MIKLÓS MARÓTH

AN UNKNOWN XENOCRATIC TESTIMONY

To Shaul Shaked on his 70th birthday

Summary: The paper examines a fragment of Xenocrates on definition preserved by Alfarabi. Proving that the exposition of Plato’s and Aristotle’s definitions in the same fragment reflect the views of the philosophers referred to in late antique wording the author accepts Alfarabi’s report as reliable and authentic. Further comparison of Alfarabi’s passage with late antique logical views results in the statement that Xenocrates’ definition was connected with the emerging doctrine of relational syllogisms. Alfarabi’s fragment exposition of Xenocrates’ hitherto unknown teaching is, consequently, exposed as part of the late antique philosophical tradition.

Key words: Plato, Aristotle, Xenocrates, Alfarabi, definition, relational syllogisms.

1. DESCRIPTION OF THE TEXT UNDER EXAMINATION

In his short commentary on the Analytica deuetera al-Fārābī1 dwelt on the issue of definitions at length. There is nothing surprising about this as the Analytica deuetera has long been known to have treated the subjects of proofs and definitions.

Discussing the question of definitions al-Fārābī noted that three useful methods had come down to him from ‘the elders’ and were adopted, out of the several relevant theories. The first one came from Xenocrates. He thought the definition of a given entity could be arrived at syllogistically. The essence of the second method was identified as division. It was said to have come from Plato. The third one, the so called synthetic method, was worked out by Aristotle.2

If al-Fārābī had stopped in his exposure of the subject at this point, he would have caused us quite a bit of inconvenience. Fortunately, however, he added a few details and examples to his short statements.

Al-Fārābī thought that if, in the case of the Xenocratic definition, one aims to prove that a certain definition belongs to a particular thing, a middle term (terminus

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2 op. cit. 331.

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medium) is needed. This middle term also serves as a definition for the thing in question. However it is known that with evidential syllogisms the middle term plays the role of cause, and cause has a precedence over the generic concept, so the definition taking the place of the middle term must have preceded the definition occupying the place of the generic concept.\(^3\)

This description is followed by an example: proof is to be provided for man’s being ‘a living creature walking on two legs’. In this case the ‘preceding’ definition in the place of the terminus medium could be a ‘thinking mortal [living being]’. If the definition taking the place of the terminus medium itself needs to be proved, there must be a third definition, which is of even less recent origin than the ‘preceding’ one that has taken place of the terminus medium, and can thus serve as a proof for it, and so on, and so forth. If all that is not feasible, the existence of a primary definition requiring no further proofs is bound to be postulated.\(^\text{5}\)

All rational, mortal animal is walking on two legs
All man is rational mortal animal
All man is walking on two legs

And this can be continued as described in al-Farâbî’s Arabic text. But the question arises as to whether or not this locus is authentic and whether it can be proved that this is what Xenocrates had taught about definitions. The question should be raised all the more because Aristotle himself clearly stated that definitions belong to the set of principles and cannot be proved syllogistically.\(^\text{5}\) At the same time Aristotle also said that one thing can only have one definition.\(^\text{6}\) The essence of the Xenocratic teaching, on the other hand, is that one thing may have several definitions.

\(^{3}\) loc. cit. Again, universa a praedico a medio, sive positione, sive causa, sive praedico a medio.

\(^{4}\) loc. cit. 301: Si medium non est mediatum, non est terminus.

\(^{5}\) Aristotle: Anal. post.93 b 15–17: οὐκ οἷς τοῖς χάριτι λαμβάνεται τὸ τί ἐστι καὶ γίγνεται γνώριμον, εἰρήμα, ὡς τὸ σύνηλεσμός μὲν τοῦ τί ἐστι σοὶ γίγνεται οὐδὲ ἀπόδειξις, δήλων μὲν διὰ σύνηλεσμὸς καὶ ἀποδείξεως.

\(^{6}\) Aristotle: Top. 154 a 10–11: οὗτος γὰρ ἐν τῷ διὸν ὀφέλει διὸ τοῦ αὐτοῦ ὁ ρῆμα δυνατὸν ἔστιν εἶναι.

_Acta Ant. Hung._ 42, 2002
The simplest procedure in this case is to see whether the collection of Xenocrates’ known fragments contains anything that confirms al-Fārābī’s words. The answer is simple: There is not one among Xenocrates’ known fragments to help either prove or deny everything that the Arabic text contains.

Now there is nothing else left for us to do but check what can be checked, that is, the account of Plato and Aristotle, and whether al-Fārābī’s words hold true for them or not. Furthermore it must be examined whether Xenocrates can be visualised as having worked out teachings opposed to Aristotle’s words, by way of comparing them to the teachings of logic from post-Aristotelian times.

2. OBSERVATIONS ABOUT PLATO AND ARISTOTLE

Plato said, if one wants to define something, one should first see which genus it is subordinated to. If something else is nearer to it than its uppermost (previous) genus, then the other (nearer) genus should be considered. If there is no such other genus, its uppermost (first) genus is to be taken. It then is to be divided by the two primary oppositional differences. Then it should be seen which of the two the thing to be defined falls below. If it is found below one of them, it must be examined whether the genus and the difference together are equal to it. If they are, the definition has been found. If they are broader, then they have to be divided by two new oppositional differences. This is to be carried on with a series of newly arising differences. It may need to be examined whether or not it is the individual entity falling under the concept thus gained that is to be defined. If it is, the definition will consist of a genus plus the differences listed in the correct order.

As for the Aristotelian definition, arrived at synthetically, it may be obtained in the following way. The individual entities that we are aiming to define will be examined first. Take the predicates that can be associated with the individual entities and see if those predicates can be stated about the quiddity of the individual entities. When all these have been collected, it should be examined which of the predicates can be considered as a genus/genera and which ones cannot. Then the genera are to be compared and arranged proceeding towards the more and more general. In the course of these activities it can be found which genus is the most specific. Then the other possible predicate referring to quiddity will be looked at and the one that is even more specific than the last genus will be attached. We will go on combining these concepts until we get to the point where it becomes clear that their combination is equal to the thing to be defined.

If you read these descriptions, you will realize immediately that they do not correspond exactly to either Plato’s or Aristotle’s words. The concepts of proximal

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8 Al-Fārābī, op. cit. 302–304.
9 op. cit., 304–305.

and distal genera occur under Plato, which is to say that the description is based on a hierarchy of genera. There is nothing like this, however, in Plato’s work. Further on one can read about the orderly sequence of differences. As a matter of fact, that also presuppuses a hierarchy of genera as the sequence of differences depends on which they are attached to. So the description cannot have come from Plato, even though it can often be observed in Plato’s dialogues that concepts are clarified through division. This means that although the description is Platonic in its general character, it would be unthinkable without knowledge of the Neo-Platonic Tabula Porphyriana.

Summarily it should be established that in al-Fārābī’s description the “proximal genus” (genus proximum), the “more distal genus”, the “essential accidents” and the rest could only have emerged after Porphyrios, who lived in the third century, had written his Eisagoge containing the theory he worked out. Giving definitions through division (diairesis) is a typical Platonic procedure but the way it was described must have been inspired by a theory of logic of the late Antiquity.

The Middle Platonist Alcinous speaks in his Handbook of Platonism of a scientific procedure “from above’, by means of division and definition” as one can find it in al-Fārābī’s text.10 In chapters 5 and 6 of this Handbook division is described as follows: “Division may consist in dividing a genus into species, or a whole into parts. … It is primarily, however, the division of the genus into species that one must make us for the purpose of discerning what each thing is in itself by virtue of its essence. This, however, could not be achieved without definition. Definition arises from division in the following manner: when one wants to subject a thing to definition, one must first of all grasp the genus, as for instance in the case of man, ‘living thing’; then one must divide this according to its proximate differentiae until one arrives at the species, as for instance into rational and irrational, and mortal and immortal, with the result that if the proximate differentiae are added to the genus which is composed of them, the definition of man results.”11

This is the procedure one can find in al-Fārābī’s description. But there is a further division in al-Fārābī’s text. He speaks of a first and a second division. The first one consists in the division of a genus by means of essential differences into two parts, whereas the second division consists either in the division of the species or the essential differences by means of further essential differences.12

The example one can find in Alcinous’ text: ‘living thing’ can be either rational or irrational, but ‘rational’ beings can be either mortal or immortal. In the first case Alcinous divides the genus by means of two opposing differences into two species, whereas in the second case he divides the first essential difference (rational) by

12 Al-Fārābī: op. cit. 303: ... فَلَوْنِي الْفَصْلَانِ يَسْقُ النَّاسَ فَسَقُ الْبَشَّرِ فَلَوْنِي الْفَصْلَانِ يَسْقُ النَّاسَ فَسَقُ النَّاسَ ...
means of its essential difference into two subclasses. The result is the well known
Platonic definition of man: ἰδιόν ἄνθρωπον ἰδιότητα.

Al-Fārābī’s text reminds the reader of Clement, who proceeds to mention three
types of division: that of a genus into species, that of a whole into parts, and that of
a subject into accidents.\textsuperscript{13} Two of these types are referred to by al-Fārābī.

The Aristotelian definition by synthesis means the examination of individual
entities and their essential attributes. After having collected all common essential
attributes one has to distinguish between those which are genera and those which are
not. Comparing the genera first one has to find the most special one, and then compar-
ning the rest of the attributes one has to choose the attribute which is equal to that
last genus or more general, and then all the essential attributes of the individuals
which are more special, than the genus. Then one has to find an appropriate set of all
these elements which – as a collection – is equal to the thing to be defined.\textsuperscript{14}

In the Posterior Analytics there is a similar description of how a definition can be attained by division. First one has to arrive at the infimae species, then to examine
the peculiar properties in the light of the primary common attributes. As a result of
this procedure the predicates are to be stated in the right order.\textsuperscript{15}

The comparison of these passages proves the interrelation of the two doctrines
in spite of all differences.

But there is no denying of the Platonic ancestry of the first, the Aristotelian
ancestry of the second procedure. This observation must be maintained even if al-
Fārābī’s text talks about “primary” and “secondary” division, and the examples given
sometimes bring Plato and the Middle Platonic school rather then Porphyrius to
mind. This may be illustrated by the fact that the example given in the text for the
primary division is that living beings can be divided into pedate ones and apods. This
message could not have been communicated by Porphyrius, who used essential acci-
dents, i.e., differentiae exclusively. (Apod, pedate, biped, etc. is Plato’s favorite ex-
ample.)

The same result may be arrived at, though with some changes, when the syn-
thetic procedure of definition is being studied. Also the synthetic procedure of definition
relies heavily on the collection of all the concepts that can be regarded as genera
and their being put in a hierarchic order. The hierarchic order of genera, however, re-
calls the lessons of the Tabula Porphyriana, which arose five and a half centuries af-
ter Aristotle’s time.

However, it is not so easy to assess the value of the Arabic text in this context
from the standpoint of the history of Greek logic. When describing the process of def-
inition in Book VI and the subsequent parts of Topica, Aristotle talks about the in-
creasingly proximal or increasingly higher types of genera in the second half of the
chapter 5th of Book VI. In the Greek texts the expressions τὸ ἐγγενέται γένος or …

\textsuperscript{13} Witt, R. E.: Albinus and the History of Middle Platonism, Cambridge, 1937, 37.
\textsuperscript{14} op. cit. 304–305.
\textsuperscript{15} Aristotle: Posterior Analytics, 96 b 15–97 a 6.

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tà ἐπάνω γένη may correspond to the expressions اعـمّ جنس or أخـصر written down in the Arabic texts.16

Even though al-Fārābī’s argumentation does not contradict what Aristotle says in his Topica, being as it is, in complete harmony with all of it the treatment of the question is imbued with Porphyrius’ spirit. It is primarily terminological considerations that lead us to make this statement. It is not so much the Arabic phrase  ألأصّ درس quoted just recently that makes us say this, as it does not render the meaning “the closest” but stands for “more specific” or “most specific”, while recalls the expression species specialissima in the Tabula Porphyriana. Much weightier is the circumstance that the Arabic text contains the expression al-anwā’ al-akhūra (lowest genera), which the Arabic special literature attaches unequivocally to the description in Tabula Porphyriana.

It is true that writing on definition Aristotle did not demonstrate the process of making a definition the way al-Fārābī’s text did, but also in this case the latter seems to be substantially pervaded by the spirit of Aristotle’s Topica.

At the beginning of Book IV Aristotle himself described the way of finding the genus by examining the predicates embracing the individual entities comprehensively in a way similar to al-Fārābī’s. He even made the remarks that all that was important from the point of view of definition.

There is an important difference, however, namely that Aristotle had no intention to set up a hierarchic system of genera as a result of his investigation, as al-Fārābī had. (In spite of the relevance of this important difference it is worth noting that Aristotle’s work did not exclude that possibility either. Although with little emphasis, he still features the idea in his book that one species might fall under several genera, which contain one another.17)

Basically the same idea can be identified in the 143 a 15th to 29th parts of Topica quoted above, where it says that the higher genera can all be stated about the nearest genus and anything falling under it.

Our investigation suggests that in the case of the Aristotelian process of definition the construct is much more complicated than that of the Platonic procedure. Plato had not worked out the theory of definition yet, so there was nothing to confront the procedure associated with his name with. He also tried to define notions, and what we can read in al-Fārābī’s writing resembles this Platonic procedure in many ways.

The trend to attribute teachings to Plato that were absent from his works – with Aristotle’s system of philosophy already available – can be noticed in later ancient works as well. This may be accounted for by the circumstance that the missing points could have been regarded as deficiencies when confronted with Aristotle’s measure of completeness. So, for instance Albinus (now again Alcinous) wrote very much like al-Fārābī in his Eisagoge to Plato’s philosophy (as the passages quoted recently prove it).

He said, if one wants to find out what something actually is (ἐπισκοπεῖ ὁ υἱὸς μὲν ὁ ἔστιν ἐκαστον), several courses my be taken. One of the options is to approach

16 Aristotle: Topica 143 a 15–29.
17 op. cit. 121 b 24–122 a 2.
it from above with division (ἀνωθεν διαμεριστικῶς). Division naturally means the di-
vision of the genus into species, that is division of the whole into parts.18 After demon-
strating this procedure the Platonic author says that the definition is to be made
"along this road" of division (ὅ δὲ ὅρος ἐκ διαμερίσματος γεννᾶται τοῖς τῶν τρόποις).
On the basis of one of the loci and the approach represented by al-Fārābī’s
description, which comes from later Platonic authors, it may be said that although the
statements referring to Plato do not hold true historically, the teachings of the Arabic
text are still rooted in the late traditions of the Antiquities.
Roughly the same conclusion may be arrived at when examining the Aristotel-
ian definition. Aristotle did write on definition and Aristotle’s work was known by
both Greeks and Arabs in later ages. Although this wording of the synthetic pro-
dure of definition figuring in this Arabic passage is sure not to have from Aristotle and
is much more likely to be associated with neo-Platonic traditions, generally speaking
it would be hard to declare that Aristotle could not have written it in this form, unless
some specific details were referred to.
This amounts to saying that the description of the synthetic definition is fairly
elaborate and precise. Besides certain ways of expressing things, it is the entirety of
the system of defining procedures, the presentation of the procedures based on divi-
sion and synthesis as a whole that recall the traditions of the schools of the late ant-
iquities. As an example let me refer again to the locus of Alcinous’ treatise I have
quoted, where the logical procedures are integrated in a system in such a way that the
procedures proceeding downwards from above (which provide definitions through
division and proofs syllogistically) are confronted with procedures progressing up-
wards from below (induction and analysis).

3. RELATIONAL SYLLOGISMS

Scrutinising the two methods associated with Plato and Aristotle it appears that
they represent the knowledge and maintenance of the school traditions of Greek phi-
losophy, even if they cannot be regarded as completely authentic. This circumstance
adds to the value of the report on Xenocrates. Some other circumstances also seem to
justify the sentences about Xenocrates as opposed to the evident contradictions men-
tioned above.
Let me mention one of them first: the Xenocratic syllogism, which can be used
to prove definitions, contains definitions in the place of terms of syllogism. If one
looks whether this was possible in the Greek tradition, the answer is yes. Aristotle
himself said that the definition is an expression that can be used instead of a name,
i. e., term.19 Though not the same use of the definition is described here as was seen
in the Xenocratic syllogism, but in a sense definition and term come to be regarded
as equals.

19 Aristotle: Topica 101 b 38–102 a 2: Ἡσυ δ’ ὅρος μὲν λόγος ὅ τι ἴν ἐξετὴ σημαίνει, ἀποδίδο-
tαι δὲ ἡ λόγος ἄντι ὁνόματος ἡ λόγος ἄντι λόγου.

Another thought-provoking circumstance is that what the Xenocratic syllogism does is precisely the statement of the identity of a name and a definition, and then that of a definition and another definition. This idea bears a resemblance to the concept that Aristotle expounded in Book III of *Topica*. Aristotle thought it was possible to carry through argumentations relying on relationships like ‘more’, ‘less’, or ‘similarly’. The Xenocratic definition, on the other hand, relies on argumentation based on relationships like ‘identically’ and ‘similarly’.

Aristotle did not think it was possible to prove a definition syllogistically, but from the angle of ‘identically’ and ‘similarly’ he approved of something similar to what Xenocrates did as dialectical argumentation.

This is of special interest, as a few centuries later Galen described the relational syllogisms in *Eisagoge dialektike*. He said relational syllogisms were based on relationships like ‘rather’, ‘more’, ‘less’, and ‘similarly’.

However, Galen gave only mathematical examples for the relationship of ‘similarly’, so it is, they are not good enough to take us any nearer the solution of our present problem. Nevertheless it seems important that Galen started the discussion of the question with the remark that Aristotle’s pupils sought to squeeze the relational argumentation into the scheme of the categorical syllogisms.

From his work it appears that these syllogisms were studied by Posidonius too. The last sentence of Chapter XVIII goes like this: “All these syllogisms, indeed, must be said to belong, first to the genus of relational syllogisms, but secondly, in species they are constructed according to the force of an axiom; as Posidonius also says they are called ‘conclusive by force of axiom’.”

In his commentary on this locus J. S. Kieffer points out that this short sentence is difficult to interpret. It is not clear whether Posidonius has limited his investigations to mathematical justifications or to syllogisms of similar nature in general. Kieffer thought some of Galen’s words seemed to indicate that it was he who integrated the relational syllogisms in syllogistics.

From the point of view of our present problem it is worth examining a locus in Alexander of Aphrodisias’ commentary on the *Prior Analytics*. Commenting on a locus of Aristotle’s work starting *47 a 22* he says that if a conclusion necessarily follows from the premises in an inference, it does mean unequivocally that we have to do with a syllogism. The facts that A is equal to B, and G is also equal to B, surely mean that A is equal to G. In spite of this, this inference cannot be called a syllogism. It will only be a syllogism if a premise of general validity comes to be prefixed to before the inference, like for instance the following:

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21 op. cit. 38: μιᾶς ἡμῶν δ᾽ αὐτοῖς οἱ περὶ τῶν Ἀριστοτέλην τοῖς κατηγορικῶς συναφθεῖν.
23 op. cit. 128.
1. Those that are identical with the same thing, are identical with each other.

Rewording the above premise into a single unit it may be said:

2. A and G are equal to B.

From this general premise and the individual one falling under it it follows syllogistically that A and G are equal to each other.\(^{24}\)

Alexander’s and Galen’s loci are interesting because the Xenocratic syllogism cannot clearly be considered to be a regular Aristotelian syllogism. This follows from two things. One of them is that in the place of the terms complex expressions, definitions can be found. This is conspicuous in a syllogism even if the *Topica* locus quoted above may also be interpreted in the way that a name can be substituted by a definition. The other thing is that the Xenocratic syllogism proves a definition. This is impossible if we consider Aristotle’s words quoted above.

However both objections lose validity if the Xenocratic syllogism is not considered to be a regular syllogism of the kind one can find in Galen’s and Alexander’s work. This approach can easily be adopted because Xenocrates’ syllogism has exactly the same setup as the example in Alexander’s text.

On the one hand Xenocrates declares the identity of A (a human being) and B (a thinking, mortal being) and on the other, the identity of B (a thinking, mortal being) and G (a living being walking on two legs). This is what the identity of the human and the living being walking on two legs follows from in the conclusion. So in its structure the defining process coming from Xenocrates is identical with relational syllogisms based on identity. Besides it presents a categorical form, just as Galen said about Aristotle’s followers.

Finally comparing the various loci we may conclude that the research into the relational syllogisms started in the work of the post-Aristotelian generation probably, under the inspiration of the *Topica* locus quoted above, just as the research into the hypothetical syllogisms was started at the same time, probably also spurred by Aristotle’s hints.\(^{25}\)

There must have been similar debates about the logical foundation of the relational syllogisms as about that of the hypothetical syllogisms. Galen’s and Alexander’s words seem to refer to this. Just as there were efforts to legitimize the latter by aligning them formally with the categorical syllogisms, probably the relational syllogisms were treated in the same way with the same purpose.

4. THE VALUE OF AL-FĀRĀĪ’S ACCOUNT

Al-Fārāī’s locus may be considered to be a more or less authentic account of Xenocrates, because ultimately it reflects the conditions of the same post-Aristotelian

\(^{24}\) *Alexandri in Aristotelis Analyticorum Priorum Librum I. Commentarium*, ed. M. WALLIES, Berolini, 1883, 344.


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period as the account of Plato and Aristotle. Later traditions distorted Plato’s ideas substantially – an influence Aristotle suffered much less from. Checking later Greek sources against al-Fārābī, it appears that al-Fārābī rendered Xenocrates’ opinion in Aristotelian interpretation, but perhaps truer to the original than the Greeks, as everything that Alexander and Galen said contained later developments. Resorting to this authentic account, a clear picture can be formed of the history of a subordinate issue of logic, that of the relational syllogisms.

Pázmány Péter Catholic University
H-2087 Piliscsaba
Egyetem u. 1.