar to our “Doe Eyes”; and the more ordinarily named Demetria, “Demeter’s Girl”); see Pomeroy 1995: 103-05. A Galenic treatise also praises an otherwise-unknown Arria, identified as Galen’s best friend (philitate), and as a brilliant Platonist philosopher: cf. Nutton 2004: 223, citing On Theriac to Piso Kühn 14.218 (not 14.208 as misreported.
in Nutton), and Nutton 1997 (which convincingly defends Galen’s authorship of this treatise). Notably an
unnamed female Platonist philosopher is also the dedicatee of Diogenes Laertius’ Lives and Opinions of Eminent
Philosophers 3.47, written around the same time. For many more examples see scholarship cited in previous and
following notes (e.g. women philosophers as dedicatees of inscriptions: Levick 2002: 134, etc.).

Gourevitch 1970, supplemented by Agusta-Boularot 2004: 328-29, esp. n. 61); Parker 1997; Nutton 2004: 142,
196-98; and most recently Flemming 2007 (see also EANS 94, s.v. “Antioikhis of Tlos”). Flemming also
examines the question of whether any women wrote medical books, but finds the evidence disputable,
encountering the same problem that plagues the alchemical tradition (see note below). Of course, whether we
know of any is not the same as whether there were any. In any case see EANS 121, 173, 281, 316, 354, 447, 456,
482, 500, 552, 564, 588, 596, 719, 725, 755, 778-79 (s.v. “Aquila Secundilla,” “Aspasia,” “Elephantine/
Elephantis,” “Eugeneia” and “Eugerasia,” “Hagnodiike of Athens,” “Iuliana,” “Junia/Iounias,” “Kleopatra of
of Lesbos?” and “Samithra/Tanitros (?)” and “Soteira,” and “Thaïs”).

On the education of midwives: Galen, On the Doctrines of Hippocrates and Plato 9.3; Soranus, Gynecology 1.3-4.


On women research scientists in antiquity: Ptolemaïs of Cyrene wrote a treatise on harmonics and music theory
around the turn of the era (first century B.C. or A.D.). We know nothing else about her, except that her work
appears to have been at least modestly brilliant and influential (Levin 2009: 230-93; Plant 2004: 87-89; Irby-
[s.v. “Ptolemaïs of Cyrene”], and EANS 705-06 [s.v. “Ptolemaïs of Kurene”]). Hypatia of Alexandria, a professor
of Platonic philosophy in the late fourth and early fifth century A.D., wrote commentaries in mathematics and
astronomy, and was consulted on the construction and use of laboratory instruments for the study of physics
716 [id.]; EANS 423-24, [s.v. “Hupatia”]; and Harich-Schwarzbauer 2011). Pandrosion taught in the fourth
century A.D. (Netz 2002: 197; EANS 608-09, s.v. “Pandrosion”), but we’re told no details of her scientific
interests. Likewise there may have been at least one female agricultural writer, but this conclusion is based on a
single letter in a name that could have been corrupted in transmission (EANS 637, s.v. “Persis,” which could be
an error for Perses). Some alchemical treatises were attributed to otherwise unknown female authors, but their
names do not seem authentic (e.g. “Maria,” cf. EANS 531, more probably an apocryphal attribution to the sister
of Moses), and fanciful pseudonyms were common in the alchemical tradition (Irby-Massie & Keyser 2002:
238-41, 243-45; Plant 2004: 130-47; e.g. EANS 446, s.v. “Isis, pseudo (Alch.)” and “Isis, pseudo (Pharm.”)), and
since alchemists believed their art had been “revealed” to mortal women by fallen angels in their attempt to woo
them (from the Book of Enoch 6-8; cf. DSB 14.631, in s.v. “Zosimus of Panopolis” and OCD 51-52, s.v.
“alchemy”), suspicion is warranted when alchemical knowledge is attributed to a woman. But their involvement
in the art is possible. Other possible female scientists in antiquity are listed in EANS 1029 (and discussed in their
associated entries).

Agusta-Boularot 2004 finds evidence of female teachers above the elementary level scarce, but abundant for female
scribes, secretaries, and librarians, and to some extent elementary teachers (ibid.: 329-30).

On class system thinking: contrast Toner 2002 with Atkins & Osborne 2006: 4-11.

Julia Domna was called “the philosopher Julia” in Philostratus, Lives of the Sophists 2.622 and was said to have
actively studied philosophy in Cassius Dio, Roman History 76.15.7 and 78.18.3; both men knew her personally.
and OCD 754 (s.v. “Iulia Domna”).


Evidence of education among elite women is comprehensively surveyed in Hemelrijk 1999, with Levick 2002
discussing women’s educational access to philosophy in particular; several prominent examples from the Roman


Quote from Plutarch, *Marriage Advice* 48 (= *Moralia* 145b-d).

For more on this Algaonike see Bicknell 1983.

Material in Plutarch from *Marriage Advice* 48 (= *Moralia* 145e-146a).

Musonius Rufus, *Sermons* 3 and 4.


On the “gymnasial” class as a recognized elite social status see Whitehorne 1982 and Hin 2007.


Modern class size ratios according to the Center for Education Reform: http://www.edreform.com/Fast_Facts/K12的事实.

The other group of scholars quoted: Johnson and Parker 2009: 46-51.


Diodorus Siculus, *Historical Library* 12.12.4-12.13.3.

Origen, *Against Celsus* 1.27: *hoi idiôtai kai agroikoteroi*, “idiots and farmhands,” or more literally, “nonprofessionals and countrydwellers,” the latter in the comparative (“more so” hence “more hick”). In context these words carry the definite connotation of “ignorant laymen and those more rustic,” compared with *tôn en logos gégnamasmenôn*, “those practiced in reason,” i.e. those having received oratorical education and experience in the public *gymnasia*. See *LSG* 15 (s.v. “agroikos”), 819 (s.v. “idiòtês” III.1-3), and 362 (s.v. “gymnázô” I.Pass.) and 1057-59 (s.v. “logos” e.g. IV.1).


Tertullian, *Against Praxeas* 3: using the words *simplices, imprudentes*, and *idiota*, “simple, naive,” “foolish, ignorant,” “layman, amateur,” respectively. See *OLD* 1764-65 (s.v. “simplex” 8.b), 853 (s.v. “imprudens” 1), 820 (s.v. “idiota” 1).

Galen, *On the Affections and Errors of the Soul* 2.3 (= Kühn 5.71): *tois epitugchanousin anthrôpois* literally translates “the men chanced upon,” which in context indicates the average man you would meet if you just grabbed someone at random. Notably, all of Galen’s examples (*aipolois*, “goatherds”; *boukolois*, “cowherds”; *skapaneusi*, “diggers”; and *theristais*, “reapers, harvesters”) are agricultural, but these would still have been the most common occupations in antiquity, even among men who would be wandering around town during the day. Galen says such men are *agumnastoi*, lacking an education of the *gymnasia*, but in context he clearly means lacking any education at all.
Galen, *On the Therapeutic Method* 1.1.5 and 1.3.2.

Pliny the Elder, *Natural History* 25.6.16 (where *agrestes* are *litterarum ignari*); Ptolemy, *Tetrabiblos* 1.2.7-8 (*geôrgos* and *nomeus*).

Quintilian, *Education in Oratory* 1.1.


Several times Quintilian refers to the assumed illiteracy of the lower classes (e.g. *Education in Oratory* 2.20.6, 2.21.16, 10.3.16, 12.10.53).

Netz 2002: 201-09.

See also Rihll 2002: 12-21 who discusses how various aspects of the education system limited the number of scientists in all eras of antiquity, though she comes to no definite conclusion as to numbers.


At the other extreme, Collins 1998: 76-77 estimates the number of ‘significant philosophers’ (those responsible for major innovations) at no more than thirty in any given century, but his methods rely on extant literature, which can only have resulted in an undercount.

**Chapter 3**

**What They Were Taught**

This chapter’s analysis draws on the findings and conclusions developed in Cribiore 2001 and corroborated in the scholarship that will be cited in more specific detail as the occasion arises. For a brief yet broad survey of ancient education see *OCD* 487–91 (s.v. “education, Greek” and “education, Roman”) and König 2009. Marrou 1964, once the standard resource, has been updated considerably: see Too 2001 and Pailler & Payen 2004 (which also includes a bibliography of books on ancient education published after 1964 on pp. 361-68), as well as Wolff 2015 and Sandnes 2009: 16-39; and Bloomer 2011 (for imperial education in Latin). A handy if eclectic collection of sources on ancient education is also provided in Joyal, McDougall, and Yardley 2009.

Diocletian’s *Edict on Maximum Prices (EMP)* 7 (some of which is in Lewis & Reinhold 1990: 2.425-26; with relevant discussion in Harris 1989: 308).

For a general introductory discussion of ancient “higher” education, including rhetoric, philosophy, and the *enkyklios paideia*, and the ages of students embarking on it, see Kleijwegt 1991: 116-23.


Bilingualism and multilingualism in antiquity: Mullen & James 2012. See, for example, the casual observations of Quintilian, *Education in Oratory* 1.1.12-14. Adams 2003, and Adams et al. 2002 provide detailed discussion (superseding Horsfall 1979, whose evidence is mostly pre-empire and whose analysis ignores comparative studies of modern bilingualism). For further context and bibliography: *OCD* 231–32 (s.v. “bilingualism”). And


Rawson 1985: 98.

Quintilian, *Education in Oratory* 1.12.6.

Marrou 1964: 372-88, with 592-94 notes 11-17 (= Marrou 1956: 254-64, 426-27); also argued in Greene 1994: 30 and documented (though with excessive rancor directed at the pre-Christian period) in Stahl 1962 and 1971, and more soberly in Diederich 1999.


On the role in all this of a declining Latin-Greek bilingualism see Ostler 2007: 58-104, 203-04, 211-12, 246-49.

**Chapter 4**

**Lower Education**


Ps.-Plutarch, *On the Training of Children* 10 (= *Moralia* 7c-8a; moral philosophy: 7d-f; political philosophy: 8a).


Math education: Cuomo 2000: 46-47. On mathematics in Roman education generally see: Marrou 1964: 265-79 (= 1956: 176-85) and Rawson 1985: 156-69. For the broader context of the place of mathematics in the early Roman empire see Cuomo 2001: 143-211; and for the evident widespread need of basic numeracy and practical and applied mathematics in civic life (for which its inclusion in general education must have been essential) see Karin Tybjerg’s survey in Oleson 2008: 777-84. Even just the process of paying one’s taxes required it: see e.g. Wallace 1938 and Nelson 1983. As well as the ubiquitous employment of coinage, weights and measures: Oleson 2008: 759-77.


On the social status of teachers: Harris 1989: 236-38. See Robinson 1921 for a still-useful survey of literary evidence for the social and economic status of Roman schoolteachers; and Laes 2007 for epigraphic evidence (Kaster 1988 treats both but only for late antiquity). Most recently on their lives and social and economic status: Maurice 2013.

Science inadequacy of lower level teachers was observed by Morgan 1998: 3.
Quintilian, *Education in Oratory* 1.4-9 and 2.1.


Asclepiades of Myrlea (1st century B.C.) via Sextus Empiricus, *Against the Professors* 1.91-94 and 1.252-53.


On Aratus see Gain 1976 and Taub 2003: 51-54 and 2010; *DSB* 1.204-05 (s.v. “Aratus of Soli”); *OCD* 132 (s.v. “Aratus (1)”; *EANS* 123-24 (s.v. “Aratos of Soloi”). Numerous commentaries on the poem were produced (e.g. cf. Maass 1958).


On the possibly rarity of Aratus in lower education: Morgan 1998: 43, although Morgan’s source (Haarhoff 1920) is obsolete and pertains principally to the wrong period and place.


On the role of scientific poetry see see Taub 2008.

On the aim of using of education to separate the elite from the *hoi polloi*, see Whitmarsh 2001: 96-108.


On pricing the ancient cost of books: Harris 1989: 195, 224-25 (corroborated by Hezser 2001: 145-46; whereas Winsbury 2009: 19-23 greatly underestimates this cost). Four to five drachmas equals 24 to 30 obols. The ancient equivalent of a ‘minimum wage’ was three obols per day (more or less—there was no fixed standard, cf. *OCD* 1567, s.v. “wages”). As of 2009 the federal hourly minimum wage in the U.S. was $7.25 and the standard full-time work-day consisted of eight hours, for $58 per day. So the modern social equivalent of one obol is in the vicinity of $19. Four or five drachmas thus approximates the value that $450 to $570 would have had to the average U.S. household in 2009, which multiplied by five makes $2250 to $2850, which is well over $2000. Books in codex form were less expensive, but not by enough to make much difference to the present point. Skeat 1982 argues a cost savings of 26%, and though many elements of his estimates and math are questionable (e.g. he greatly underestimates the number of lines that fit in a standard roll), even granting his conclusion would entail a $2000 book could be got for around $1500, hardly a discount of use to the average citizen. Moreover, Skeat fails to count the added expense of binding the codex (whereas this cost is already included in the cost of papyrus rolls, which came pre-bound), so even on his own assumptions his estimated discount is too high (since binding books requires professional skill, as well as considerable time and a variety of materials). And *fine* codices even cost more than scrolls (Nicholls 2010).

See evidence and sources in Millard 2000: 165, who estimates that copying cost “six to ten” drachmas per roll, which is 30 to 50 drachmas (120 to 300 obols) for a five-chapter book, adding as much as $2000 to $6000. Thus even a small book could cost the equivalent of $4000 to $8000. See also Richards 2004: 165-70 who corroborates Millard; and see Cribiore 2001: 146-59 for a detailed discussion of the cost of books vs. more casual writing materials (such as for making notes and sales receipts). On other issues pertaining to the cost and difficulty of procuring books see Marshall 1976, Oleson 2008: 715-39, White 2009, Winsbury 2009, and Bagnall 2009: 256-81.

See also Rowland & Howe 1999: 1 and Cribiore 2001: 146-47. And Starr 1990. For overall context see *OCD* 239–43 (s.v. “books, Greek and Roman,” “books, poetic,” and “books, sacred and cultic”).
On having slaves as teachers: Cribiore 1996.

Aulus Gellius, *Attic Nights* 9.4.1-6. Assuming an average of six books of five rolls each, or thirty rolls, and assuming “a few bronze” as something in the vicinity of half a drachma, that would equal about $110, for an amazing discount of one sixtieth the cost of the papyrus alone. Though some scholars doubt the account of this sale, even as fiction the prices, condition, and buyer’s reaction were probably realistic (as most good fiction aims to be).


Rabanus Maurus, *Homilies* 42.

Oral lectures: Mudry 1986. On the full range of popular sources of oral (and visual) education (mostly political, mythical, and religious in content) see Meggitt 2010: 56-61, 68-70 (with Toner 2010).

Galen, *On My Own Books* Kühn 19.19, 19.21; see also the (possibly) related remark in Galen, *On Venesection against the Erasistrateans at Rome* Kühn 11.194. On the library there, built by Vespasian (in 75 A.D.): Staikos 2000: 111. This library was accidentally destroyed by fire later in Galen’s life (along with his personal collection of books and notes: Galen, *On Conducting Anatomical Investigations* 11.12; and now *On Escape from Grief*, on which: Nicholl 2011, Jones 2009, and Tucci 2008), which would have been around the dawn of the 3rd century. Whether it was restored is unknown.

For sources and scholarship on public lectures see Tountas 2009.

Dio Chrysostom, *Discourses* 33.4-6.


Regular people attending lectures: Galen, *On the Affections and Errors of the Soul* 2.2 (= Kühn 5.64-66).


*OCD* 1089–90 (s.v. “pathology”). On medicine as an issue in court see Amundsen 1978 and 1979, who claims the legal system in Roman Egypt may have been unique in employing doctors forensically (as he proves it did do), but he presents no evidence it was in fact unique there, nor is there any reason to believe it would be.

**Chapter 5**

**The Enkyklios Paideia**

Strabo, *Geography* 1.1.22.

On frequency of attending: Clarke 1971: 6-7. As witnesses Clark references Quintilian (late 1st century, early 2nd century A.D.), Dionysius of Halicarnassus (late 1st century B.C.), Aelius Theon of Alexandria (1st century A.D.), Lucian of Samosata (2nd century A.D.), and Galen (late 2nd century A.D.), to which we can add the remarks of Aulus Gellius (*Attic Nights* 1.9.6-7). Galen often complains of ignorance of advanced mathematics among his peers (e.g. Iskandar 1988: 158, §P.68.14-15, though one could just as easily remark upon the same popular ignorance of geometry and trigonometry today, the very subjects Galen means). Many students nevertheless did study the full curriculum: Clarke 1971: 7, 111; Bonner 1977: 78; Marrou 1964: 265-79, 372-73 (cf. 1956: 183-84); Rawson 1985: 4-5 (and examples below). For a partial survey of some of the scientific content of this curriculum see Marrou 1964: 265-79, 372-73, 410. For general discussion of the content and status of the

Stahl 1962 and 1971 documents a decline in the quality of this education in Latin schools during and beyond the 4th century, although he over-exaggerates the quality of this education before the Roman period. As we shall see in a moment, however, Stahl’s claim that “the only people who seriously promoted the study of all seven liberal arts were philosophers” is false (Stahl 1971: 91). Most philosophers did have a special interest in the mathematical and scientific content of the enkyklios, but so did the most noteworthy professors of rhetoric.


On efforts to classify medicine as a liberal art see Kudlien 1976, but the idea is most eloquently voiced in Plutarch, Advice on Keeping Well 1 (= Moralia 122d-e).

Drawing: Aristotle, Politics 8.2.1337b. See also: Pliny the Elder, Natural History 35.36.77; Plutarch, Life of Aemilius Paullus 6.5; and probably Varro, cf. Rawson 1985: 193, 198.

Galen is describing a Greek’s education in Advice for an Epileptic Boy 2-5, which simply assumes a student went to gym class, whereas we find some distaste for gymnastics in the Latin author Quintilian (as we’ll soon see). On the issue of athletics in ancient education in general see König 2005 and Petermandl 2014.

Some basic principles of algebra might date as far back as the 4th century B.C., cf. DSB 13.399-400 (s.v. “Thymaridas”) and EANS 808-09 (s.v. “Thumaridas (of Paros?)”). Similarly, while basic principles of trigonometry were already developed as early as the 3rd century B.C., plane and spherical trigonometry were fully formalized by Menelaus in the 1st century A.D., cf. DSB 9.296-302 and 15.420-21 (s.v. “Menelaus of Alexandria”), EANS 546 (s.v. “Menelaos of Alexandria”), and OCD 932 (s.v. “Menelaus (3)”), as well as OCD 1507 (s.v. “trigonometry”), with analysis in Russo 2003: 52-55 and Van Brummelen 2009 and 2013. (Modern systems of trigonometry and algebra are entirely different, as both sciences were all but forgotten and had to be reinvented, this time by medieval Indians and Muslims respectively, who improved both before diffusing them to the West. But the ancient systems still worked and achieved the same basic goals.)


Role of geometry: Vitruvius, On Architecture 1.1.4, 1.1.7, 1.1.16.

Musicology: Morgan 1998: 35; cf. Vitruvius, On Architecture 1.1.8-9. That many among the elite had received such an education in the science (and not merely the craft) of music is shown in Barker 1994: 59-60, and (though less thoroughly) in Vendries 2004; note that Vendries incorrectly believes there is no evidence “of an anticipation of
the *trivium...* and the *quadrivium*” in the early Roman period, a conclusion refuted by evidence in our present chapter, as well as by the survey in Stückelberger 1965: 32-44, 46-52 and comments in J. Barnes 1988: 56-57.

On the actual content of astronomy taught in the encyclical curriculum see Evans & Berggren 2006: 8-12 (and for a textbook applying astronomical science to the philosophy of cosmology around the same time see Bowen & Todd 2004).

Varro’s encyclopedia: known in Latin as the *Disciplinae* or the *Disciplinarum Libri IX*. Although this appears to have been the first such book in Latin, it was certainly not the first time Romans were exposed to these subjects, since their bilingual elite had already been familiar with Greek education—many had even studied in Greece—for a century or more before Varro wrote. See Stahl 1971: 96 (and 7: n. 11); Clarke 1971: 2; and DSB 13.588-89 (s.v. “Varro, Marcus Terentius”), *OCD* 1441 (s.v. “Terentius Varro, Marcus”), and *EANs* 774-78 (s.v. “M. Terentius Varro of Reate”). A Latin epitome (or inferior plagiarization) of Varro’s encyclopedia may have been produced in the mid-3rd century by Censorinus, of which fragments survive (see DSB 3.175-76, s.v. “Censorinus,” *OCD* 296, id., and *EANs* 212, s.v. “Censorinus (II”)”). See also: Stahl 1971: 44-53; Rawson 1985: 158-59.

Evidence of considerable knowledge and interest in medical science among educated laypeople in the Roman period is surveyed in Nutton 1985 and 2004: 252-53 (with Ballér 1992 and Durling 1995). Note that an encyclopedia of the arts superior to Varro’s was produced a century later by Aulus Cornelius Celsus, which also included medicine as a subject. We’re not sure of the full range of subjects this treated (we have only scattered hints in Quintilian, *Education in Oratory* 12.11.24, and Columella, *On Agricultural Matters* 1.1.14), but its treatment of medicine is rather superb: see DSB 3.174-75 (s.v. “Celsus, Aulus Cornelius”), *NDSB* 2.81-84 (s.v. “Celsius, Cornelius (Aulus)”), *OCD* 377 (s.v. “Cornelius Celsus, Aulus”), *EANs* 217-19 (s.v. “A. Cornelius Celsus”), with Scarborough 1970: 298-302. For a comparative analysis of the encyclopedic works of Cato, Varro, Celsus, and Pliny, see Doody 2009.

Suetonius, *Virgil* 15.

For some examples of Galen’s inclusion of engineering in an ideal education and of his own considerable knowledge of the subject see Galen, *On the Affections and Errors of the Soul* 2.2-5 (= Kühn 5.64, 5.68-5.69, 5.80-5.91). Galen’s effort to promote a full encyclical education is also reflected in his treatise *Exhortation to Study the Arts*.


Plato, *Republic* 7.525a-531d and 531e-532d.


Quotes from Poulakos 1997. Like Poulakos, Hutchinson 1988 also produces a more accurate analysis of how Plato, Isocrates, and Aristotle really differed (and as often agreed) on the purpose, process, and ideal content of education. Wareh 2012 argues that ongoing debates between Isocrateans and Platonists produced this alignment of interests.


IQ argument: see discussion and sources in Cheyne 2010.


On Cicero’s educational views see Bonner 1977: 81-89.

Cicero, *Brutus* 44.10.

Cicero, *Orator* 15.3 (citing Plato, *Phaedrus* 269e).

Cicero, *Orator* 119.6 (see also *On the Orator* 1.20, 1.72 and 2.5).

On Plato as earliest to divide philosophy into three branches: Dillon 1993: 57.


Cicero, *On Invention* 1.8; *On the Orator* 3.107-10.


Cicero, *On the Republic* 5.5.14 and *On the Orator* 1.15.65-1.18.84.


Quintilian, *Education in Oratory* 1.10-12.


Astronomy: Quintilian, *Education in Oratory* 1.10.46-48; cf. also 1.4.4. The division of astronomy into its mathematical and physical aspects is a phenomenon I’ll discuss in *The Scientist in the Early Roman Empire*, but may have been influenced by the fact that the mathematics could be taught by a geometrician aiming foremost to teach abstract principles while the astrophysical part could be taught by an astronomer aiming foremost to teach specific facts and practices. That both aspects of astronomy were nevertheless a common part of education is further implied by Cicero in *On the Orator* 1.35, 1.128, 1.149, 1.158, 1.187, 2.28. The same implication follows from Seneca’s remarks in *Moral Epistles* 108.1, 114.10-19, 115.1 (and most of epistle 88).

Compare Aristotle, *Politics* 8.2.1337b.

Philo of Alexandria, *On Mating with the Preliminary Studies* 3.9-11, 4.14-18, 14.74-79 (throughout he explicitly
names only six of the standard seven, omitting arithmetic, but he adds arithmetic to geometry and harmonics in
*On the Special Laws* 2.32.200 and *On the Creation of the World* 37.107); and Philo, *On Agriculture* 3.14-4.20
(which also adds natural, moral, and dialectical philosophy in making the same point; cf. also Philo, *On the
Change of Names* 10.70-76). In *Mating* Philo uses the ‘handmaiden’ theme to produce allegorical interpretations
of various biblical passages and stories, especially Abraham’s ‘conjugal’ relations with Sarah and Hagar. For
more on Philo’s views see chapter nine (I will further explore his views in *Scientist*, where I shall also discuss
how Philo’s ‘handmaiden’ idea was later adapted by Christians to subordinate the whole of philosophy to the
gospel, which is also touched on briefly here in chapter nine).

Enkyklios: Cicero, *On the Republic* 1.15.24-1.16.25. Examples of others lauding its value to the state: Valerius

Frontinus, *Stratagems* 1.12 (seven examples involve manipulating the superstitions of soldiers (§ 1, 2, 4, 5, 6, 7, 12);
three examples are of using science lessons to the same end (§ 8, 9, 10)).


On encyclical education see Clarke 1971: 47-49.

Nicolaus of Damascus, *FGrH (Die Fragmente der griechischen Historiker)* 90.F132 (= Suda, s.v. “Nikolaos” [nu
393]).

Cribiore 2001: 180-84.

Other educational aids: Lucian, *Nigrinus* 2; on the use of similar spheres in education see Clarke 1971: 52;
elaborate armillary spheres for use in their lectures (e.g. Theon of Smyrna, *Aspects of Mathematics Useful for
Reading Plato* 3.16.146; I’ll discuss the use and manufacture of such advanced instruments in *The Scientist in
the Early Roman Empire*).


Aulus Gellius *Attic Nights* 1.9.6-7; Quintilian, *Education in Oratory* 1.12.16-18 (with 1.10.3-8); Galen, *On the Uses

Plutarch, *On Listening to Lectures* 2 (= *Moralia* 37f).

Plutarch, *On Listening to Lectures* 10 (= *Moralia* 43a-b).

**Chapter 6**

**Higher Education**

That law was the primary purpose of rhetoric schools is most forcefully argued in Parks 1945, who also advances a
useful running counter-argument against more negative assessments of the ‘Second Sophistic’ (on which see also
notes in chapter four). For a full survey of the aims and content of an ancient education in rhetoric see
Brodie 2004: 2-79). And on law as a profession (for which one certainly needed an education) see Kleijwegt
1991: 165-86.

Eumenius, *For the Restoration of the Schools* (= *Latin Panegyrics* 9), regarding the school at Autun, Gaul, c. 298
A.D. (after the devastating events of the 3rd century). See Cribiore 2007 for similar evidence in Lucian and


Curriculum in Greek: Cribiore 2001: 225-38, 231-44. In Latin: See Quintilian, *Education in Oratory* 1.8.5-12, and 10.1, where the emphasis is on poets, orators, and historians, in that order—though he does include some philosophy, that would not have been common.

Science content: Cribiore 2001: 144.


Ben-David 1984: 42 (though his use of the term “institutions” here may be a bit anachronistic).

Cribiore 2001: 3.

Apuleius, *Florida* 20 Diodorus Siculus, *Historical Library* 2.29.5-6.

Middle Ages: Beaujouan 1963 (with relevant discussion in subsequent scholarship on medieval universities cited here in previous notes).

Critical mass theory: Essentially argued in Rihll 2002: 12-15, Collins 1998: 523-69, Crombie 1963: 9, and Edelstein 1952: 598-99 and 1963: 30-32 (although see my estimate of numbers in chapter three; I’m unaware of any comparable estimate attempted for the Middle Ages or the Renaissance). I will discuss this theory further in *Scientist*.


Complaining about bad teachers: see Tacitus, *A Dialogue on Oratory* 29 (discussed in chapter five) and Galen, *On My Own Books* Kühn 19.9. The latter is certainly hyperbolic, since Galen asserts that Greeks “always” used to be taught letters and grammar, which was certainly never the case.

Bonner 1977: 102-03.

Cribiore 2001 for quotes and content regarding rhetoric school content.

Quintilian, *Education in Oratory* 12.2.4, ibid. 12.2.10, and 1.pr.16.

Quintilian, *Education in Oratory* 12.2.20-23.


Importance of science and natural philosophy in rhetoric schools: Quintilian, *Education in Oratory* 1.pr.16-18.

Chapter 7
Advanced Education

The two school tracks, rhetoric and philosophy, as options in antiquity: Morgan 1998: 193; Bonner 1977: 82-83.

Eclecticism: See Dillon & Long 1988 (briefed in OCD 483, s.v. “eclecticism”); Gottshalk 1987: 1164-71. The best ancient example is the Roman doctor Galen, On the Affections and Errors of the Soul 1.8 (= Kühn 5.42-43; also 2.6-2 = Kühn 5.96-103); on which see Hankinson 1992. The Roman astronomer Ptolemy was likewise an eclectic (Huby & Neal 1989; Long 1988), as was the Roman engineer Hero (Tybjerg 2005). Other good examples of this principle being expressed by Roman intellectuals include Seneca, Moral Epistles 33 and 34, and Diogenes Laertius, Lives and Opinions of Eminent Philosophers 1.21.

On the comparable attitudes of all these sects toward the enkyklion: Rawson 1985: 182. On Hellenistic developments in the demarcation and popularity of philosophical sects leading into the Roman era: OCD 657-58 (s.v. “Hellenistic philosophy”).


Platonist curriculum is illustrated by the textbooks on the quadrivium by Nicomachus (see note in chapter five) and remarks in Roman-era introductions to Platonism, like Alcinous, Epitome of Platonic Doctrine. See also Kalligas 2004, Joost-Gaegier 2006, Remes 2008, Gerson 2013, and OCD 1007-08, 1155-58, 1245-46 (s.v. “Neoplatonism” and “Neopythagoreanism”; “Plato (1)” and “Platonism, Middle”; and “Pythagoras (1), Pythagoreanism”). However, on the probable obsolescence of the “Middle” and “Neo” terminology: Catana 2013. On the role and influence of Pythagorean thought in Roman-era Platonism: Joost-Gaegier 2006.

This is readily apparent in the pervasive body of Aristotle’s works that remained in circulation (and not only his own, but those of his pupils and successors), many of which survive to this day. See also Boylan 1983, Gottschalk 1987, J. Barnes 1995: 105-67, Falcon 2013, OCD 1108 (s.v. “Peripatetic school”), and EANS 142-45 (s.v. “Aristotle”), cf. also EANS 145-53.


Skeptics and science: All this is evident from the extant collected writings of Sextus Empiricus and the philosophical essays of Cicero, although Skeptics disagreed with each other on what to teach regarding the sciences: Edelstein 1967: 165-67. I will treat the relationship between ancient Skeptics and science in more detail in Scientist.


Aulus Gellius, Attic Nights 1.9.6-8.

Plutarch, On Listening to Lectures 11 (= Moralia 43c).

Ethics and science inseparable: For example, Cicero, On the Boundaries of Good and Evil 5.20.57; Maximus of Tyre, Orationes 6, 10, 13, and 27; and it’s a repeated theme in Seneca’s Natural Questions and Galen’s On the Errors and Affections of the Soul.
On the epistemological purposes behind Ptolemy’s *Optics* see A. Smith 1999 and LeHoux 2012 (esp. 106-32); for his extant treatise on epistemology, see Huby & Neal 1989. Sextus the Pyrrhonist, author of *Against the Logicians* in two volumes (= *Against the Dogmatists* 1-2 = *Against the Professors* 7-8), was also a medical scientist of the Empiricist school: *OCD* 1358-59 (s.v. “Sextus Empiricus”). Hero, to give just one example, produces a formal proof of his theorem of least action to explain the laws of reflection in his *Katoptrics*. And Galen’s *Institutio Logica* remains the only real textbook in formal logic to survive from the Roman period (on this and his other writings on logic see Morison 2008).


J. Barnes 1997: 126.

Stoic interest in physics: Barker & Goldstein 1984.


Strabo, *Geography* 2.5.1-2 (cf. 1.1.13).


Galen, *That the Best Doctor Is Also a Philosopher* 3-4 (= Kühn 1.60-63); mathematics and astronomy: ibid. 1 (= Kühn 1.53-54).

Astronomy needed by doctors: Argued in Galen’s *Commentary on Hippocrates’ ‘Airs, Waters and Places’*.

Professional standards: For example, Vitruvius, *On Architecture* 1.1.4 and 6.pr.5-7 (see also Rowland & Howe 1999: 13; Goguey 1978; and Galen, *On the Affections and Errors of the Soul* 2.3 = Kühn 5.68-69).


Astronomers and surveyors expected to be educated: Xenophon, *Memoirs* 4.2.10.

Architect of the Mausoleum’s book: For sources and discussion on the contents of this lost work see *OCD* 1247 (s.v. “Pythius”) and *EANS* 712 (s.v. “Putheos of Priene”). See also Cuomo 2001: 170-73.

Columella, *On Agricultural Matters* 1.pr.3, 1.pr.5.


Theory generates respectability: As argued, for example, in Barton 1994a, Pearcy 1993, and von Staden 1997.

Methods of instruction: Cribiore 2001: 145-46; on all fields in the Roman period see “Professional Education” in Clarke 1971: 109-18; for a school of ‘Egyptian’ medicine before the Roman period, which might have established a model for later scientific schools, see Cribiore 2001: 25.

On the different types of texts used in ancient science education and their relation to oral instruction see Taub 2008: 13-29 (and for another example see Nicholls 2010).


On the nature and content of astronomy education in antiquity see Evans & Berggren 2006. On mathematics

Astrology was an art taken quite seriously at the time, although not by everyone: see Barton 1994b (and 1994a) and OCD 187-88 (s.v. “astrology”); for ancient arguments pro and con see Long 1982 and Sextus Empiricus, Against the Professors 5. All Epicureans and Skeptics rejected astrology, but so did others; even the occasionally gullible Pliny the Elder: cf. Natural History 2.6.28-29. Nevertheless, astrology was not only lucrative and popular, it also typically demanded real scientific expertise in astronomy (on which besides Barton, see A. Jones 1994).


Students attending doctors and engineers at work: E. Evans 1994.

Galen, On the Affections and Errors of the Soul 1.8 (= Kühn 5.41-42); On My Own Books Kühn 19.39-43 (where Galen also says his father learned mathematical subjects from his grandfather and great-grandfather, suggesting a family tradition in the engineering profession). Supporting the inclusion in Galen’s education of rudiments of trigonometry (spherics and conics, including some knowledge of the production of conical sundials), see Galen, On the Affections and Errors of the Soul 2.1 (= Kühn 5.59-60). On Galen’s use and knowledge of mathematics and mathematical sciences in his works and methodologies in general see Lloyd 2005. For important examples see: Galen, On My Own Books 11 (= Kühn 19.40), On the Affections and Errors of the Soul 2.3-7 (= Kühn 5.66-103), On Treatment by Venesection 3 (= Kühn 11.255-56), On the Doctrines of Hippocrates and Plato 8.1.19-21 (with 9.4.30-31), On the Therapeutic Method 1.4.4-6 (with 1.4.12 and 1.5.1, and related notes in Iskandar 1988: 158 (§P.68,14-15)). For examples of Galen’s astronomical knowledge and interests see Strohmaier 1993 and especially Galen’s Commentary on Hippocrates' “Airs, Waters and Places”. For his knowledge and interest in these, and other sciences as well, see Nutton 1999: 169-70 (§P.82,19).


Galen, On My Own Books (especially = Kühn 19.52-61). See also Hankinson 1994: 1782-84.


Galen’s On My Own Books is full of references to public anatomical and surgical demonstrations. See also Galen, On the Uses of the Parts 15.1 (= May 1968: 658) and On Examinations by Which the Best Physicians Are Recognized 9.6.
Plutarch, How to Tell a Flatterer from a Friend 32 (= Moralia 71a).

Dio Chrysostom, Discourses 33.6.


For more on Vitruvius see DSB 15.514-21 (s.v. “Vitruvius Pollio”), OCD 1561-62 (s.v. “Vitruvius (Pol(l)io”)”, and EANS 830-32 (s.v. “M. Vitruuius Pollio”).

Galen’s Exhortation to Study the Arts contains enough uncanny coincidences with remarks in Vitruvius’ On Architecture that Galen must have read and liked it (or else some Greek work Vitruvius followed quite faithfully, as some scholars suggest he did). Compare, for example, Exhortation 5 and 8-9 (= Kühn 1.15, 1.20) with On Architecture 6.pr.1, 6.pr.4., and 9.pr.1-2.

Vitruvius, On Architecture 6.pr.4.

Vitruvius, On Architecture 6.pr.5 mentions again his having several teachers, who taught him professional ethics as well as the skills of his field, and 9.1.16 mentions his learning astronomy from several teachers.

Vitruvius, On Architecture 6.pr.3 (repeated in Galen, Exhortation to Study the Arts 8, = Kühn 1.15). For something of the underlying sentiment see Xenophon, Economics 20.15.


Galen, On Conducting Anatomical Investigations 2.1 (= Kühn 2.280-83).

Vitruvius, On Architecture 6.pr.6-7.


Vitruvius, On Architecture 1.1.4-10 (mechanics is added in 10.pr.3).

Vitruvius, On Architecture 1.1.7.

Vitruvius, On Architecture 1.1.8-9 and 5.4-5.

Vitruvius, On Architecture 1.1.10; on lead pipes: 8.6.10-11.

Vitruvius, On Architecture 1.1.4.

Vitruvius, On Architecture 6.2 and bks. 3, 4, and 6; on this point see also Athenaeus the Mechanic, On War Machines 28.5-12, along with Whitehead & Blyth 2004: 139-40.


Vitruvius, On Architecture 1.1.3 (cf. 1.1.13).

Vitruvius, On Architecture 1.1.11-18.

Vitruvius, On Architecture 1.1.17.
Vitruvius, *On Architecture* 1.1.1-2, 1.1.11.


Strabo, * Geography* 4.1.5.

Zilsel 1945: 342. See quotation of McGrayne 2011: 63, and my related discussion and notes in chapter one.

Chapter 8

State and Public Support for Education


For some social and cultural analysis of this trend, drawing on inscriptions and literary sources, see Nilsson 1955. As just a few examples, inscriptions attest educational foundations for the citizens of Xanthus (SEG 30 [1980] no. 1535.24-28) and Teos and Miletus (SIG 2.577-78).


Athenian school for boys: Tod 1957: 137, 139.


On all these facts: Harris 1989: 130-33, 141-44, 283, 307; Cribiore 2001: 63-64; Cuomo 2001: 30-32, 34-37, 39-40, 43-44; Clarke 1971: 8; Marrou 1964: 431-39 (= Marrou 1956: 301-08); P.J. Parsons 1976 (esp. pp. 410-14 and Appendix II: 441-46). On possible motives for the disparity in support between secondary and elementary education, see Christes 1988. One indirect exception may be certain charities that subsidized living expenses (discussed in chapter two), which could have made primary education more affordable to thousands.


Its extension: See for example Lewis & Reinhold 1990: 2.206-08 (§56). Nutton argues the tax and other exemptions for doctors can be dated as far back as Julius Caesar (cf. Nutton 1985: 29, 2000a: 964 n. 63, and 2004: 249-50), although Cassius Dio, *Roman History* 53.30.3 places their origin under Augustus. Imperial privileges awarded to professors are discussed in Marrou 1964: 440-43, Bowersock 1969: 30-42, Nutton 1971b, Cuomo 2000: 31-37, and Perrin-Saminadayar 2004. The whole of *Digest of Justinian* 27.1.6.1-12 documents that doctors, rhetors, philosophers, grammarians, and law professors were all granted exemptions at least as early as the mid-second century A.D., while *Digest of Justinian* 50.4.18.30 suggests they existed as early as Vespasian (in the 70s A.D.).


Doctors paid to teach: See *Digest of Justinian* 27.1.6.9.


‘Aelius Lampridius’, *Life of Severus Alexander* 44.4.


Marrou 1964: 434-36 (= Marrou 1956: 301-03) and *Digest of Justinian* 27.1.6.2, reporting an interpretation of the third century Roman jurist Herennius Modestinus of the second century decision of emperor Antoninus Pius.

*Digest of Justinian* 27.1.6.4. On all the above aspects of Roman imperial support for doctors see Jackson 1993: 80-84 and Scarborough 1970: 297.


*Digest of Justinian* 27.1.6.7 (in the context of 27.1.6.5-9), which also suggests philosophers were expected to teach for free, or at least not to complain if their students failed to pay (a point supported by *Digest of Justinian* 50.13.1.4).


Suetonius, *Vespasian* 17-18; Cassius Dio, *Roman History* 65.12.1. Suetonius does not say how many or where, but possibly only one of each and at Rome. See discussion in Woodside 1942.

See OCD 974-75 (s.v. “museum”).


On the Athenian Museum see Oliver 1977.


On the lost history of the institution (*On the Museum at Alexandria*) written by Aristonicus (*OCD* 157, s.v. “Aristonicus (2)”; likewise *On Alexandria* by Callixeinus of Rhodes (*OCD* 268, s.v. “Callixeinus”); only fragments (see Christian Jacob’s contribution to König, Oikonomopoulou, and Woolf 2013: 57-81). But extant papyrological evidence includes: *P. Merton* 19 (in 173 A.D. Valerius Diodorus was ‘ex-vice librarian and member of the Museum’), *BGU* 3.729 and *P. Ryl* 2.143 (144 and 38 A.D., examples of men granted the right to dine for free at the Museum for life), *P. Kron*. 4 (135 A.D. discusses certificates of membership at the library in
Alexandria); see also Tod 1957: 138, Lewis 1963, and Turner 1980: 86-87 for more examples. Literature confirms these observations (see following note on the Library of Alexandria). And we have at least one inscription, declaring that in 56 A.D. Tiberius Claudius Balbillus was appointed head “of the Museum and Library of Alexandria,” cf. Forschungen in Ephesos 3 (1912): 128.


Athenaeum: See Boatwright 1987: 202-08.

Tod 1957 for more discussion and examples.

The possibility that many provinces were favored with similar set-ups is by itself plausible, but also suggested in the (albeit not always reliable) Augustan History (= ‘Julius Capitolinus’, Life of Antoninus Pius 11.3; and possibly implied in ‘Aelius Spartanus’, Life of Hadrian 16.8).


Problem of unattested regions: For example, Hanson 1989.


This inscription even includes part of the catalogue of the library’s collection: Gamble 1995: 182 and Marrou 1964: 285 (= Marrou 1956: 188).

On using private libraries of one’s patrons and friends: See discussion in Marshall 1976.


Cassius Dio, Roman History 60.26.

Diogenes of Oenoanda, Epicurean Inscription = M.F. Smith 1996 (cf. OCD 457, s.v. “Diogenes (5),” and EANS


Chapter 9

**Jewish and Christian Education**

Lapin 1996: 505 (cf. 505-08).

Acts 4:1-6. The word *agrammatoi* literally means “without letters,” hence unable to read or write (*LSG* 14, s.v. “agrammatos”), while *idiôtai* means without professional training or knowledge (see note in chapter two).

That the apostles were probably highly educated: Carrier 2014: 263-64, 440.

John 7:14-18. The mention of Jesus drawing something on the ground in John 8:6-8 is ambiguous and generally regarded as not even original to the Gospel of John (called the *pericope adulterae*, it has been identified as a later interpolation). It cannot be known on present evidence if Jesus, granting that he was historical at all, could read, since the authors of the Gospels, believing Jesus was divine, might simply assume a god could read. But if Jesus was an actual Rabbi (Mt. 26:25, 26:49; Mk. 9:5, 11:21, 14:45; Jn. 1:38, 1:49, 3:2, 4:31, 6:25, 9:2, 11:8), he would almost certainly have been literate—and therefore probably (in reality) from a family of some means, regardless what the Gospels claim.

On the higher status of Bible scholars among the elite: Marrou 1964: 454-55, 616 notes 6-7 (= Marrou 1956: 316-17, 445). On debates surrounding the meaning and provenance of the following passages see Rubenstein 2003, pp. 200-201, esp. n. 68.

Quotes from b.Talmud, *Pesachim* 49a-49b.


Gamble 1995: 6-8. An even bolder case is made in Safrai 1969, but Safrai’s account of Jewish education is wholly unreliable and his discussion of the evidence often wildly inaccurate.


Schools only religious content and not in Greek: Lapin 1996: 498-511; Gerhardsson 1961: 56-66 and 85-92; and conceded even by Millard 2000: 158.


There were certainly Jewish scientific doctors: see Kudlien 1985 and Rosner 1994.


For a detailed treatment of Philo’s views on education, see Sandnes 2009: 68-78.


See Philo, *On Dreams* 1.10.(52-60).

Christianity as syncretism: See Klauck 2003; Carrier 2011 and 2014; Fox 1987.

No other schools to learn in: Corroborated by Sandnes 2009: 5-7.

For a discussion of education metaphors in the New Testament (and an important analysis of Paul’s latent hostility to higher education) see Judge 1983.

Paidagogus: *LSG* 1286, s.v. “paidagōgos.”


Hippolytus, *Apostolic Tradition* 2.16.5.


Quoting *The Catholic Teaching of the Twelve Apostles* 1.6, here modernizing an older English translation (from the extant Syriac translation of the Greek original, which may date back as far as the second century) in Connolly 1929: 12; cf. *ODCC* 479 (s.v. “Didascalia Apostolorum”). See Sandnes 2009: 102-10.


Origen, *Against Celsus* 3.55. Note that this Celsus is likely the Epicurean friend of Lucian (addressed in Lucian, *Alexander the Quack Prophet* 1-3 and 60-61; cf. Origen, *Against Celsus* 3.35), but probably not the same as the engineer of the same name and similar date, and certainly not the same as the encyclopedist Aulus Cornelius Celsus, who dates a century earlier.

Origen, *Against Celsus* 3.56-58.


Ptolemy’s epigram survives in the *Palatine Anthology* 9.577. Galen said essentially the same thing of a medical education, e.g. Galen, *On the Uses of the Parts* 3.10 and 17.3 (= May 1968: 189-91, 733).

Christian hostility to education a reversal of pagan praise: See the analysis of Copan 1998.

Lactantius, *Divine Institutes* 3.25.


Justin Martyr, *Dialogue of Justin and Trypho the Jew* 2.


Eusebius, *History of the Church* 5.28. See discussion in Walzer 1949: 75-86 and for background see *ODCC* 1242 (s.v. “Paul of Samosata”).

For background on Origen see *OCD* 1047-48 (s.v. “Origen (1) (Origenes Adamantius)”) and *ODCC* 1193-95 (s.v. “Origen” and “Origenism”). See also Jacobs 2011 for Christian debate over the value of Origen’s educational ideals in the 4th century; and Gemeinhardt 2012 on the Origen-Gregory correspondence and its relation to evolving educational values in Christianity.

Little is known of the Alexandrian curriculum, but for discussion of what might have went on at that Christian school at Alexandria see van den Broek 1995 and Osborn 2005: 19-24.

The attitudes of these two schools to education (judging from the works of Origen of Caesarea and Clement of Alexandria, respectively) are well analyzed in Sandnes 2009: 124-59.

Gregory Thaumaturgus, *Panegyric Oration on Origen* 1 and 5. There is some dispute as to the actual identity of this author, but his identification with Gregory the Thaumaturge is supported by Eusebius (*History of the Church* 6.30), who was using Origen’s library at the time (Carriker 2003) and thus would be in a good position to know, while arguments against the attribution are not very persuasive. Whatever his name, the author was certainly a student of Origen writing in the middle of the third century. See Trigg 1998: 36-37 and 249 (n. 6); and Crouzel 1979 and 1969; with *OCD* 636 (s.v. “Gregory (4) Thaumaturgus”) and *ODCC* 713-14 (s.v. “Gregory Thaumaturgus, St.”).


Origen, *Homilies on Leviticus* 7.6.6-8.


Origen, *Commentary on the Song of Songs* pr.3 (cf. Lawson 1957: 39-46, 317-20). As for the other two branches, Origen says Abraham represents ethics because of his obedience to God and Jacob represents metaphysics or theology because of his ladder to heaven. Similarly, Origen elsewhere identifies the Biblical Ahuzzath as symbolizing physics because his name means “he who holds,” and natural philosophy contains or ‘holds’ everything in nature (in the context of Origen, *Homilies on Genesis* 14.3, where he first says Abimelech represents logic, and his two subordinates, Ahuzzath and Phicol, represent physics and ethics, respectively).


Gregory Thaumaturgus, *Panegyric Oration on Origen* 13 (cf. 11-15). Other schools (like Pythagoreanism) were by that time either nonexistent or too scarcely represented to have mattered educationally, or (like Cynicism) already spurned natural philosophy. On Origen’s fondness for Platonism: Edwards 2012.

See Carrier 2010.

Plutarch, *Marcellus* 14.7-12 and 17.5-7.


Augustine, *The Literal Interpretation of Genesis* 1.19, 1.20 and 2.9.


Clement of Alexandria, *Stromata* 1.5 (§29.9), where he also draws on Philo (whose views we examined earlier).

Clement of Alexandria, *Stromata* 1.9, 6.11.

On modern science being a re-paganization of Christianity: see discussion and sources in Carrier 2010 (esp. pp. 412-19).

**Chapter 10**

**Conclusion**

For general background see *OCD* 861 (s.v. “Lucian”).

Lucian, *On the Dream* or *Lucian’s Career* 1, 7, 10.

Horace: see *OCD* 704-07, in s.v. “Horace (Quintus Horatius Flaccus)”.


Galen, *On the Affections and Errors of the Soul* 2.2 (= Kühn 5.64-66). Galen composed an abbreviated version of this same point in *On the Natural Faculties* 3.10 (= Kühn 2.178-80). For similar arguments elsewhere see Galen, *On the Doctrines of Hippocrates and Plato* 2.3.12-17 and *On the Uses of the Parts* 10.12, 10.14, 12.6 (= May 1968: 490, 502, 558-60).


This culture war has been examined in regard to pagan and Christian attitudes toward miracles in Grant 1952 and Remus 1983; and in other respects by Fox 1987 and MacMullen 1984 and 1997.


Claim about Romans, for example: Diederich 1999: 66-67.

See Witty 1974 (although incomplete and outdated). On encyclopedism as in fact a pre-Roman fad beginning in the very heyday of Alexandrian science, see two chapters on the subject in König & Woolf 2013: 23-83. On the phenomenon in the Roman period: Doody 2009.

The continued advance of scientific research through the early Roman Empire is briefed in Carrier 2010; it’s abandonment thereafter becomes clear by comparison. I will demonstrate this in *The Scientist in the Early Roman Empire*. 
Bibliography

Abbreviations commonly used in notes:

$DSB = Gillispie 1980$

$EANS = Keyser & Irby-Massie 2008$

Kühn = Kühn 1821-1833$^1$

$LSG = Liddell & Scott 1996$

$LSL = Lewis & Short 1879$

$NDSB = Koertge 2008$

$OCD = Hornblower & Spawforth 2012$

$ODCC = Cross & Livingstone 1997$


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$^1$ There is no consistent numbering system for passages in Galen other than (in most cases) Kühn 1821-1833, which I give whenever possible. If I provide any other numeration it will follow the scheme used in the most recent English translation prior to 2008.


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