

Leibniz's "Schedae de novis formis syllogisticis" (1715): Text and Translation

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The manuscript's signature is: LH, IV, VI, 15, Bl. 7v-8r. At the end of the sheet 7v there is the remark: "Giessae nuper (1715 haec scribo) ... *Triangulum Logicum* edidit [(I am writing this in 1715) . . . in Giessen published *The logical Triangle*]." The name of the publisher of *The Logical Triangle* is missing, probably because Leibniz did simply not remember it. Just one year before, however, in 1714, Johann Christian Lange (1669-1725) published at Giessen a book with the title: *Inventum novum quadrati logici universalis* [*New Discovery of a Universal Logical Square*], a copy of which is possessed by the *Landesbibliothek* Hannover. Very likely Leibniz, besides forgetting the name of the author of the book, confuses the 'logical triangle' with the 'logical square'. At any rate, we have no reason to question the date for these two pages on syllogism: the year 1715.

The manuscript's content was first described by Couturat (C 209), who even edited the first four diagrams on sheet 7v (pp. 209-10). Later on, the first lines of the text on sheet 8r (from the very beginning to "scribemus *H.A est B*") were published by Wolfgang Lenzen (*Calculus Universalis. Studien zur Logik von G. W. Leibniz*, Paderborn, mentis Verlag, 2004, p. 186). The two sheets are each the half of a unique big leaf belonging to a folder which contains some other texts written on sheets of different size and, probably, at different times. On the folder, from Raspe's hand there is the title: "Schedae de novis formis syllogisticis a Leibnitio inventis [Papers concerning some new syllogistic forms invented by Leibniz]". (Rudolph Erich Raspe (1736-1794) was the first editor of the *New Essays* and of some other Leibniz's philosophical papers in 1765.) Then, the following remark: "Quales hic sunt, typis vix possunt committi, nam sine capite et calce apparent. Altera harum schedarum anno 1715 concepta [It is difficult to print these texts, because they seem to have neither a clear beginning nor an evident end. One of these papers has been conceived in the year 1715]". The texts in the folder, however, are more coherent than one may expect from Raspe's sharp remark. In particular, the manuscript that we are publishing seems to be quite coherent and complete in itself, with a clear beginning and a clear end.

On the *verso* of the sheet 7 (7r and 8v are empty) Leibniz uses diagrams to represent the valid moods of the four syllogistic figures, whereas in the second he makes explicit some general rules according to which the diagrams have been drawn. His main concern is about the small vertical stroke that bounds the lines representing

the terms: each line may have only one, both or neither of the ends bounded. The manuscript reveals strong analogies with previous essays on syllogism and syllogistic diagrams. (Cf. in particular: (1) *De formae logicae comprobatione per linearum ductus*, C 292-321; (2) *De formis syllogismorum Mathematicae definiendis*, C 410-16; and (3) *Mathesis Rationis* (first critical edition by W. Lenzen, in *Topoi*, vol. 9, 1, pp. 41-59)). It confirms once more that, as Wolfgang Lenzen writes, "Leibniz dealt with issues in the traditional theory of the syllogism practically throughout his (adult) life, namely from 1665 when he composed the *Dissertatio* until 1715 when we know the *Schedae* were written." ("On Leibniz's Essay *Mathesis Rationis*" in *Topoi*, vol. 9, 1, p. 29.)

Text

LH, IV, VI, 15, Bl. 8r.

Habemus:

O.A est B

Q.A est B

N.A est B

Omne A est B

Quoddam A est B

Nullum A est B

Superest *Quoddam A non est B* quod aliqua nota similis exprimendum esset, ut fieret *A est B*. Posset novum formari pronomen *Haudum*, *Haujusdum*, *Hauidum*, etc. Et *Haudum* erit idem quod *haud omne*.

Itaque pro *Quoddam A non est B*, scribemus *H.A est B*.

Modi non necessarii sunt, qui ex modis ejusdem figurae solo subsumptione fluunt. Et hi sunt duplicis generis; alii enim oriuntur, dum pro conclusione universali substituitur particularis ut in prima *Barbari*, *Celaro*, pro *Barbara*, *Celarent*; in secunda *Cesaro*, *Camestros*, pro *Cesare*, *Camestres*. In quarta *Cadero* pro *Cadere*. Hi non variant schema. Alii oriuntur, dum in praemissa pro particulari substituitur universalis, nam quod ex particulari sequitur, magis etiam sequitur ex universali. Sic in prima *Barbari* ex *Darii*, *Celaro* ex *Ferio*; in secunda *Cesaro* ex *Festino*, *Camestros* ex *Baroco*; in Tertia *Darapti* ex *Disamis* vel ex *Datisi*, *Felapton* ex *Bocardo* vel ex *Ferison*; in quarta *Fegano* ex *Fedibo*, *Balani* ex *Digami*.

Hinc modi necessarii sunt 15 nempe in prima, secunda, tertia, quatuor; in quarta tres. Modi ob conclusionem non necessarii non variant schema; sed modi ob praemissas non necessarii variant. Modi ob conclusionem non necessarii sunt quinque, duo in prima, duo in secunda, unus in quarta. Modi ob praemissas non necessarii sunt quatuor, duo in tertia, et duo in quarta. Ergo sunt schemata 19.

Modi quartae *Cadere*, *Digami*, *Balani* oriuntur ex prima transpositione praemissarum et conversione conclusionis. Caeteri quorum conclusio non est convertibilis oriuntur ex 2da et 3tia per conversionem alterius praemissarum.

Translation

LH, IV, VI, 15, Bl. 8r.

We have:

E.A is B

S.A is B

N.A is B

Every A is B

Some A is B

No A is B

It remains *Some A is not B* which may be expressed by means of some kind of mark like '...' giving rise to '...A is B'. One could form a new pronoun *Haudum*, *Haujusdum*, *Hauidum*, etc. And *Haudum* will be the same as *Not every*.

Thus, instead of *Some A is not B*, we should write *H.A is B*.

Non-necessary moods are those deriving from the moods of the same figure by means of subsumption only. These are of two kinds. Some, indeed, arise from substituting a particular conclusion for a universal one, as *Barbari* and *Celaro* for *Barbara* and *Celarent*, in the first figure; *Cesaro* and *Camestros* for *Cesare* and *Camestres*, in the second figure; *Cadero* for *Cadere*, in the fourth one. All these syllogisms do not change schema. Some arise from substituting a universal premise for a particular one: indeed, what follows from a particular sentence, it follows all the more so from a universal one. Thus, in the first figure *Barbari* originates from *Darii*, *Celaro* from *Ferio*; in the second figure *Cesaro* originates from *Festino*, *Camestros* from *Baroco*; in the third figure *Darapti* originates either from *Disamis* or from *Datisi*, *Felapton* either from *Bocardo* or from *Ferison*; in the fourth figure, *Fegano* originates from *Fedibo*, *Balani* from *Digami*.

Therefore the necessary moods are 15, i.e. four in the first, second and third figure; three in the fourth one. Those moods which because of the conclusion are not necessary do not change their schema; but those which are not necessary because of the premises, change. Moods which are not necessary because of the conclusion are five: two in the first figure, two in the second and one in the fourth. Moods which are not necessary because of the premises are four: two in the third and two in fourth figure. Therefore, we have 19 schemata.

The moods *Cadere*, *Digami*, *Balani* of the fourth figure originate from the first one, transposing the premises and converting the conclusion. All the remaining moods whose conclusion cannot be converted originate from the second and third figure by converting one of the premises.

Cum occurrunt in praemissis universales negativae, utrumque terminum simpliciter limitare oportet; cum occurrit in praemissis universalis affirmativa, saltem subjectum praedicabile limitare oportet; major vel minor terminus particularis non opus habet limitatione.

Major vel minor terminus qui est praedicatum propositionis affirmativae non habet opus limitatione.

Termini qui non est limitatus partem locare potes etiam alibi, etsi parti jam positae non connectatur, seu etsi linea sit interrupta, inservit ad refutandum. Itaque omittendae limitationes non necessariae.

Omnis terminus propositionis universalis negativae est limitatus, praedicatum propositionis particularis negativae est limitatum, subjectum praedicationis universalis affirmativae est limitatum. Omne subjectum propositionis particularis est illimitatum. Omne praedicatum propositionis affirmativae est illimitatum. Omne praedicatum propositionis negativae est limitatum.

Solae hic spectantur praemissae, quae constant ex medio termino et extremis. Extremi Termini non nisi unam praemissam ingrediuntur. Itaque in illis non est difficultas.

In modis necessariis nunquam evenit ut medius simul sit terminus propositionis universalis negativae, et subjectum propositionis Universalis affirmativae; neque ut sit simul subjectum propositionis universalis affirmativae, et praedicatum propositionis negativae, seu generaliter in modis necessariis nunquam evenit ut medius ob binas praemissas debeat limitari. Invenio etiam medium semper limitari. Itaque vel est terminus propositionis negativae, vel subjectum universalis affirmativae.

Sed in modis non necessariis tertiae et quartae contingere potest ut sit bis ex diversa praemissa limitandus; et quidem in *Darapti* bis limitatur quia bis est subjectum propositionis universalis affirmativae. In *Felapton* tertiae et *Fegano* quartae bis limitatur, quia simul est terminus propositionis universalis negativae, et subjectum universalis affirmativae.

Potest Syllogismus esse compositus plurium Mediorum si supprimatur conclusio prosyllogismi tanquam in praemissis virtualiter contenta. Itaque procedit hic syllogismus compositus: Omne B est C. Omne A est B. Omne D est A. Ergo omne D est C. Hic omnes termini sunt limitati praeter C.

If universal negative sentences occur in the premises, then both terms need to be bounded; if in the premises a universal affirmative sentence occurs, then at least the predicable subject has to be bounded; the major or minor term of a particular sentence does not need to be bounded.

The major or the minor term which is the predicate of an affirmative sentence, does not need to be bounded.

One may place even elsewhere the part of a term which is not bounded, even though it cannot be linked with the preexisting part, i.e. if the line is broken: in this case it may be useful for building a refutation. Therefore we have to omit all the bounds which are not necessary.

Every term of a universal negative proposition is bounded; the predicate of a particular negative proposition is bounded; the subject of a universal affirmative predication is bounded. Every subject of a particular proposition is unbounded. Every predicate of an affirmative proposition is unbounded. Every predicate of a negative proposition is bounded.

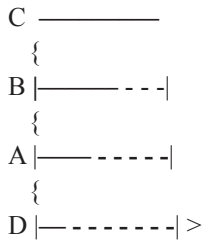
We consider here only premises which are made up of a middle term and of extreme terms. Extreme terms enter a premise only; therefore they do not cause any difficulty.

It never happens that in a necessary mode the middle term is at the same time the term of a universal negative and the subject of a universal affirmative proposition; nor that it is at the same time the subject of a universal affirmative proposition and the predicate of a negative proposition, i.e. in general in a necessary mode it never happens that the middle term has to be bounded because of the two premises. Moreover, I find that the middle term is always bounded. Thus, either it is a term of a negative proposition or is the subject of a universal affirmative proposition.

In the non-necessary modes of the third and fourth figures it may happen that the middle term has to be bounded twice in different premises; and in *Darapti* too it is bounded twice because it is twice the subject of an affirmative universal proposition. In *Felapton* of the third figure and in *Fegano* of the fourth it is bounded twice, because it is at the same time the term of a universal negative proposition and the subject of a universal affirmative.

A syllogism may be composed of several middle terms, if we eliminate the conclusion of the prosyllogism which is in some way contained in the premises. Thus, the following compound syllogism proceeds: Every B is C. Every A is B. Every D is A. Therefore every D is C. Here all terms are closed, with the only exception of C.

<Omne B est C
Omne A est B
[Omne A est C]
Omne D est A
Omne D est C.

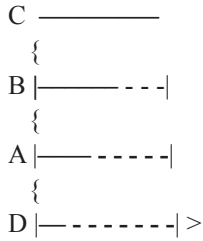


In tali schemate patet non esse necesse suppleri conclusionem.

Utile erit combinationes syllogismorum adhiberi ex exemplis autorum.

[...]

<Every B is C
Every A is B
[Every A is C]
Every D is A
Every D is C.



It is evident that in this schema we do not need to add the conclusion.

It will be useful to employ combinations of syllogisms derived from examples of several authors.

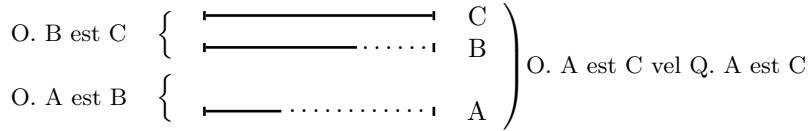
[...]*

**[Ed: The manuscript ends with some calculations concerning the number of moods.]*

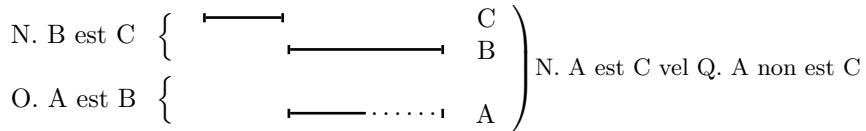
LH, IV, VI, 15, Bl. 7v

FIG. I

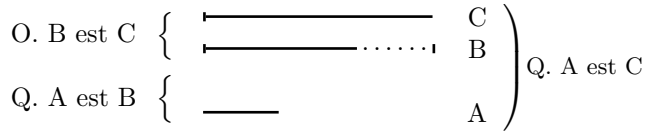
Barbara vel *Barbari*



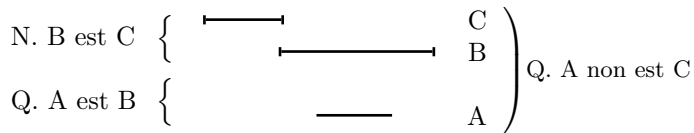
Celarent vel *Celaro*



Darii vel *Barbari*



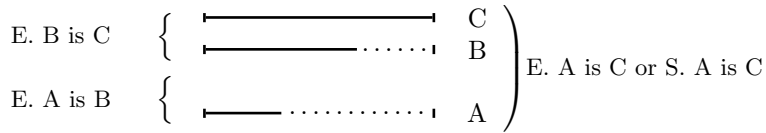
Ferio vel *Celaro*



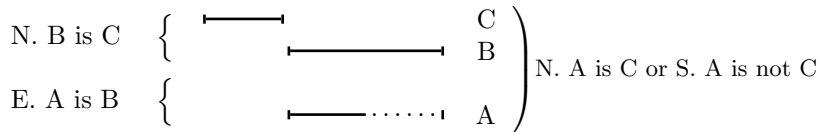
LH, IV, VI, 15, Bl. 7v

FIG. I

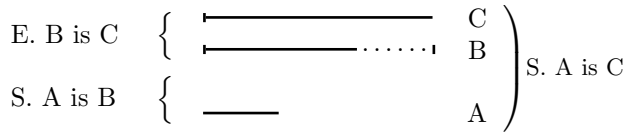
Barbara or *Barbari*



Celarent or *Celaro*



Darii or *Barbari*



Ferio or *Celaro*

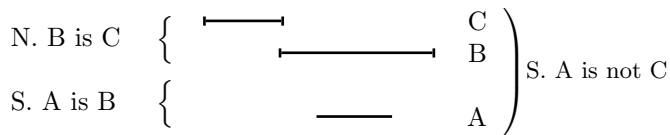
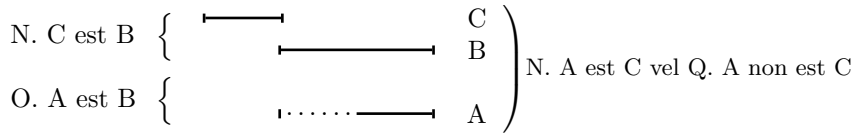
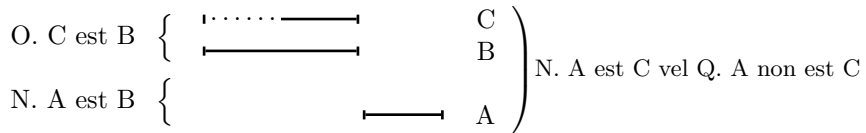


FIG. II

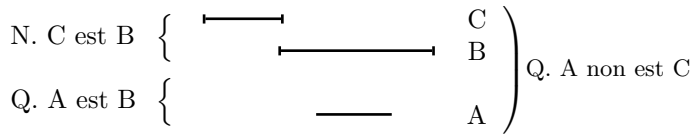
Cesare vel *Cesaro*



Camestres vel *Camestros*



Festino



Ex *Festino* sequitur *Cesaro*, ex *Baroco* sequitur *Camestros*, sed mutandum est nonnihil schema et limitandus terminus A.

Baroco

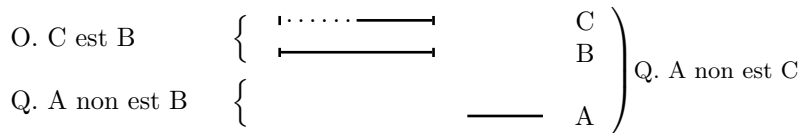
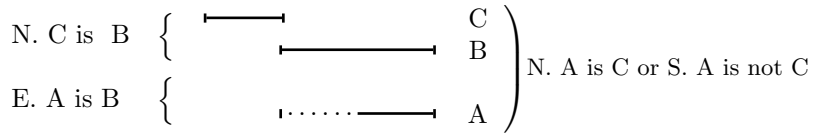
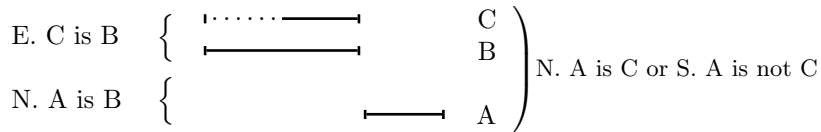


FIG. II

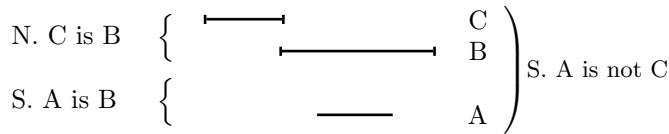
Cesare or *Cesaro*



Camestres or *Camestros*



Festino



From *Festino* follows *Cesaro*, from *Baroco* follows *Camestros*, but one has to introduce few changes and the term A must be bounded.

Baroco

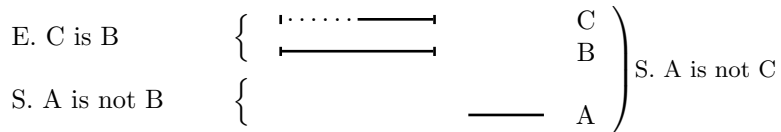
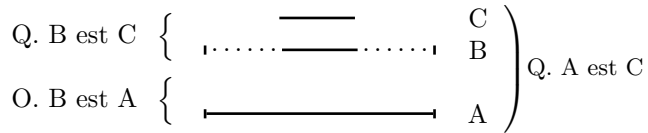


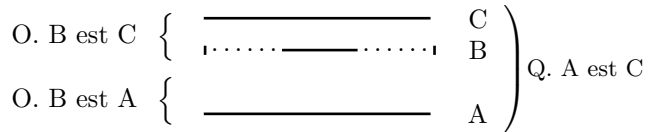
FIG. III

Disamis

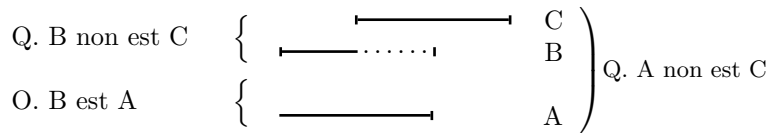


Ex *Disamis* fit *Darapti* si illimitatus C producatur minimum quantum B.

Darapti



Bocardo



Ex *Bocardo* fit *Felapton* si exclusio fiat universalis retracto limite ipsius C.

Felapton

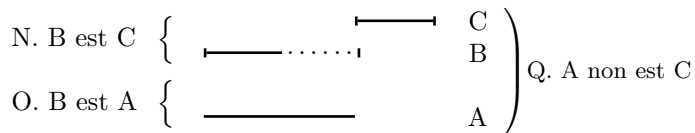
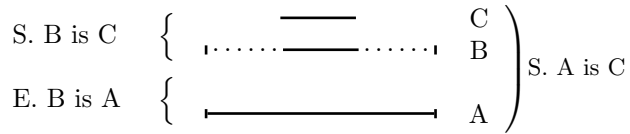


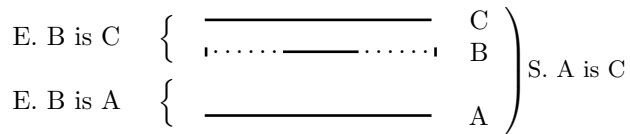
FIG. III

Disamis

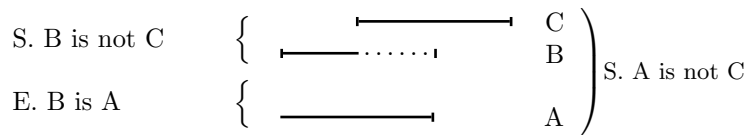


From *Disamis* we have *Darapti* once the unbounded C has been extended of the smallest quantity necessary to equal B.

Darapti

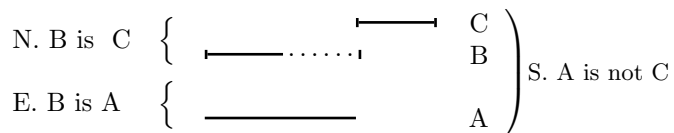


Bocardo

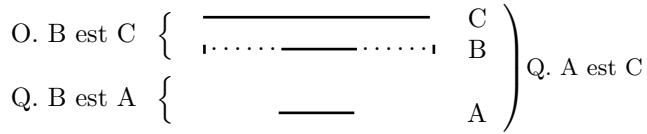


From *Bocardo* we have *Felapton* if we draw back the small vertical line bounding C, thus producing a universal exclusion.

Felapton

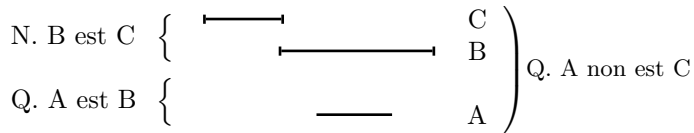


Datisi



Ex *Datisi* fit *Darapti* si A illimitatus producatur minimum quantum B

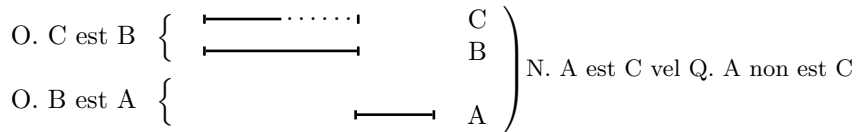
Ferison vel *Felapton*



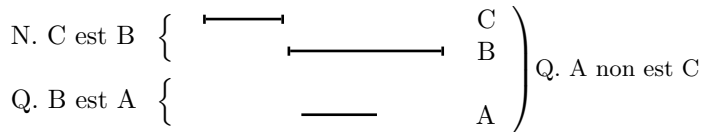
Eodem modo ex *Ferison* fit *Felapton*

FIG. IV

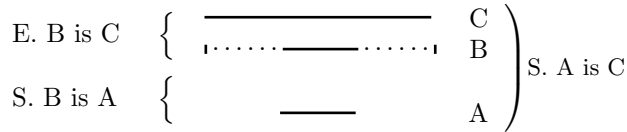
Cadere vel *Cadero*



Fedibo

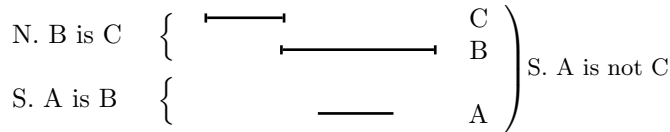


Datisi



From *Datisi* we have *Darapti* once the unbounded A has been extended of the smallest quantity necessary to equal B.

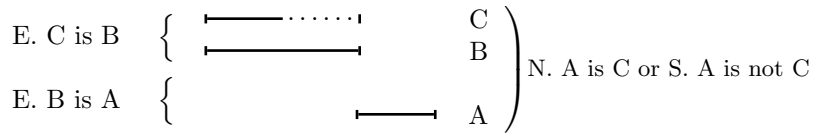
Ferison or *Felapton*



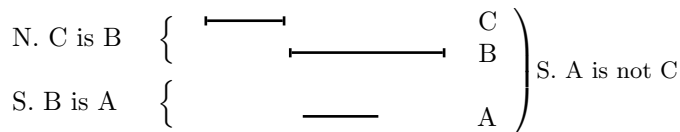
In the same way, from *Ferison* we have *Felapton*.

FIG. IV

Cadere or *Cadere*

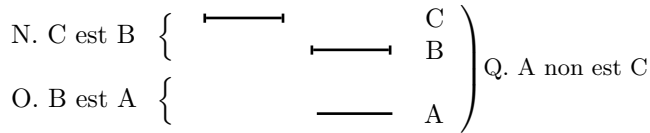


Fedibo

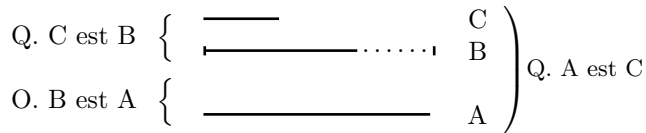


Ex *Fedibo* fit *Fegano* eodem modo

Fegano

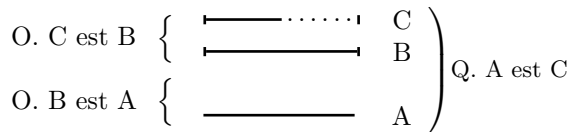


Digami



Ex *Digami* fit *Balani*, si C limitetur ut non possit egredi B

Balani



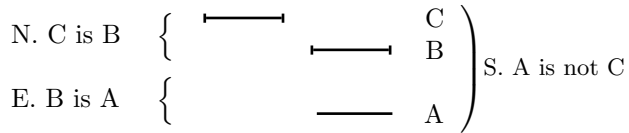
Barbara, *Celarent* **primae**, *Darii* *Ferioque*
Cesare, *Camestres*, *Festino*, *Baroco*, **secundae**
Tertia grande sonans edit *Darapti*, *Felapton*
 Adjungens *Disamis*, *Datisi*, *Bocardo*, *Ferison*
Cadere, *Fedibo*, *Fegano*, *Digami*, *Balani*, **quartae**.

Hoc ordine disponenda essent Schemata, quo in versibus locantur modi.
 Prodibunt Schemata 19, quot modi.

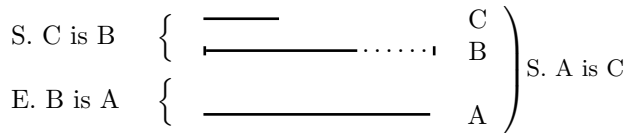
Giessae nuper ... (1715 hoc scribo) *Triangulum Logicum* edidit

In the same way from *Fedibo* we have *Fegano*.

Fegano

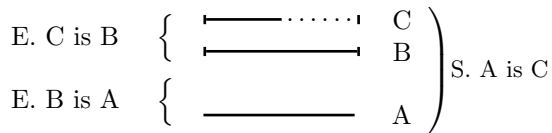


Digami



From *Digami* we have *Balani*, if C is bounded in such a way that it cannot exceed B:

Balani



Barbara, Celarent prima, Darii Ferioque
Cesare, Camestres, Festino, Baroco, secunda
Tertia grande sonans edit *Darapti, Felapton*
Adjungens Disamis, Datisi, Bocardo, Ferison
Cadere, Fedibo, Fegano, Digami, Balani, quarta.

Diagrams must be arranged in the same order as moods are arranged in these verses.

We will have 19 diagrams and the same number of moods.

Recently (I am writing this in 1715) ... in Giessen published *The logical triangle*.