Book 6: Chapter 3

Syllogisms

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Section 1. Representation of Syllogisms.

We already know how to represent each of the three Pro- positions of a Syllogisms in subscript form. When that is done, all we need, besides, is to write the three expressions in a row, with ”Ü” between the Premisses, and ”∂” before the Conclusion.

[Thus the Syllogism

“No x are m’;
All m are y.
.*. No x are y’.”

may be represented thus:–>

xm’0 Ü m1y’0 ∂ xy’0

When a Proposition has to be translated from concrete form into subscript form, the Reader will find it convenient, just at first, to translate it into abstract form, and thence into subscript form. But, after a little practice, he will find it quite easy to go straight from concrete form to subscript form.]

Section 2. Formulae for solving Problems in Syllogisms.

When once we have found, by Diagrams, the Conclusion to a given Pair of Premisses, and have represented the Syllogism in subscript form, we have a Formula, by which we can at once find, without having to use Diagrams again, the Conclusion to any other Pair of Premisses having the same subscript forms.

[Thus, the expression

xm0 Ü ym’0 ∂ xy0

is a Formula, by which we can find the Conclusion to any Pair of Premisses whose subscript forms are

xm0 Ü ym’0

For example, suppose we had the Pair of Propositions

“No gluttons are healthy;_No unhealthy men are strong”.

proposed as Premisses. Taking “men” as our ‘Universe, and making m = healthy; x = gluttons; y = strong; we might translate the Pair into abstract form, thus:–>

“No x are m;
No m’ are y.”
These, in subscript form would be

xm0 Ü m’y0

which are identical with those in our Formula. Hence we at once know the Conclusion to be

xy0

that is, in abstract form,

“No x are y”;

that is, in concrete form,

“No gluttons are strong”]

I shall now take three different forms of Pairs of Pre- misses, and work out their Conclusions, once for all, by Diagrams; and thus obtain some useful Formulae. I shall call them “Fig. I”, “Fig. II”, and “Fig. III”.

Fig. I.

This includes any Pair of Premisses which are both of them Nullities, and which contain Unlike Eliminands.

The simplest case is

```
              xm0 Ü ym'0
 ---------------    -------
|(0)    |       |  |(0)|   |
|    ---|---    |  |---|---|
|   |(0)|(0)|   |  |   |   |
|---|---|---|---|   -------
|   |   |   |   |
|    ---|---    |  .*. xy0
|(0)    |       |
 ---------------
```

In this case we see that the Conclusion is a Nullity, and that the Retinends have kept their Signs.

And we should find this Rule to hold good with any Pair of Premisses which fulfil the given conditionds.

[The Reader had better satisfy himself of this, by working out, on Diagrams, several varieties, such as

m1x0 Ü ym’0 (which ∂ xy0)
xm’0 Ü m1y0 (which ∂ xy0)
x’m0 Ü ym’0 (which ∂ x’y0)
m’1x’0 Ü m1y’0 (which ∂ x’y’0).]

If either Retinend is asserted in the Premisses to exist, of course it may be so asserted in the Conclusion.

Hence we get two Variants of Fig. I, viz.

(a) where one Retinend is so asserted;_(B) where both are so asserted.

[The Reader had better work out, on Diagrams, examples of these two Variants, such as

m1x0 Ü y1m’0 (which proves y1x0)
x1m’0 Ü m1y0 (which proves x1y0)
x’1m0 Ü y1m’0 (which proves x’1y0 Ü y1x’0).]

The Formula, to be remembered, is

xm0 Ü ym'0 ∂ xy0

with the following two Rules:–>

(1) Two Nullities, with Unlike Eliminends, yield a Nullity, in which both Retinends keep their Signs.

(2) A Retinend, asserted in the Premisses to exist, may be so asserted in the Conclusion.

{Note that Rule (1) is merely the Formula expressed in words.]

Fig. II.

This includes any Pair of Premisses, of which one is a Nullity and the other an Entity, and which contain Like Eliminands.

The simplest case is

```
              xm0 Ü ym1
 ---------------    -------
|        |       |  |   |   |
|     ---|---    |  |---|---|
|    |(0)|(0)|   |  |(1)|   |
|---|---|---|---|    -------
|    |(1)|   |   |
|     ---|---    |  .*. x'y1
|        |       |
 ---------------
```

In this case we see that the Conclusion is an Entity, and that the Nuliity-Retinend has changed its Sign.

And we should find this Rule to hold good with any Pair of Premisses which fulfil the given conditions.

[The Reader had better satisfy himself of this, by working out, on Diagrams, several varieties, such as

x'm0 Ü ym1 (which ∂ xy1)

x1m'0 Ü y'm'1 (which ∂ x'y'1)
m1x0 Ü y'm1 (which ∂ x'y'1).]

The Formula, to be remembered, is,

xm0 Ü ym1 ∂ x'y1

with the following Rule:–>

A Nullity and an Entity, with Like Eliminands, yield a Entity, in which the Nullity-Retinend changes its Sign.

[Note that this Rule is merely the Formula expressed in words.]

Fig. III.

This includes any Pair of Premisses which are both of them Nullities, and which contain Like Eliminands asserted to exist.

The simplest case is

xm0 Ü ym0 Ü m1

[Note that "m1" is here stated separately, because it does not matter in which of the two Premisses it occurs: so that this includes the three forms "m1x0 Ü ym0", "xm0 Ü m1y0", and "m1_0 Ü m1y0".]

```
 ---------------     -------
|       |       |   |   |   |
|    ---|---    |   |---|---|
|   |(0)|(0)|   |   |   |(1)|
|---|---|---|---|    -------
|   |(0)|(1)|   |
|    ---|---    |   .*. x'y'1
|       |       |
 ---------------
```

In this case we see that the Conclusion is an Entity, and that both Retinends have changed their Signs.

And we should find this Rule to hold good with any Pair of Premisses which fulfil the given conditions.

[The Reader had better satisfy himself of this, by working out, on Diagrams, several varieties, such as

x'm0 Ü m1y0 (which ∂ xy'1)
m'1x0 Ü m'y'0 (which ∂ x'y1)
m1x'0 Ü m1y'0 (which ∂ xy1).]

The Formula, to be remembered, is

xm0 Ü ym0 Ü m1 ∂ x'y'1

with the following Rule (which is merely the Formula ex- pressed in words):–>

Two Nullities, with Like Eliminands asserted to exist, yield an Entity, in which both Retinends change their Signs.

In order to help the Reader to remember the peculiarities and Formulae of these three Figures, I will put them all to- gether in one Table.

TABLE IX.

Fig. I. xm0 Ü ym'0 ∂ xy0 Two Nullities, with Unlike Eliminands, yield a Nullity, in which both Retinends keep their Signs. A Retinend, asserted in the Premisses to exist, may be so asserted in the Conclusion.
Fig. II. xm0 Ü ym1 ∂ x'y1 A Nullity and an Entity, with Like Eliminands, yield an Entity, in which the Nullity-Retinend changes its Sign.
Fig. III. xm0 Ü ym0 Ü m1 ∂ x'y'1

```
|    Two Nullities, with Like Eliminands asserted to exist,   |
|  yield an Entity, in which both Retinends change their      |
|  Signs.                                                     |
|_____________________________________________________________|
```

I will now work out, by these Formulae, as models for the Reader to imitate, some Problems in Syllogisms which have been already worked, by Diagrams, in Book V., Chap. II.

(1)[see p. 64] “No son of mine is dishonest; People always treat an honest man with respect.”

Univ. “men”; m = honest; x = my sons; y = treated with respect.

xm’0 Ü m1y’0 ∂ xy’0 [Fig. I.

i.e. “No son of mine ever fails to be treated with respect.”

(2)[see p. 64] “All cats understand French;
Some chickens are cats.”

Univ. “creatures”; m = cats; x = understanding French y = chickens

m1x’0 Ü ym1 ∂ xy1 [Fig II.

“Some chickens understand French.”

(3)[see p. 64] “All diligent students are successful;
All ignorant students are unsuccessful.”

Univ. “students”; m = successful; x = diligent; y = ignorant.

x1m’0 Ü y1m0 ∂ x1y0 Ü y1_0 [Fig. I(B).

“All diligent students are learned; and all ignorant students are idle.”

(4)[see p. 66] “All soldiers are strong;
All soldiers are brave.
Some strong men are brave.”

Univ. “men”; m = soldiers; x = strong; y = brave.

m1x’0 Ü m1y’0 ∂ xy1 [Fig. III.

Hence proposed Conclusion is right.

(5)[see p. 67] “I admire these pictures;
When I admire anything, I wish to examine it thoroughly.
I wish to examine some of these pictures thoroughly.”

Univ. “things”; m = admired by me; x = these; y = things which I wish to examine thoroughly.

x1m’0 Ü m1y’0 ∂ x1y’0 [Fig I(a).

Hence proposed Conclusion, xy1, is incomplete, the complete one being “I wish to examine all these pictures thoroughly.”

(6)[see p. 67] “None but the brave deserve the fair;
Some braggarts are cowards.
Some braggarts do not deserve the fair.”

Univ. “persons”; m = brave; x = deserving of the fair; y = braggarts.

m’x0 Ü ym’1 ∂ x’y1 [Fig. II.

Hence proposed Conclusion is right.

(7)[see p. 69] “No one, who means to go by the train and cannot get a conveyance, and has not enough time to walk to the station, can do without running;_This party of tourist mean to go by the train and cannot get a conveyance, but they have plenty of time to walk to the station.
This party of tourists need not run.”

Univ. “persons meaning to go by the train, and unable to get a conveyance”;

m = having enough time to walk to th station;
x = needing to run; y = these tourists.

m’x’0 Ü y1m’0 do not come under any of the three Figures.

Hence it is necessary to return to the Method of Diagrams, as shown at p. 69.

Hence there is no Conclusion.

Section 3.

Fallacies.

Any argument which deceives us, by seeming to prove what it does not really prove, may be called a 'Fallacy' (derived from the Latin verb fallo "I deceive"): but the particular kind, to be now discussed, consists of a Pair of Propositions, which are proposed as the Premisses of a Syllogism, but yield no Conclusion.

When each of the proposed Premisses is a Proposition in I, or E, or A, (the only kinds with which we are now con- cerned,) the Fallacy may be detected by the 'Method of Diagrams,' by simply setting them out on a Triliteral Diagram, and observing that they yield no information which can be transferred to the Biliteral Diagram.

But suppose we were working by the 'Method of Subscripts,' and had to deal with a Pair of proposed Premisses, which happened to be a 'Fallacy,' how could we be certain that they would not yield any Conclusion?

Our best plan is, I think, to deal with Fallacies in the same was as we have already dealt with Syllogisms: that is, to take certain forms of Pairs of Propositions, and to work

them out, once for all, on the Triliteral Diagram, and ascer- tain that they yield no Conclusion; and then to record them, for future use, as Formulae for Fallacies, just as we have already recorded our three Formulae for Syllogisms.

Now, if we were to record the two Sets of Formulae in the same shape, viz. by the Method of Subscripts, there would be considerable risk of confusing the two kinds. Hence, in order to keep them distinct, I propose to record the Formulae for Fallacies in words, and to call them "Forms" instead of "Formulae."

Let us now proced to find, by the Method of Diagrams, three “Forms of Fallacies,” which we will then put on record for future use. They are as follows:–>

(1) Fallacy of Like Eliminands not asserted to exist.

(2) Fallacy of Unlike Eliminands with an Entity-Premiss.

(3) Fallacy of two Entity-Premisses.

These shall be discussed separately, and it will be seen that each fails to yield a Conclusion

(1) Fallacy of Like Eliminands not asserted to exist.

It is evident that neither of the given Propositions can be an Entity, since that kind asserts the existence of both of its Terms (see p. 20). Hence they must both be Nullities.

Hence the given Pair may be represented by (xm0 Ü ym0), with or without x1, y1.

These, set out on Triliteral Diagrams, are

```
    xm0 Ü ym0         x1m0 Ü ym0         xm0 Ü y1m0         x1m0 Ü y1m0
 ---------------    ---------------    ---------------    ---------------
|       |       |  |      (1)      |  |       |       |  |      (1)      |
|    ---|---    |  |    ---|---    |  |    ---|---    |  |    ---|---    |
|   |(0)|(0)|   |  |   |(0)|(0)|   |  |   |(0)|(0)|   |  |   |(0)|(0)|   |
|---|---|---|---|  |---|---|---|---|  |(1)|---|---|---|  |(1)|---|---|---|
|   |(0)|   |   |  |   |(0)|   |   |  |   |(0)|   |   |  |   |(0)|   |   |
|    ---|---    |  |    ---|---    |  |    ---|---    |  |    ---|---    |
|       |       |  |       |       |  |       |       |  |       |       |
 ---------------    ---------------    ---------------    ---------------
```

(2) Fallacy of Unlike Eliminands with an Entity-Premiss.

Here the given Pair may be represented by (xm0 Ü ym’1) with or without x1 or m1.

These, set out on Triliteral Diagrams, are

```
     xm0 Ü ym'1        x1m0 Ü ym'1        m1x0 Ü ym'1

   ---------------    ---------------    ---------------
  |       |       |  |      (1)      |  |       |       |
  |    ---|---    |  |    ---|---    |  |    ---|---    |
  |   |(0)|(0)|   |  |   |(0)|(0)|   |  |   |(0)|(0)|   |
  |(1)|---|---|---|  |(1)|---|---|---|  |(1)|---|---|---|
  |   |   |   |   |  |   |   |   |   |  |   |  (1)  |   |
  |    ---|---    |  |    ---|---    |  |    ---|---    |
  |       |       |  |       |       |  |       |       |
   ---------------    ---------------    ---------------
```

(3) Fallacy of two Entity-Premisses.

Here the given Pair may be represented by either (xm1 Ü ym1) or (xm1 Ü ym’1).

These, set out on Triliteral Diagrams, are

```
     xm1 Ü ym1         xm1 Ü ym'1

   ---------------    ---------------
  |       |       |  |       |       |
  |    ---|---    |  |    ---|---    |
  |   |  (1)  |   |  |   |  (1)  |   |
  |---|(1)|---|---|  |(1)|---|---|---|
  |   |   |   |   |  |   |   |   |   |
  |    ---|---    |  |    ---|---    |
  |       |       |  |       |       |
   ---------------    ---------------
```

Section 4. Method of proceeding with a given Pair of Propositions.

Let us suppose that we have before us a Pair of Propositions of Relation, which contain between them a Pair of codivisional Classes, and that we wish to ascertain what Conclusion, if any, is consequent from them. We translate them, if necessary, into subscript-form, and then proceed as follows:–

(1) We examine their Subscripts, in order to see whether they are
(a) a Pair of Nullities;
or (b) a Nullity and an Entity;
or (c) a Pair of Entities.

(2) If they are a Pair of Nullities, we examine their Eliminands, in order to see whether they are Unlike or Like.

If their Eliminands are Unlike, it is a case of Fig. I. We then examine their Retinends, to see whether one or both of them are asserted to exist. If one Retinend is so asserted, it is a case of Fig. I(a); if both, its a case of Fig. I(B).

If their Eliminands are Like, we examine them, in order to see whether either of them is asserted to exist. If so, it is a case of Fig. III.; if not, it is a case of “Fallacy of Like Eliminands not asserted to exist.”

(3) If they are a Nullity and an Entity, we examine their Eliminands, in order to see whether they are Like or Unlike.

If their Eliminands are Like, it is a case of Fig. II.; if Unlike, it is a case of “Fallacy of Unlike Eliminands with an Entity-Premiss.”

(4) If they are a Pair of Entities, it is a case of “Fallacy of two Entity-Premisses.”