"Let no one ignorant of geometry enter here."

A Question

What **precisely** was written over the door of Plato's Academy?

Plato's Academy

Academy was a suburb of Athens, named after the hero Academos or Ecademos.

Plato's Academy

It appears that the Head of the Academy was elected for life by a majority vote. The first few to lead the Academy were: Plato, Speuisppus, Xenocrates, Polemon, Crates and Crantor.

Aristotle was a member of the Academy for many years but never became its Head.

We should note, however, that Cicero, writing in the first century BC, traces the Academy back earlier than Plato and gives its leaders up to 265 BC as: Democritus, Anaxagoras, Empedocles, Parmenides, Xenophanes, Socrates, Plato, Speusippus, Xenocrates, Polemo, Crates, and Crantor.

(St. Andrews Website)

Plato's Academy

Philo left Athens in about 85 BC and went to Rome. About a year earlier Lucius Sulla had marched an army on Athens. During the siege of Athens many of the trees in the Academy park were cut down to provide timber for the war effort but there is no evidence that by this time the school led by Philo had any connection with the Academy parkland. <u>It appears that after Philo left Athens the activity in the school ended and there is little evidence that it was restarted before the 2nd century AD.</u>

(St. Andrews website)

Plato's Academy

The usual suggestion that Plato's Academy existed from 387 BC until Justinian closed it down in 529 AD is, therefore, not only inaccurate because it appears that there was no Academy from 85 BC until the 2nd Century AD but also because the Academy continued to exist after Justinian's edict to close the pagan schools.

Damascius was Head of the Academy in 529 AD and he left Athens at this time with Simplicius and other members of the school. However Simplicius returned to Athens where he certainly wrote, undertook research and was Head of a very restricted Academy until his death in 560 AD.   (St. Andrews website)

Plato's Academy

... Plato's influence on mathematics was not due to any mathematical discoveries he made, but rather to his enthusiastic conviction that the study of mathematics furnished the finest training for the mind and, hence, was essential for the cultivation of philosophers and those who should govern his ideal state. This explains the renowned motto over the door of his Academy:

"Let no one unversed in geometry enter here".

Because of its logical element and the pure attitude of mind that he felt its study created, mathematics seemed of utmost importance to Plato; for this reason, it occupied a valued place in the curriculum of the Academy.

Plato's Academy

All the authorities agree that he [Plato] made a study of geometry or some exact science an indispensable preliminary to that of philosophy. The inscription over the entrance to his school ran

"Let none ignorant of geometry enter my door,"

and on one occasion an applicant who knew no geometry is said to have been refused admission as a student.

Plato's Academy

... At any rate, in later years he is said to have placed above the entrance to his school of philosophy (the Academy) the words, "Let no one ignorant of geometry enter my doors,"[3] – the oldest recorded entrance requirement of a college, - and to have spoken of God as the great geometer.[4]

[3] Μηδείς άγεωμέτρητος είσίτω μον τήν στέγην.

[4] "God eternally geometrizes," Άεί θεός γεωμετρεῐ. This is not in Plato's works, but is stated by Plutarch as due to him. Plutarch, *Convivalium Disputationum libri novem*, viii, 2 ed., Didot (Paris, 1841).

Plato's Academy

... Plato's Academy, founded in Athens around 385 B.C.E., drew together scholars from all over the Greek world. These scholars conducted seminars in mathematics and philosophy with small groups of advanced students and also conducted research in mathematics, among other fields. There is an unverifiable story, dating from some 700 years after the school's founding, that over the entrance to the Academy was inscribed the Greek phrase ΑΓΕΩΜΕΤΡΗΤΟΣ ΜΗΔΕΙΣ ΕΙΣΙΤΩ, meaning approximately

"Let no one ignorant of geometry enter here."

A student "ignorant of geometry" would also be ignorant of logic and hence unable to understand philosophy.

Plato's Academy

... it is certain that Plato brought in the best mathematicians of his day to teach and do research, including Theaetetus (c. 417-369 B.C.E.) and Eudoxus (c. 408-355 B.C.E.).

The most famous person associated with the Academy, however, was Aristotle.

Plato's Academy

From Smith, Μηδείς άγεωμέτρητος είσίτω μον τήν στέγην

From Katz, ΑΓΕΩΜΕΤΡΗΤΟΣ ΜΗΔΕΙΣ ΕΙΣΙΤΩ

Moritz, *On Mathematics: A Collection of Witty, Profound, Amusing Passages about Mathematics and Mathematicians* (Dover, 1958) gives Smith's version and cites *Tzetzes, Chiliad, 8, 972*

... Now (Bill says:) I'm in a pickle, there seems to be some disagreement about the actual wording and I don't have a reference for the Katz version.

Plato's Academy

I decided to search the web.

I came across this webpage:

http://php.iupui.edu/~cplaneau/plato_02.html

Christopher Planeaux's webpage on Plato's Academy cites the Katz version with Phlp. *In de An*., cxvii 26-7 and Olymp. *Proll*., viii 39 – ix 1.

 ...but unfortunately, I don't know what these abbreviations mean. So I decided to e-mail Planeaux and ask for some clarification.

Plato's Academy

We should look at perhaps the only 'fact' which is usually given about the Academy in Plato's time. This is that above the door Plato inscribed

"Let no one who is not a geometer enter".

This is not stated in any literature which has come down to us earlier than a document from the middle of the 4th century AD which, therefore, was written about 750 years after Plato founded the Academy. Before we discuss whether it is likely that indeed this was written above the door of the Academy, let us give what is probably a more accurate translation -

"Let no one who cannot think geometrically enter".

First we note that above the doors of sacred places there was often placed an inscription "Let no unfair or unjust person enter". What is reported above the door of the Academy are exactly the same Greek words except "unfair or unjust" have been replaced by "non-geometrical".

Plato's Academy

"…about 750 years after…"

???

SO…

THERE PROBABLY WAS NOTHING OVER THE DOOR.

IT IS A NICE STORY.

The actual evidence

The earliest reference occurs in an oration written by the emperor **Julian the Apostate** in **362**, who mentions an inscription over the entrance to Aristotle's classroom and alludes to another over Plato's, without giving any details of their contents. (No other reference to Aristotle's inscription is known.)

The first details of the wording of Plato's inscription come from an anonymous scholiast who has been identified as probably the 4th century orator **Sopatros**, in an annotation of a manuscript of Aelius Aristides.

(David Fowler, The Mathematics of Plato's Academy: A New Reconstruction, Oxford: Clarendon Press, 1999)

Scholia

Annotation

Scholium
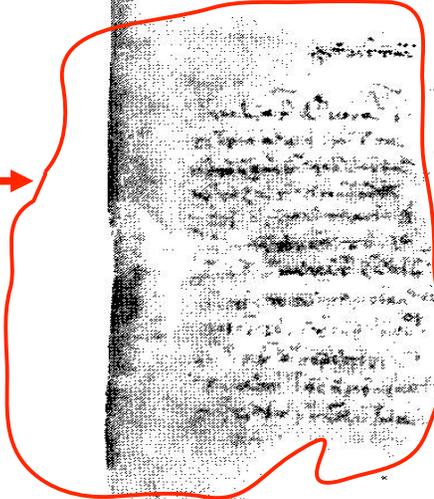
Inserted Figure
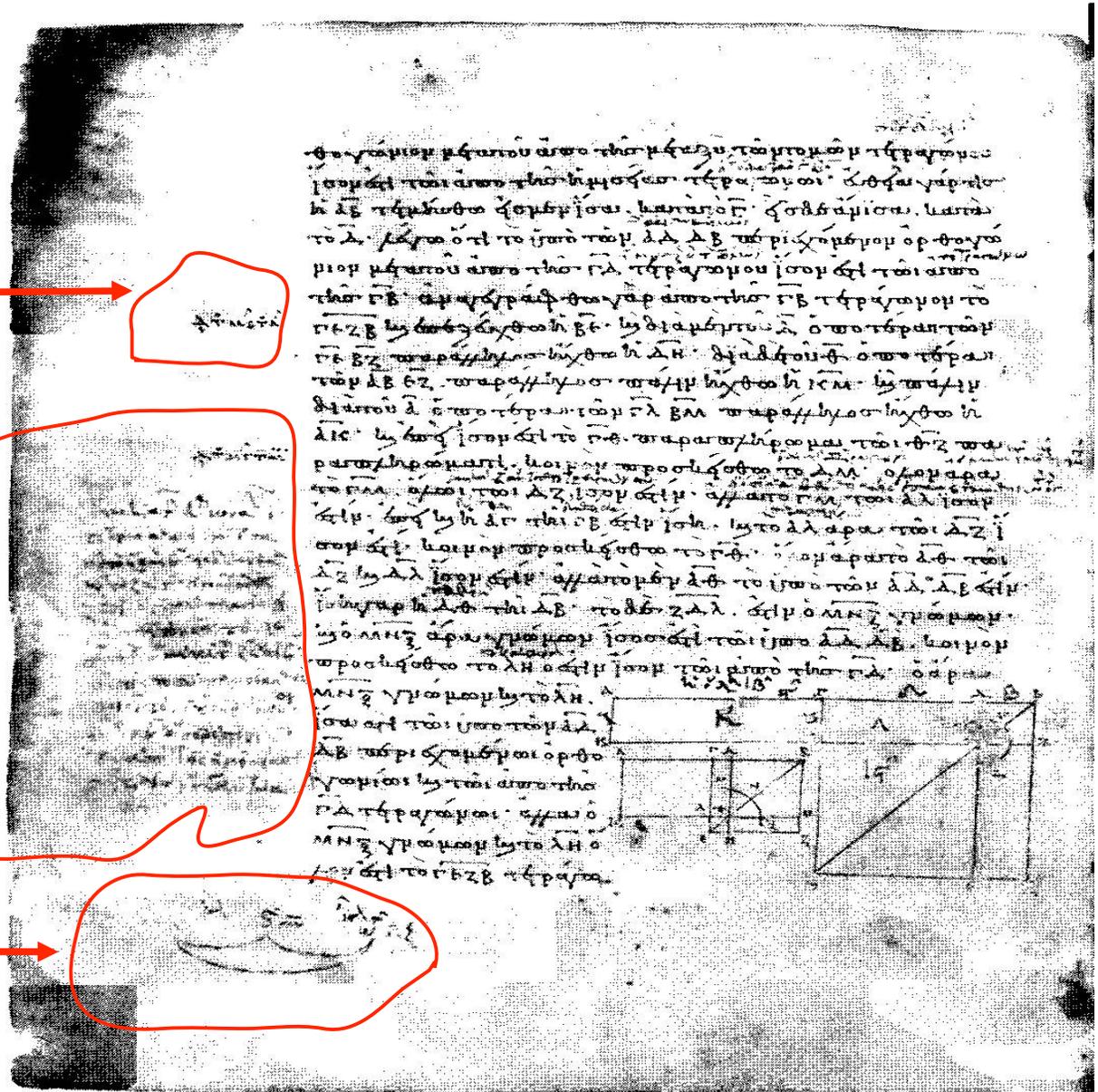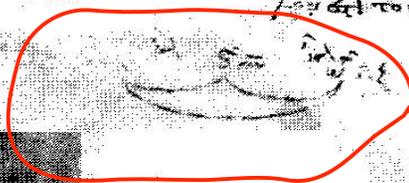
The Scholium

εί δέ ή γεωμετρία έπεγέγραπτο δέ έμπροςθεν τής διατριβής τοΰ Πλάτωυος ότι ΑΓΕΩΜΕΤΡΗΤΟΣ ΜΗΔΕΙΣ ΕΙΣΙΤΩ. άυτί άυίςος καί άδικος. ...

Which translates to [Andrew Barker, *transl*.]
  There had been inscribed at the front of the school of Plato. "Let no one who is not a geometer enter". [That is] in place of 'unfair' or 'unjust': for geometry pursues fairness and justice.

Note that the scholium does not say
that Plato put it there.

The Stories

The story is repeated and used by the 6th century Alexandrian neo-Platonic philosophers Philoponus, Olympiodorus, Elias, and David to impute a variety of different motives to Plato in having the inscription put up in the first place. Finally, the most commonly used standard source for the story is the 12th century Byzantine Johannes Tzetzes.

From Fowler who uses the article by Saffrey as a source.

So …
Let's talk about SOURCES

It is important to consciously distinguish between THREE different kinds of sources:

Sources

Primary sources are the original writings from the period under study. In the history of mathematics, an article by D'Alembert, a book by Euler, a historical account in Montucla's book would all be primary sources.

Secondary sources are scholarly works based on the primary sources. This would include articles in *Isis, Historia Mathematica*, and so on, moreso than books.

Tertiary sources are expository accounts based on the secondary sources. Often articles in more popular publications are of this kind. Pages on the web are also often of this kind if not further down the chain.

Limitations

While it is nice to say that one should use primary sources, in practice this is not always possible. In some cases, primary sources either don't or no longer exist.

In other cases they may be unreadable to us, either because the language has changed too much or because they are written in languages we don't read.

In the latter situation, we must rely on translations of the primary sources and the quality of these depends on the abilities of the translator.

Limitations

Unless we are willing to spend the time to learn the needed skills, we must depend on the work of others who have those skills.

In general, we are not in the position of being able to judge the quality of such work, but we can at least recognize the fact that such work has occurred and acknowledge it when we can.

Sources

So the material on which you will base your research will probably consist mostly of secondary sources.

Be very careful when using tertiary sources: *they may be unreliable*.

It is probably better to use such sources mostly as pointers to secondary sources that you can then use with a bit more confidence. If you have access to the relevant primary sources, then make sure to make use of them; by looking at the primary sources yourself you have the chance to propose an original interpretation, to correct wrong perceptions, or simply to get a feeling for the flavor and tone of the original texts.

Sources

You will need to put a lot of effort into locating the right sources for your research, using electronic indices, published bibliographies, sourcebooks, and references in articles and books you already have access to.

Using the Web

Prof. Daniel Otero of Xaiver University, who teaches History of Mathematics, writes:

There are several sites which are particularly valuable to students in this course. Be warned that care must be exercised when using information you have obtained from the Web. Consider sources. Is the site based at a trustworthy location such as a university or government department?

Are the documents written by scholars and experts, or by dilettantes and cranks?

Using the Web

It is important to actively make judgements about the reliability of what you read on the web. There are limitations on web research. And there are huge affordances!

While there are valuable gems that can be found on the web, there is also a whole lot of chaff and you must develop the ability to distinguish between the two, in order to be able to use the web effectively.

Using the Web

What questions do you have?