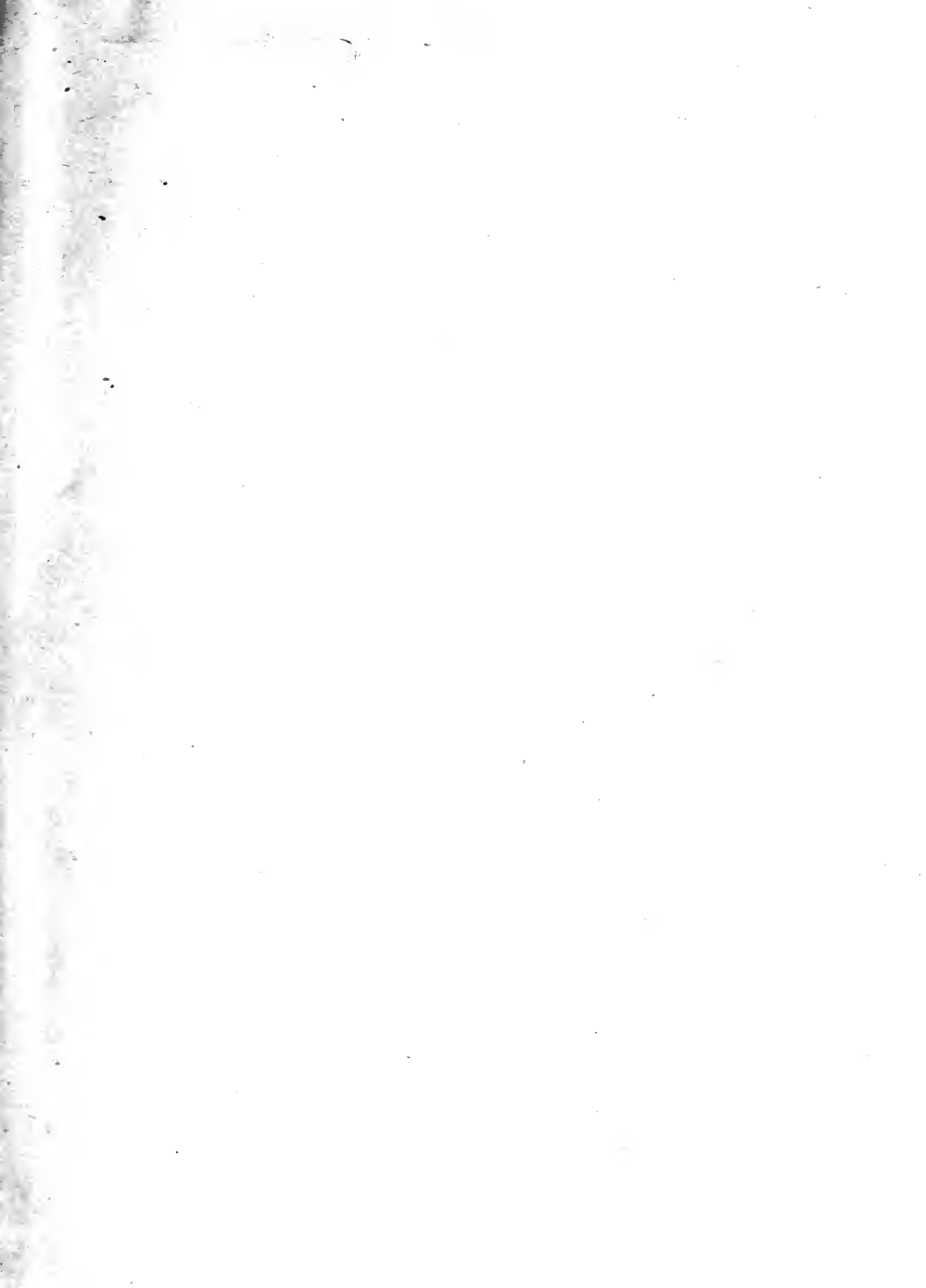


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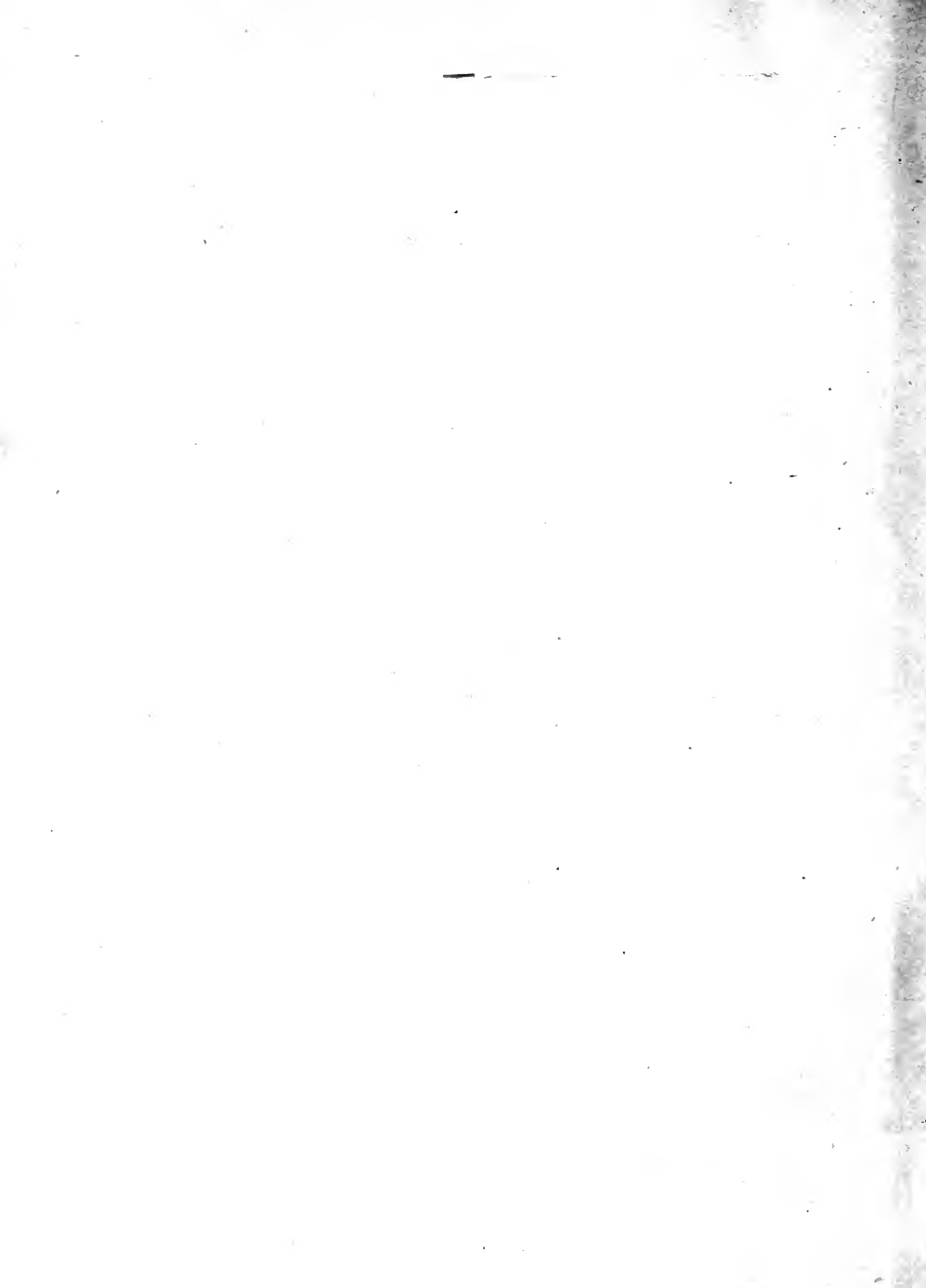
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A

FIRST LOGIC BOOK.

BY

D. P. CHASE, M.A.

FELLOW OF ORIEL COLLEGE, PRINCIPAL OF ST. MARY HALL.

“*Mehercle*, if their sons be ingenious they shall want no instruction ;
if their daughters be capable, I will put it to them.”—*Love's Labor's Lost*,
Act iv. Sc. ii.

OXFORD :

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PREFACE.

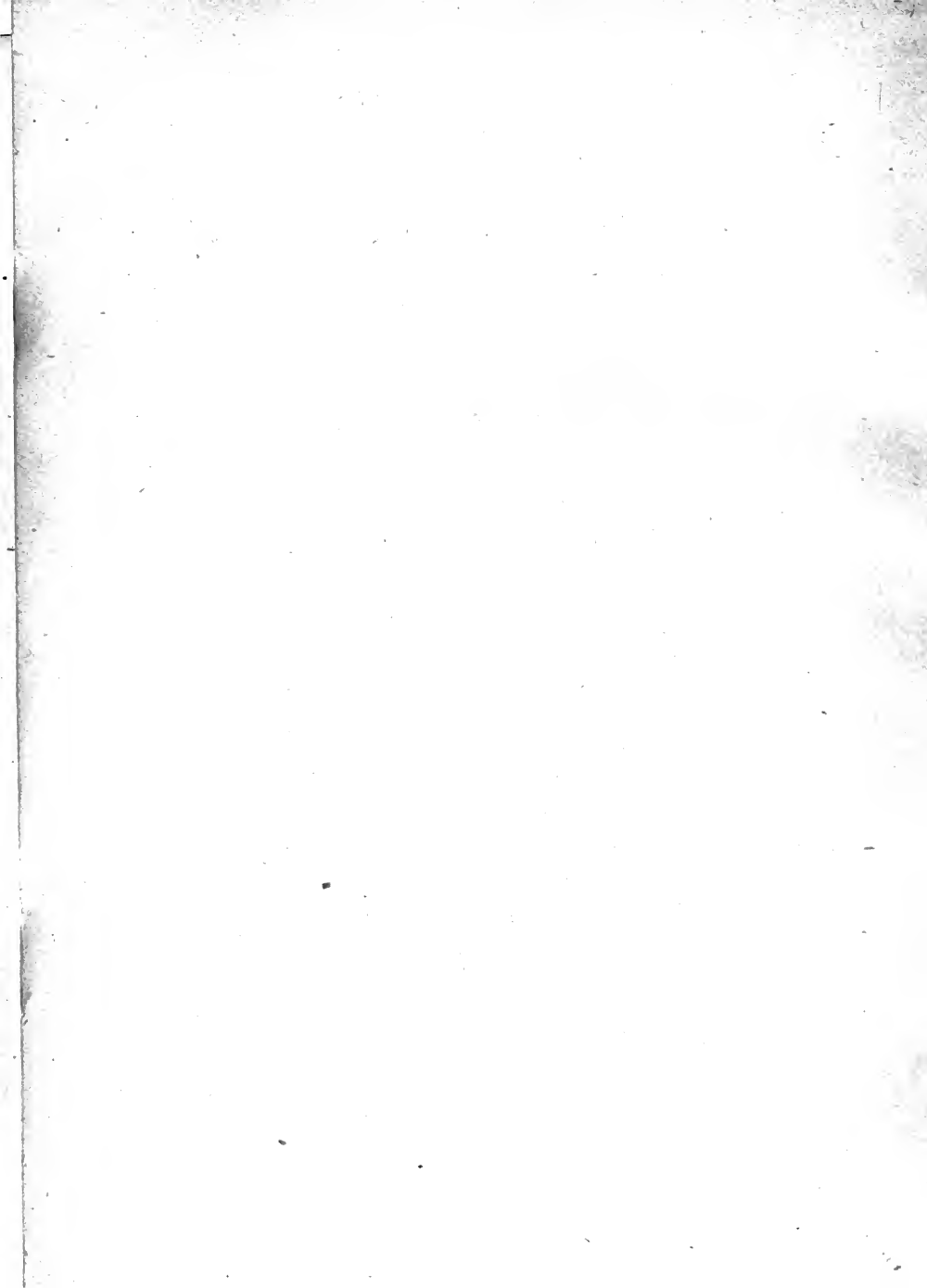
THE attempt is made, in the following pages, to render the bare rudiments of Deductive Logic intelligible to every person, of average intelligence, of either sex; in the hope that those rudiments may be adopted, for both sexes, as a regular part of mental training.

(1) Arithmetic,

(2) The First Book of Euclid,

(3) The Rudiments of Deductive Logic,

supposing that each is *intelligently taught and mastered*, form an excellent course of mental training: one, moreover, which may easily be given at Schools.



PART I.

CHAPTER I.

OF THE ART OF LOGIC, so far as it will be treated of in the following pages, the purpose is TO LAY DOWN RULES WHEREBY TO DETERMINE—

1. *Any Proposition being assumed^a to be true, what other Propositions must be maintained with it.*

2. *Any two or more Propositions being assumed^a to be true, whether any, and, if any, what, other Propositions result from them.*

The former is the more generally applied. Rarely, if ever, in practice do we start from assumed Propositions in order to arrive at the resulting Proposition.

We take up Propositions from many different causes: when any one of these is challenged, we seek to discover those other Propositions by which it must be maintained.

For instance—our forefathers maintained (that) “Dueling is to be permitted.”

Asked “Why?” they would have replied, (because) “It is socially expedient.” Further pressed by “How so?” they would have said,

^a Logic is concerned only with relative, not with absolute, truth, although incidentally it assists in arriving at the latter.

“It keeps up a sense of honour.”

“It prevents bullying.”

“It does much to equalise the weak and the strong.”

Pressed again by “Well—what then?” they would have advanced the general assertions—

“Whatever keeps up a sense of honour,	} is socially expedient.”
..... prevents bullying,	
..... does much to equalise the weak and the strong,	

What then is a LOGICAL PROPOSITION ?

A sentence which asserts that a certain attribute (or aggregate of attributes) does, or does not, exist in a certain Subject.

Its parts are, necessarily, four :

Subject—whereof something is asserted.

Predicate—asserted of the Subject.

Copula—shewing whether such assertion is affirmative or negative.

Sign of quantity—shewing of how much of the Subject the Predicate is asserted.

The Copula ordinarily employed is the present Indicative of the Verb “to be”; and, for reasons to be hereafter noticed, no other tense.

But, inasmuch as the office of the Copula is simply to indicate relation between Subject and Predicate as ideas, and the verb “to be” implies, unavoidably, their existence as things,

We propose to employ Algebraic signs, i. e., for affirmative assertions + , for negative assertions — .

Examples of Logical Proposition in strict Form.

SIGN OF QUANTITY.	SUBJECT.	COPULA.	PREDICATE.
(a) Some	men	+	dishonest.
(b) Some	war	—	righteous.
(c) All	deceit	+	hateful.
(d) All	birds	—	quadrupeds.

The word PREDICATE is unavoidably ambiguous.

It means—

1. *The thing or attribute predicated*; as, above, Dishonesty, Righteousness, &c.
2. *The Term predicated*; Dishonest, Righteous, &c.

Since “dishonest” means “having dishonesty,”
 “righteous” . . . “having righteousness,”

the assertion is the same when we say,

for (a) Dishonesty exists in some men,

for (b) Righteousness does not exist in some wars.

But our own language (as do many others) expressly avoids this form and employs the other.

By PREDICATE therefore, until further notice, we shall understand *a Term expressive of a class*

- (1) in which the Subject is asserted to be, wholly or partially, included;
- (2) from which the Subject is asserted to be, wholly or partially, excluded.

We have thus FOUR distinct classes of Logical Proposition,

1. AFFIRMATIVE, in which the Predicate includes the whole Subject.
2. in which the Predicate includes only part of the Subject.
3. NEGATIVE, in which the Predicate excludes the whole Subject.
4. in which the Predicate excludes only part of the Subject.

NOTE THAT

1 and 3 are called *Universal* { Affirmative,
Negative.

2 and 4 *Particular* { Affirmative,
Negative.

The SIGNS OF QUANTITY are

for Universal Propositions, ALL,

for Particular Propositions, SOME.

But NOTE THAT the usage of our own language necessitates a modification of the SIGN "ALL" in the case of a Negative Proposition.

Thus: of the Proposition "*All men — infallible,*" the true meaning is "*All men are excluded from the class 'Infallible.'*"

But, if it is translated into ordinary English and written, "*All men are not infallible,*" it would be taken as implying "*Some men are, and some are not, infallible.*"

For this reason only the SIGN OF QUANTITY in an Universal Negative Proposition is NO or NONE: i. e. instead of

"The whole of the Subject is excluded from" } the Predicate.
 "No part of the Subject is included in"

The **SYMBOLS** commonly used are,
 for the Universal Affirmative, **A.**
 Negative, **E.**
 .. Particular Affirmative, **I.**
 Negative, **O.**

and these Symbols are, as a matter of convenience, generally substituted for the longer form.

Examples.

SYMBOL.	SIGN OF QUANTITY.	SUBJECT.	COPULA.	PREDICATE.
A	All	men	+	mortal.
E	No	men	—	infallible.
I	Some	men	+	dishonest.
O	Some	men	—	dishonest.

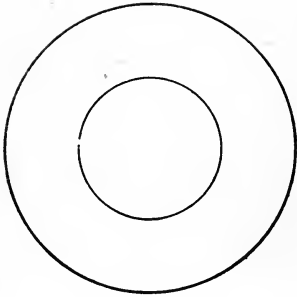
The relation of **SUBJECT** and **PREDICATE** in each may be illustrated thus:—

In **A**, by two concentric circles, the smaller representing the **SUBJECT**, the larger the **PREDICATE**.

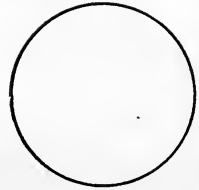
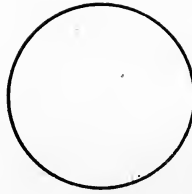
In **E**, by two circles, of any relative size, whose circumferences do not intersect each other.

In **I** and **O**, by two circles, of any relative size, whose circumferences do intersect each other.

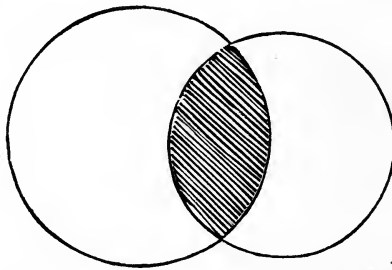
A



E



I or O



NOTE, I. that, since several grammatical words may be required to convey a single idea, *SUBJECT and PREDICATE may each consist of several such words, but will still be each ONE TERM.* Just as the same value may be represented by one gold coin, 20, 40, 60, or 80 silver ones, &c. &c.

Example.

“The annual labour of
every nation

+

the fund which originally
supplies it with all the
necessaries and conve-
niences of life which it
annually consumes.”

Languages differ much in the power of concisely representing ideas.

Thus a Logical Proposition of which in Greek the SUBJECT and PREDICATE are each one word cannot be adequately expressed in English by words fewer than the following :—

SUBJECT.	COPULA.	PREDICATE.
“ No man in whom Reason, after a struggle, holds in check the bodily Appetites	—	arrived at that state in which the bodily Appetites have been trained never to re- bel against Reason.”

II. *The Logical SUBJECT or PREDICATE is the same whatever may be the grammatical disguise.*

For instance,

“ *Nothing is sweeter than honey* ” = Honey + than which
 nothing is sweeter.

“ *Fools make a mock at sin* ” = All who make a mock at sin
 + Fools.

This may be more fully illustrated in translating from other languages. But in order to read our own correctly it is often essential to determine what is the Logical Subject or Predicate. Shall we lay the emphasis (above) on *Fools* or on *Sin*?

This is best exemplified *vivá voce* : but Whately's example is excellent ;

“ The Organon of Bacon was not designed to supersede
 the Organon of Aristotle.”

This proposition admits of as many interpretations as there are verbs and substantives in it : they are capable of being expressed by emphasizing each in turn.

CHAPTER II.

DISTRIBUTION OF TERMS.

A Term is said to be *distributed* when it denotes all that it is capable of denoting; *undistributed* when it denotes less.

All Terms are

either *Singular*—capable only of denoting an Individual; or *Common*—capable of denoting many individuals and each of them.

A SINGULAR TERM is always distributed, because it cannot denote less than all the Individual. No Proposition being in strict Logical Form unless the sign of Quantity is prefixed, the distribution or non-distribution of THE SUBJECT is obvious at once : hence

Rule I. *All Universal Propositions distribute the SUBJECT.*
No Particular Propositions distribute the SUBJECT.

An Affirmative Proposition is “that in which the Subject is asserted to be, wholly or partially, included in the Predicate;” how much beside that Subject the Predicate is capable of including is immaterial : hence

Rule II. *No Affirmative Propositions necessarily distribute the Predicate :* it is therefore *assumed* that no such Propositions do distribute it.

Again, a Negative Proposition is "that in which the Subject is asserted to be, wholly or partially, excluded from the Predicate."

Now that from which any thing is excluded must be spoken of in its entirety.

(No amount of wire fencing will keep rabbits out of a flower garden, if a gap of six inches be left :) hence

Rule III. *All Negative Propositions necessarily distribute THE PREDICATE.*

Summary.

In E, *both* SUBJECT AND PREDICATE are distributed.

I, *neither* SUBJECT NOR PREDICATE are distributed.

A, THE SUBJECT *only* is distributed.

O, THE PREDICATE *only* is distributed.

OR,

E distributes both Terms,

I distributes neither,

A distributes the Subject *only*,

O distributes the Predicate *only*.

Simple as all this is, it should be thoroughly taken in by the memory before the learner goes any further.

This done, we may proceed to consider

CHAPTER III.

CONVERSION OF PROPOSITIONS.

A Proposition is CONVERTED,

When the Terms are transposed, the Copula remaining unchanged.

The only RULE is,

No Term may be distributed in the CONVERSE (i.e. Proposition, when converted) which was not distributed in the original Proposition. Hence

I. Since it is assumed that in no affirmative Proposition is the Predicate distributed, *the limiting (or Particular) sign SOME must be prefixed to the Subject of the Converse of every affirmative Proposition.*

II. Since in every Universal Negative Proposition both Terms are distributed,

No change of sign of Quantity is necessary in the Converse of any Universal Negative Proposition.

Examples.

A	All Squares	+	Rectangles.
I	Some Rectangles	+	Squares.
I	Some Parallelograms	+	Squares.
I	Some Squares	+	Parallelograms.
E	No Squares	-	Pentagons.
E	No Pentagons	-	Squares.

But, since the truth of every Universal Proposition implies the truth of the Particular Proposition having the same Subject, Copula, and Predicate, we may also say,

O Some Pentagons — Squares.

Summary.

A	after Conversion becomes	I.
I	after Conversion becomes	I.
E	after Conversion becomes	E.
E	after Conversion <i>may become</i>	O.

NOTE. Because I and E after Conversion remain unaltered as to sign of Quantity their Conversion has been usually distinguished by the name SIMPLE.

This, I think, is a mistake.

There is but one Rule and Method of Conversion, although the application of it produces a change in the form of A, none in that of I or of E.

But why is nothing said of O?

Because it cannot be converted. Its SUBJECT, not being distributed, would, by transposition, become distributed as PREDICATE of a Negative Proposition; and thus the only Rule of Conversion is at once broken by the act of transposition.

Example.

O	Some Triangles	—	Equilateral.
	Equilateral	—	Triangles.

The Term *Triangles*, undistributed as the SUBJECT of O, a particular Proposition, becomes distributed as PREDICATE of a Negative Proposition.

But although O is incapable of Conversion it is easily changed into an equivalent I, and that I is convertible.

Whatever x may stand for, all things are divisible into x and not- x . Therefore to assert that any SUBJECT is included in not- x is equivalent to asserting that it is excluded from x .

Example.

{	O	Some Triangles	—	Equilateral
			is equivalent to	
{	I	Some Triangles	+	not-Equilateral
			whose Converse is	
	I	Some not-Equilateral	+	Triangles.

The only difficulty in Conversion lies in bringing Propositions from their ordinary, colloquial or written, form into the strict Logical form; that is, really, in getting at their meaning. When a Proposition has been brought into the strict Logical form, the more mechanically the process of Conversion is performed the better; for the less is the chance of error.

But the difficulty is a real one; and in the overcoming it consists almost the only educational value of the process.

(A few examples are given; but any intelligent learner may easily multiply them to any extent. In each, the Proposition in its ordinary form is bracketed with the strict Logical, and the Converse subjoined.)

{	A	Better late than never.		
		To do late	+	better than to do never.
	I	Some better than to do never	+	to do late.

{	Only the good are happy.	—	
	E No not-good	—	happy.
	E No happy	—	not-good.

{	Not every tale is to be believed.		
	O Some tales	—	to-be believed.
	I Some tales	+	not-to-be believed.
	I Some not-to-be believed	+	tales.

{	All is not gold that glitters.		
	O Some glittering	—	gold.
	I Some glittering	+	not-gold.
	I Some not-gold	+	glittering.

The story may be true.

That the story is true

Some possible

+ possible.

+ that the story is true.

(The next two examples illustrate an *use* of Conversion.)

{	Fools make a mock at sin.		
	A Fools	+	making a mock at sin.
	I Some making a mock at sin	+	Fools. (Vapid.)

{	Fools make a mock at sin.		
	E No not-Fools	—	make a mock at sin.
	E None making a mock at sin	—	not-Fools.

i.e., "All who make a mock at sin are Fools;" *or*, "to make a mock at sin is a *proof* of folly."

- | | | | |
|---|---|---|------------------------------------|
| { | Self-love is not inconsistent with Benevolence. | | |
| A | Self-love | + | not-inconsistent with Benevolence. |
| I | Some not-inconsistent with Benevolence | } | + Self-love. |

But the same may be asserted (ordinarily) of eating one's dinner.

- | | | | |
|---|---|---|--------------------------------|
| { | Self-love is not inconsistent with Benevolence. | | |
| E | Self-love | - | inconsistent with Benevolence. |
| E | No inconsistent with Benevolence | - | Self-love. |

Thus treated, the original Proposition is seen to contain an important Principle of Morals.

We have next to consider

CHAPTER IV.

OPPOSITION OF PROPOSITIONS.

To be OPOSED, Propositions must

- I. have exactly the same SUBJECT and PREDICATE ;
- II. differ
 - (a) in Sign of Quantity *only*,
 - (b) in Copula *only*,
 - (c) *both* in Sign of Quantity and in Copula.

In (a) the Opposition is called SUBALTERN.

In (b) CONTRARY.

In (c) CONTRADICTIONARY.

(It will, however, be seen afterwards that (b) is divided into CONTRARY and SUB-CONTRARY.)

It has been disputed, somewhat uselessly, whether the doctrine of Opposition involves Inference.

I think it sufficient to say that it teaches

“ Any one Proposition being assumed to be true or false, what may be known respecting others containing exactly the same SUBJECT and PREDICATE.”

The best way of arriving at its Laws is by experiment.

We must take account of what is termed the

MATTER OF PROPOSITIONS ; *i. e.*, the relation which in the

nature of things exists, or which is supposed to exist, between any two Terms before they are placed in any Proposition.

This relation may be such, that

- I. One term is invariably included in the other.
- II. One term is invariably excluded from the other.
- III. One term is sometimes included in, and sometimes excluded from, the other.

Two Terms standing in

Relation	I. are said to be in	NECESSARY	}	Matter.
	II.	in IMPOSSIBLE		
	III.	in CONTINGENT		

(NOTE ESPECIALLY that all the Propositions which can be formed with exactly the same SUBJECT and PREDICATE are in the same Matter. Thus, assuming that Man and Infallible are in IMPOSSIBLE Matter,

All men	+	Infallible (false),
No men	-	Infallible (true),
Some men	+	Infallible (false),
Some men	-	Infallible (true),

are all Propositions in IMPOSSIBLE Matter.)

On very slight consideration we find that

In NECESSARY Matter, A and I are true,
E and O are false.

In IMPOSSIBLE Matter, A and I are false,
E and O are true.

In CONTINGENT Matter, A and E are false,
I and O are true.

These facts are usually represented in the manner following,
(N. I. C. denoting the kinds of Matter.)

$\left. \begin{array}{l} \text{N true} \\ \text{I false} \\ \text{C false} \end{array} \right\}$	A	CONTRARIES.	E	$\left\{ \begin{array}{l} \text{N false.} \\ \text{I true.} \\ \text{C false.} \end{array} \right.$
--	---	-------------	---	---

SUBALTERNNS.

CONTRADICTORIES.
CONTRADICTORIES.

SUBALTERNNS.

$\left. \begin{array}{l} \text{N true} \\ \text{I false} \\ \text{C true} \end{array} \right\}$	I	SUB-CONTRARIES.	O	$\left\{ \begin{array}{l} \text{N false.} \\ \text{I true.} \\ \text{C true.} \end{array} \right.$
---	---	-----------------	---	--

Reading horizontally at the top, we find that A and E are never both true, but may be both false.

Reading horizontally at the bottom, that I and O are never both false, but may be both true.

Reading diagonally, that $\left\{ \begin{array}{l} \text{A and O} \\ \text{E and I} \end{array} \right\}$ are never both true, and never both false.

Reading vertically downwards, that
 where A is true, I is true ;
 where E is true, O is true.

Reading vertically upwards, that
 where I is false, A is false ;
 where O is false, E is false.

Summary.

CONTRARIES cannot be both true, may be both false.

SUB-CONTRARIES cannot be both false, may be both true.

CONTRADICTIONARIES cannot be both false, cannot be both true.

In SUBALTERNES, the truth of the Universal implies that of the Particular ;
the falseness of the Particular implies that of the Universal.

It is, perhaps, worth while to note that a Proposition having for its SUBJECT a Singular Term can only be opposed to its CONTRARY, since the Quantity of the Proposition cannot be altered.

Extracts from the remarks of Mr. Mill, on the Processes of Opposition and Conversion.—("System of Logic," 4th edition, pp. 184, 185.)

"In a manual for young students it would be proper to dwell at greater length on the CONVERSION and ÆQUIPOLLENCY of Propositions.

For, although that cannot be called Reasoning or Inference which is a mere reassertion, in different words, of what had been asserted before, there is no more important intellectual habit, nor any the cultivation of which falls more strictly within the province of the Art of Logic, than that of discerning rapidly and surely the identity of an assertion, when disguised under diversity of language. And the student of Logic, in the discussion even of such truths as we have cited above, acquires habits of circumspect interpretation of words, and of exactly measuring the length and breadth of his assertions, which are among the most indispensable conditions of any considerable mental attainment, and which it is one of the primary objects of Logical discipline to cultivate."

PART II.

CHAPTER I.

OF SYLLOGISM.

SYLLOGISM is *that kind of reasoning in which two, or more, Propositions being assumed^a, some other Proposition must result from the Propositions so assumed.*

These Propositions may be

- (a) **CATEGORICAL**, which assert absolutely; (for example, "A B + deserving of death.")
- (b) **HYPOTHETICAL**, which assert the dependence of one Categorical Proposition upon another; for example, "If A B + traitor A B + deserving of death ;"

or, "The assertion + either mistaken or malicious"

= {
If the assertion — mistaken it + malicious.
 — malicious it + mistaken.
 + mistaken it — malicious.
 + malicious it — mistaken.

^a See page 3.

We shall treat first of that kind of SYLLOGISM in which Categorical Propositions are assumed, and which is therefore named CATEGORICAL SYLLOGISM.

Every SYLLOGISM consists of TWO PARTS :

- I. *The Propositions assumed* = the ANTECEDENT.
 II. *The Proposition necessarily resulting* = the CONSEQUENT.

The former is commonly called, "The PREMISES ;"
 (more properly the Premisses, *i.e.* Propositiones Præmissæ.)

The latter is commonly called, "The CONCLUSION."

When, however, a Proposition is assumed, and the purpose is to find what other Propositions must be maintained with it^b, such Proposition is named "The QUESTION."

OF SIMPLE CATEGORICAL SYLLOGISM.

The simplest form of SYLLOGISM, from which the Rules of all may be gathered, is *that which consists*

of only two assumed Propositions = PREMISES,
and of the Proposition necessarily resulting from them = CONCLUSION.

In order to *construct* such a SYLLOGISM, we must begin (as in all construction) from the bottom; *i.e.* from the QUESTION.

Is some A included in B ?

Is all A included in B ?

Is some A excluded from B ?

Is all A excluded from B ?

^b See page 3.

The answer to each must be affirmative or negative ; and it is to the answer that the name "the QUESTION" will henceforth be given.

To prove such QUESTION it is necessary to employ SOME THIRD TERM (say C), with which each Term of the QUESTION may (as it is commonly said) "be compared," *i.e.* stand as SUBJECT or PREDICATE in a Premiss.

Rule A.—To prove an AFFIRMATIVE QUESTION,
The THIRD TERM must be such that each Term of the QUESTION can stand with it in an Affirmative Premiss.

Rule B.—To prove a NEGATIVE QUESTION,
The THIRD TERM must be such that one Term of the QUESTION can stand with it in an Affirmative Premiss, while the other stands with it in a Negative Premiss.

Examples.

(1) All A + C.
 All C + B.
 All A + B.

(2) Some A + C.
 All C + B.
 Some A + B.

(3) All A + C.
 No C - B.
 No A - B.

(4) Some A + C.
 No C - B.
 Some A - B.

NOTE THAT in Syllogism (1)

B is the greatest, *i.e.* most comprehensive, Term employed :
 A smallest, least

C, including A and being included in B, is, in respect of comprehensiveness, MIDDLE.

Hence, for convenience, in *all* SIMPLE CATEGORICAL SYLLOGISMS,

The Subject of the Question (or Conclusion) is named
MINOR TERM.

The Predicate of the Question (or Conclusion) is named
MAJOR TERM.

The Third Term employed in each Premiss is named
MIDDLE TERM.

The PREMISES are similarly named :

That in which the Major Term occurs is named MAJOR
PREMISS.

That in which the Minor Term occurs is named MINOR
PREMISS.

[The Student will do well to pause and refresh his memory of the Rules of Distribution of Terms in each kind of Proposition (see page 9) before he proceeds to consider]

CHAPTER II.

THE RULES OF SIMPLE CATEGORICAL SYLLOGISM.

Of these, those hereafter numbered 1, 2, 3, 6, 7 are obviously implied in the two given above for proving QUESTIONS, whether Affirmative or Negative.

1. *Three, and not more than three, distinct Terms may be employed.*

2. *Three, and not more than three, distinct Propositions may be employed.*

3. *The third (Middle) Term must not be ambiguous in itself.*

[Nor by its position.

Neither the SUBJECT of a Particular Premiss, nor the PREDICATE of an Affirmative Premiss, is distributed. But, unless the Middle Term has been once distributed, we cannot know that in each Premiss we are intending to use the *same* Term. If, on the contrary, it has been distributed in one Premiss, however small a portion of it may be intended in the other, that portion has been used before. Hence we have]

4. *The Middle Term must always be once distributed ; i.e. it must be either the SUBJECT of an Universal* } Premiss.
or the PREDICATE of a Negative }

Examples of Middle Term Undistributed.

- (1) All scarlet-fever-patients + having sore throat.
 A B + having sore throat.
 A B + scarlet-fever-patient.
- (2) Some having sore throat + scarlet-fever-patients.
 A B + having sore throat.
 A B + scarlet-fever-patient.

In the first example, it is clear that the MIDDLE TERM "having sore throat" may include "All scarlet-fever-patients" and "A B," and yet the two latter Terms are not necessarily connected.

In the second, that one part of "having sore throat" may include "A B," while a different part may be included in "scarlet-fever-patients."

5. Neither Term in the QUESTION (or CONCLUSION) may be distributed, unless it is also distributed in the Premiss in which it stands.

The violation of this Rule is called **ILLICIT PROCESS**
 of the Major Term when the PREDICATE } is wrongfully
 of the Minor Term when the SUBJECT } distributed.

But the PREDICATE can only be distributed in a Negative Proposition, and the SUBJECT only in an Universal Proposition: consequently,

Illicit Process of the Major Term implies that the QUESTION (or CONCLUSION) is Negative when it ought to be Affirmative.

Illicit Process of the Minor Term, that it is Universal when it ought to be Particular.

The Conclusion ought to result necessarily from the Premisses. More cannot result from less (if a man owes me £5, I may not demand £6): less may result from more (if a man owes me £5, I may accept any less sum).

Consequently, it is not necessary that either Term in the QUESTION (or CONCLUSION) shall be distributed; although it may have been distributed in the Premiss in which it stands.

6. *Two Negative Premisses are inadmissible.*

Such case not being contemplated in Rules A or B.

7. *If either Premiss is negative, the Conclusion must be negative.*

Because, by the last Rule, the other Premiss must be affirmative, and Rule B applies.

8. *Two Particular Premisses are inadmissible.*

Suppose the Premisses to be I and I: then the Middle Term cannot be distributed.

Suppose them to be O and I, (since, by Rule 6, O and O are inadmissible.)

Since in O and I only one Term is distributed (and that *must* be the Middle Term), neither Term of the Conclusion can be distributed.

But by Rule 7 the Conclusion must be negative, since there is a negative Premiss. Therefore, the Major Term will be distributed in the Conclusion, undistributed in the Major Premiss: and then Rule 5 is broken.

Briefly. Two Particular Premisses must cause,
 either *Non-distribution of the Middle Term*;
 or *Illicit Process of the Major Term*.

9. *A Particular Premiss necessitates a Particular Conclusion.*

Such Particular Premiss must be I or O.

With I may be associated E or A (not I or O, both being Particular).

With O may be associated only A (not I or O, both being Particular; not E, being Negative).

The cases then will be,

- | | | | |
|----|---|---|--|
| 1. | { | I distributing no Term
A only one. | { <i>Since the Middle Term must be distributed, here no distribution is possible in the Conclusion, which must therefore, ex abundanti, be Particular.</i> |
| 2. | { | I distributing no Term
E two Terms. | |
| 3. | { | O one only
A one only. | |
| | | | { <i>In each of these cases one distribution is allowable in the Conclusion. But, by Rule 7, the Conclusion must be negative, i.e. distribute its Predicate: therefore, by Rule 5, the Subject may not be distributed.</i> |

MODES (OR MOODS) OF SIMPLE CATEGORICAL SYLLOGISM.

The MODE (or MOOD) simply means *the enumeration of the Vowels symbolising the three Propositions of which a Simple Categorical Syllogism consists.*

Thus, on page 21,

The Mode of (1) is A A A.

(2) I A I.

(3) A E E.

(4) I E O.

The possible combinations of these four Vowels in threes are, of course, 64.

The Student will find it useful to make these combinations for himself; and then, in order to fix in his memory the chief General

Rules, to ascertain how many of such combinations are inadmissible when tested by those Rules.

Apply, *first*, the Rules affecting the Premisses, viz.

- | | | |
|------------------|---|-----------------------------|
| (a) Two Negative | } | Premisses are inadmissible. |
| (b) Particular | | |

Next, the Rules regulating the dependence of the Conclusion on the Premisses, and of the Premisses on the Conclusion, viz.,

- (a) A Negative Premiss necessitates a Negative Conclusion.
- (b) A Conclusion implies Premiss.
- (c) A Particular Premiss necessitates a Particular Conclusion.

It will be found that only 12 Moods survive the ordeal.

But the process is really superfluous ; for we have next to consider

THE FIGURES OF SIMPLE CATEGORICAL SYLLOGISM.

The **FIGURE** of any such Syllogism is determined by the position held in each of its Premisses by the (Third or) MIDDLE TERM.

This may be	and the Figure is then named	
<i>Subject of both Premisses</i>	Third.	
<i>Predicate of both</i>	Second.	
{ <i>Subject of the Major Premiss</i>	}	First.
{ <i>Predicate of the Minor</i>		
{ <i>Predicate of the Major Premiss</i>	}	Fourth.
{ <i>Subject of the Minor</i>		

(The Fourth Figure is useless, and may, in practice, be disregarded.)

Since each Premiss contains the Middle Term and one of the Terms of the Question or Conclusion, it is clear that *given the place held by the Middle Term, we know also the place, in its own Premiss, of either of the other two.*

The application of the General Rules of Syllogism to these known facts limits the capability of each Figure : these limitations have the name of **SPECIAL RULES OF THE FIGURES.**

It would be possible, of course, for the Student to discover these special Rules for himself ; but the annexed Memoria Technica supplies them, and we need only concern ourselves with the proof of them.

[In making use of it, it must be understood that
 the Symbol of the Major Premiss is placed first,
 Minor second,
 Conclusion last.

What denominates each Premiss is the presence of Major or of Minor Term : the order in which the Premisses are stated is, in itself, wholly immaterial. There are other uses of the Memoria Technica, which need not at present be noticed. *The Vowels in each Mood, and their order, is all we have now to regard.*

SIMPLE CATEGORICAL SYLLOGISM.

FIGURES OF:

SUBJECT.	COPULA.	PREDICATE.
<i>Major Prem.</i> _____		_____ Fig. I.
<i>Minor</i> _____		_____
Conclusion _____		_____
<i>Major Prem.</i> _____		_____ Fig. II.
<i>Minor</i> _____		_____
Conclusion _____		_____
<i>Major Prem.</i> _____		_____ Fig. III.
<i>Minor</i> _____		_____
Conclusion _____		_____
<i>Major Prem.</i> _____		_____ Fig. IV.
<i>Minor</i> _____		_____
Conclusion _____		_____

LEGITIMATE MOODS OF:

(Memoria Technica.)

- I. BARbArA, CEIArEnt, DArII, FErIO que *Prioris*.
 II. CEsArE, CAMEstREs, FEstInO, BAROkO, *Secundæ*.
 III. { *Tertia*—DARApTI, DIsAmIs, DAtIsI, FEIApTO,
 BOkArDO, FErIsOn, habet. *Quarta* insuper addit
 IV. BrAmAntIp, CAMEnEs, DImArIs, FEsApO, FrEsIsOn.

Quinque subalterni * totidem Generalibus orti
 [BARbArI, CEIArOnt, CEsArO, CAMEstROs, CAMEnOs,]
 Nomen habent nullum nec, si benè colligis, usum.

* Conclusions being *Particular*, when they might have been *Universal*.

Assuming that this Memoria Technica is trustworthy, we will ascertain from it the FACTS respecting each FIGURE.

FIGURE I. In each Mood

The first vowel is either A or E (not I or O);
hence, FACT 1—*The Major Premiss is always Universal.*

The second is A or I (not E or O);
hence, FACT 2—*The Minor Premiss is always Affirmative.*

The third is A, E, I or O;
hence, FACT 3—*The Conclusion is unrestricted.*

Applying the same kind of inspection to the remaining Figures we have the following results, viz.

FIGURE II.

- FACT 1. *The Major Premiss is always Universal.*
2. *The Minor* *unrestricted.*
3. *The Conclusion* *always Negative.*

FIGURE III.

- FACT 1. *The Major Premiss is unrestricted.*
2. *The Minor* *always Affirmative.*
3. *The Conclusion* *Particular.*

If these Facts can be accounted for, we shall prove them to be Rules.

In doing this it is necessary to remember,

- (a) the position of the Middle and Major, Middle and Minor, Terms in the Premisses in each Figure;
(b) the chief general Rules of Simple Categorical Syllogisms: viz.

4. The Middle Term must be Subject of an Universal, or Predicate of a Negative, Premiss.
5. Against Illicit Process of Major or of Minor Term.
6. Two Negative Premisses are inadmissible.
7. A Negative Premiss necessitates a Negative Conclusion.
8. Two Particular Premisses are inadmissible.

Proofs of the Special Rules of the Figures.

FIGURE I. RULE 1.

The Minor Premiss must be Affirmative.

For suppose it Negative, then

(by Rule 6) the Major Premiss must be Affirmative,

(by Rule 7) the Conclusion Negative ;

then the Major Term, undistributed as Predicate of the Affirmative Major Premiss, will be distributed as Predicate of the Negative Conclusion ; and Rule 5 will be broken.

∴ *The Minor Premiss must be Affirmative.* Q. E. D.

FIGURE I. RULE 2.

The Major Premiss must be Universal.

For suppose it Particular, then

The Middle Term, holding the place of Subject, is not distributed ; neither can it be distributed as Predicate of the Minor Premiss (which, by Rule 1, must be Affirmative), and Rule 4 will be broken.

∴ *The Major Premiss must be Universal.* Q. E. D.

FIGURE II. RULE 1.

One of the Premisses must be Negative.

Else Rule 4 will be broken, since the Middle Term is Predicate of both Premisses.

∴ *One of the Premisses must be Negative.* Q. E. D.

Corollary (by Rule 7),

The Conclusion must be Negative.

FIGURE II. RULE 2.

The Major Premiss must be Universal.

Since, by the Corollary to Rule 1, the Conclusion is Negative, the Major Term must be in it distributed; but as Subject of the Major Premiss it could not be distributed if that Premiss were Particular, and so Rule 5 would be broken.

∴ *The Major Premiss must be Universal.* Q. E. D.

FIGURE III. RULE 1.

The Minor Premiss must be Affirmative.

[Proof the same as for Figure I.]

FIGURE III. RULE 2.

The Conclusion must be Particular.

The Minor Term is Predicate of the Minor Premiss, which, by the last Rule, is Affirmative :

∴ the Minor Term is not therein distributed :

but if the Conclusion were Universal, the Minor Term (being its Subject) would be distributed, and thus Rule 5 would be broken.

∴ *The Conclusion must be Particular.* Q. E. D.

Summary of the Special Rules of the Figures.

FIGURE I.

- (1) Minor Premiss Affirmative, *else* Illicit Process of Major Term.
- (2) Major Premiss Universal, *else* Middle Term undistributed.

FIGURE II.

- (1) One Premiss Negative, *else* Middle Term undistributed.
- (2) Major Premiss Universal, *else* Illicit Process of Major Term.

FIGURE III.

- (1) Minor Premiss Affirmative, *else* Illicit Process of Major Term.
- (2) Conclusion Particular, *else* Illicit Process of Minor Term.

(It is well to charge the memory with thus much.

The Proofs will best be remembered by practising the statement of them.

If the Rules be forgotten, they may always be gathered as Facts from the Memoria Technica, if it be known, as it should be, by rote.)

At this point the Student will do well to exercise himself *thoroughly* in the Moods of Figures I, II, III.

Let him take Symbols as Terms, say

X for Minor Term,

Y Major ,

Z Middle ,

and construct Syllogisms, *beginning always from the QUESTION.*

Thus, suppose it be required to construct Syllogisms in dArII, fErIsOn, cEsArE, cElArEnt;

First, state the Quæstio, affix its symbol, add the name of the Mood required.

d Ar	f Er
I	Is
I Some X + Y.	On Some X - Y.
c Es	c El
Ar	Ar
E No X - Y.	Ent No X - Y.

Next, fill in Signs and Copulae of the Premisses.

d Ar All +	f Er No -
I Some +	Is Some +
I Some X + Y.	On Some X - Y.
c Es No -	c El No -
Ar All +	Ar All +
E No X - Y.	Ent No X - Y.

Lastly, place the Middle Term, and then the Major and Minor Terms.

d Ar All Z + Y	f Er No Z - Y
I Some X + Z	Is Some Z + X
I Some X + Y.	On Some X - Y.
c Es No Y - Z	c El No Z - Y
Ar All X + Z	Ar All X + Z
E No X - Y.	Ent No X - Y.

When thus familiarised with the various Moods and Figures, he should proceed to construct Syllogisms with *significant* Terms in the Question.

FIRST, *Write down the Quæstio in strict Logical form (i. e. Sign of Quantity—Subject—Copula—Predicate), and affix the Symbol (A, E, I or O).*

NEXT, *Choose in what Mood of which Figure the Syllogism shall be constructed ; (remembering that no Affirmative Question can be proved in Fig. II; Universal in Fig. III).*

NEXT, *as before, write down the name of that Mood.*

LASTLY, *fill in Signs and Copulæ, and place the Terms of the Question in their proper places, leaving void the place of the Middle Term.*

His Syllogism will then stand as in the following example :—

c	El	No	—	valid.
	Ar	This deed	+	
	Ent	This deed	—	valid.

LOGIC *has now done all that it can, or professes to, do ; it has shewn to what conditions the Third or Middle Term when found must conform.*

It does not profess to find Middle Terms ; and, however absurd may be the Middle Term inserted, the validity of the Inference remains untouched : (although, of course, absurdity in the Conclusion arrived at guides the disputant to the absurd assumption or assumptions.)

Suppose I choose “Printed” as the Middle Term of the Syllogism above. If the Premisses are conceded the Conclusion must follow from them, and there would be no patent absurdity in the Conclusion.

If I want a really available Middle Term (or, as it used to be well named "Argument"), I must go to the legal practitioner, who would supply such as the following:—

"Insufficiently stamped"—"Not duly attested"—

"Obtained by fraud"—"Executed under compulsion."

Assuming him to know his business, the only chance of upsetting the Conclusion would be the possible falseness of the Minor Premiss.

Similarly, to prove "This man died of poisoning by arsenic," or "by strychnine," I must go to the medical man; and my only difficulty will be in the proof of my Minor Premiss.

What Moods and Figures to select must, after all, remain to be picked up by practice.

But in replying to a Syllogism the Rules of Opposition guide us.

If my adversary's Conclusion rests upon an Universal Premiss, I elect to prove, not its Contrary but, its Contradictory; which, if true, is incompatible with the truth of his Premiss and is easier of proof than the Contrary.

For this purpose, the third Figure is generally most convenient; because, as the Middle Term never stands as Predicate, a Singular Term will serve my purpose.

Say his Major Premiss has been—

"All Clerical Justices of the Peace are Liars;"

My answer would be,

f El A B — Liar.

Apt A B + Clerical Justice of the
Peace.

On ∴ Some C.J. of P. — Liar.

Did I attempt to prove the Contrary of his Major Pre-
miss I should find it difficult.

*The analysis of Reasoning, as it is found in ordinary lan-
guage, must be aided by instinct founded on practice.*

It will generally be found easy to extract the Conclusion
arrived at, state it in strict logical form, and then try it by
the Rules.

Take for example the following :

“ The cry of animals cannot always be depended upon as
a proof that they are suffering pain. What a noise a pig
will make when merely laid hold of ! ”

Here I take the statement controverted to be

A “ All crying animals + suffering pain.”

The laws of Opposition shew that the Contradictory is
maintained by the writer,

O “ Some crying animals – suffering pain.”

I adopt the Mood fEl Apt On.

fEl No pigs merely laid hold of – suffering pain.

Apt All pigs + crying animals.

O Some crying animals – suffering pain.

Or this,

“ Those fellows not pirates ! why, they'd British Bunting
aboard ! now they couldn't have bought it.”

The position which the speaker lays down is,

A Those fellows + pirates.

The Syllogism is,

b Ar All having unbought, &c. + pirates.

b Ar Those fellows + having unbought, &c.

A Those fellows + pirates.

CHAPTER II.

OF ABBREVIATED OR ELLIPTICAL FORMS OF SYLLOGISM.

No one ever writes or speaks complete Syllogism.

The most usual form of ABBREVIATION is a Simple Categorical Syllogism, in the First Figure, from which one Premiss is omitted.

Speaking popularly, we either state the Principle and leave the Fact to be implied, or *vice versâ*.

Speaking technically, we either express the Major Premiss and leave the Minor Premiss to be implied, or *vice versâ*.

For example,

“Duelling is not socially-expedient: nothing morally wrong can be so.”

Or,

“Duelling is not socially-expedient because it is morally wrong.”

The Syllogism in its completeness being,

c El	No morally-wrong	—	socially-expedient.
Ar	All duelling	+	morally wrong.
Ent	No duelling	—	socially-expedient.

The Abbreviations above are named ENTHYMEME.

Some ENTHYMEMES admit of compression into a single Grammatical Proposition, which is then named ENTHYMATIC SENTENCE. Thus—

“ Duelling being morally-wrong is not socially-expedient.”

Another form of ABBREVIATION is that by which is omitted the Conclusion, sometimes one of the Premisses also, the person with whom we are arguing being presumed able to supply the omission.

This is chiefly applied to the third Figure.

Suppose my adversary's argument to have rested on, or his simple assertion to be,

“ All rich people are hard hearted :”

I reply, “ A. B. is not hard hearted, yet he is rich ;”

or, “ A. B. is not hard hearted.”

“ All eccentric people are clever :”

I reply, “ A. B. is eccentric, but he is not clever ;”

or, “ A. B. is not clever ;”

or, “ A. B. is eccentric ;”

accordingly as the presence of eccentricity or the absence of cleverness in A. B. is the more notorious.

The complete Syllogisms being respectively

	f El	A. B.	—	hard hearted.
	Apt	A. B.	+	rich.
	On	Some rich	—	hard hearted.
and	f El	A. B.	—	clever.
	Apt	A. B.	+	eccentric.
	On	Some eccentric	—	clever.

(The reason why this Figure of Syllogism is selected is that, since in this Figure alone the Middle Term is never Predicate, a Singular Term will serve the purpose.)

OF THE ABBREVIATION OF SEVERAL CONNECTED SIMPLE CATEGORICAL SYLLOGISMS.

A Question may require for its proof more than one Simple Categorical Syllogism: *i.e.*, one or both of its Premises may become Questions in their turn. All the Syllogisms thus necessitated may be abbreviated in the form named

SORITES.

SORITES is *an abbreviation of two or more connected Simple Categorical Syllogisms in Figure I: in whose Antecedent the Minor Term is Subject of the first Premiss, the Major Term is Predicate of the last Premiss: the Middle Terms being alternately Predicates and Subjects of the Premisses.*

Example.

A B	+	human	}	<i>Antecedens.</i>
All human	+	animal		
All animal	+	living		
All living	+	corporeal		
No corporeal	-	immortal		
A B	-	immortal		<i>Consequens.</i>

Commencing with the Consequens (= Question or Conclusion) we obtain the following Simple Categorical Syllogisms :—

(The Figures 1, 2, 3, 4 denote the order of *Construction* ;
A, B, C, D the order of *Statement*.)

	c El	No corporeal	-	immortal.	
(D)	Ar	A B	+	corporeal.	(1)
	Ent	A B	-	immortal.	
	b Ar	All living	+	corporeal.	
(C)	b Ar	A B	+	living.	(2)
	A	A B	+	corporeal.	
	b Ar	All animal	+	living.	
(B)	b Ar	A B	+	animal.	(3)
	A	A B	+	living.	
	b Ar	All human	+	animal.	
(A)	b Ar	A B	+	human.	(4)
	A	A B	+	animal.	

Upon comparison of the Sorites with these Syllogisms into which it is expanded (1, 2, 3, 4) we find the following

FACTS OF SORITES.

1. The whole number of Propositions being 6,
..... Syllogisms is 4. (=the number of
intermediate Propositions.)
2. All the *intermediate* Propositions are Major Premisses of Syllogisms in Fig. I.
3. The only *expressed* Minor Premiss is the first Proposition in the Sorites.
4. All the *suppressed* Minor Premisses are Conclusions, in each case, of the Syllogism immediately preceding.

Hence we derive the

RULES OF SORITES.

1. *Every Sorites may be expanded into as many Simple Categorical Syllogisms in Fig. I. as there are intermediate Propositions in it.*
2. *Every intermediate Premiss must be Universal (by Special Rule 2 of Fig. I).*
3. *The first Premiss alone may be Particular (because it alone does not serve as a Major Premiss).*
4. *No suppressed Conclusion may be Negative (by Special Rule 1 of Fig. I).*
5. *Nor any Premiss which produces a suppressed Conclusion (by General Rule 7).*
6. *The last Premiss alone may be Negative (because the Conclusion which it produces is not used as a Minor Premiss).*

Summary.

In the Antecedent of a Sorites

Only the first Premiss may be Particular.

..... last Negative.

REDUCTION.

This name is given to *the process of changing any Simple Categorical Syllogism in Figures II, III (or IV), into an equivalent Syllogism in the First Figure.*

Except as an exercise it is useless, and belongs to an obsolete superstition that the First Figure is superior to the rest.

This is implied in the name REDUCTION or "bringing back." (Thus Hooker speaks of those who "reform a decayed estate by *reducing* it to the perfection from which it hath swerved.")

If a Syllogism in Fig. II or III is valid, nothing can be gained, though something may be lost, by torturing it into a Mood of the First Figure.

CHAPTER III.

OF HYPOTHETICAL SYLLOGISM.

HYPOTHETICAL SYLLOGISM is *that wherein one or more Propositions are hypothetical.*

HYPOTHETICAL PROPOSITION is *two, or more, Categorical Propositions welded into one by a Conjunction, or by Conjunctions.*

It is divided into

CONDITIONAL, *wherein two Categorical Propositions are connected by "If" placed before the first.*

DISJUNCTIVE, *wherein any number of Categorical Propositions are connected by "Or" placed between first and second, second and third, &c.*

Examples.

CONDITIONAL—"If A B committed the murder, A B deserves to be hanged."

DISJUNCTIVE—"A B is mad, or he is drunk, or he is a fool."

What is asserted in either form is the interdependence of the several Propositions.

Thus, in the first, it is not asserted that A B committed the murder, nor that he deserves hanging; but that, granting the first Proposition, the second will also be maintained.

Hence, the first is called ANTECEDENT,
 second CONSEQUENT.

In the second, that some one of the three is maintained.

(It is plain that the Disjunctive Proposition may easily be stated in the Conditional Form.

If A B is mad, he is neither drunk nor a fool.

If A B is not mad, he is either drunk or a fool, &c.

Hence it is only necessary to give Rules for)

CONDITIONAL SYLLOGISM.

That most in use is *that wherein the Major Premiss is Conditional, and Minor Premiss and Conclusion may be Disjunctive.*

It is divided on two principles,

a. ACCORDING TO THE NATURE OF THE MAJOR PREMISS.

(1) If this consists of *one* Conditional Proposition, the Syllogism is called SIMPLE.

(2) If of *more*, the Syllogism is called COMPLEX.

b. ACCORDING TO THE NATURE OF THE MINOR PREMISS.

(1) If this is *Affirmative*, the Syllogism is called CONSTRUCTIVE ;

(2) If *Negative*, DESTRUCTIVE.

We have thus—

Simple { Constructive.
 { Destructive.

Complex { Constructive.
 { Destructive.

THE RULES OF SIMPLE CONDITIONAL SYLLOGISM

Are derived from those of Simple Categorical Syllogism.

Every Universal Affirmative Proposition may be exhibited in the Conditional Form; thus,

“All good + happy” = “If A B + good, A B + happy.”

We will therefore make four simple Categorical Syllogisms with the Major Premiss, “All good + happy;” and bracket with it its equivalent Conditional.

If A B + good, A B + happy	}	(1)
bAr All good + happy		
bAr A B + good		
A A B + happy.		

If A B + good, A B + happy	}	(2)
A All good + happy		
A A B + happy		
A A B + good.		

If A B + good, A B + happy	}	(3)
cAm All good + happy		
Es A B - happy		
trEs A B - good.		

If A B + good, A B + happy	}	(4)
A All good + happy		
E A B - good		
E A B - happy.		

Examining these as Categorical Syllogisms, we find that

- (1) is correct in Barbara ;
- (3) Camestres ;
- (2) is faulty, being in Figure II without a negative
 Premiss ;
- (4) is faulty, being in Figure I with a negative Minor
 Premiss.

Then *taking them as Conditional Syllogisms*, we find that

- (1) is *Constructive* ; and that, the Minor Premiss
 having affirmed the Antecedent, the Con-
 clusion has affirmed the Consequent :
- (3) is *Destructive* ; and that, the Minor Premiss having
 denied the Consequent, the Conclusion has
 denied the Antecedent.

THE RULES THEREFORE OF CONDITIONAL SYLLOGISM ARE,

- 1. *If the Antecedent is affirmed, the Consequent
 must be affirmed.*
 - 2. *If the Consequent is denied, the Antecedent must
 be denied.*
- (2) in which the Consequent is affirmed, } are both
 (4) in which the Antecedent is denied, } *invalid.*

THE RULES OF COMPLEX CONDITIONAL SYLLOGISM.

The same Rules apply to Complex Conditional Syllogism, with this addition, that, whenever the Major Premiss has more than one Antecedent, or more than one Consequent, the affirmation or denial in the Minor Premiss and in the Conclusion must be Disjunctive.

1. If the Antecedent is affirmed (categorically or disjunctively), the Consequent must be affirmed (categorically or disjunctively).
2. If the Consequent is denied (categorically or disjunctively), the Antecedent must be denied (categorically or disjunctively).

We will next give two or three Examples of that kind of Complex Conditional Syllogism which is most often employed.

A (1).

Major	}	If this counsel + from above	It + irresistible.
Premiss		If this counsel + from man	It + sure to fail.

Disjunctive	}	(either, This counsel + from above,
Minor Prem.		)or, This counsel + from man.

Disjunctive	}	.∴ either, This counsel + irresistible,
Conclusion		) or, This counsel + sure to fail.

A (2).

Major Premiss { If this counsel + irresistible, } It + to be let
 { If this counsel + sure to fail, } alone.

Disjunctive { either, This counsel + irresistible,
 Minor Prem. { or, This counsel + sure to fail ;

Categorical Conclusion } ∴ This counsel + to be let alone.

B (1).

Major Premiss { If a Monarch + uncontrolled He + Tyrant.
 { If a Monarch + controlled He + Cypher.

Disjunctive { either, a Monarch + uncontrolled,
 Minor Prem. { or, a Monarch + controlled ;

Disjunctive Conclusion { ∴ either, He + Tyrant,
 { or, He + Cypher.

B (2).

Major Premiss { If a Monarch + Tyrant, Monarchy + dangerous.
 { If a Monarch + Cypher, Monarchy + useless.

Disjunctive { either, A Monarch + Tyrant,
 Minor Prem. { or, A Monarch + Cypher ;

Disjunctive Conclusion { ∴ either, Monarchy + Dangerous,
 { or, Monarchy + Useless.

B (3).

Major Premiss { If Monarchy + dangerous, } Monarchy + to be
 { If Monarchy + useless, } abolished.

Disjunctive Minor Prem. { either, Monarchy + dangerous,
 { or, Monarchy + useless ;

Categorical Conclusion } ∴ Monarchy + to be abolished.

C.

Major Premiss { If I + in training, I + unable to read.
 { If I - in training, I + unable to pull at Putney.

Disjunctive Minor Prem. { either, I + in training,
 { or, I - in training ;

Disjunctive Conclusion { ∴ either, I + unable to read,
 { or, I + unable to pull at Putney.

(1) In Syllogisms A (1), B (2) and (3), and in C,

The Major Premiss consists of *two* Conditional Propositions whereof each has a different Antecedent and a different Consequent ; and, the Minor Premiss disjunctively affirming the Antecedents, the Conclusion disjunctively affirms the Consequents.

Each is an Example of CONSTRUCTIVE DILEMMA.

Three points are to be noticed—

1. The Logical Validity.
2. The Material
3. The Rhetorical

1. *The Logical Validity* of these (as of any other) Syllogisms depends upon the observance of the Logical rules of inference: *i.e.* the Premisses being assumed *must* the Conclusion be admitted?

2. *The Material Validity* depends on the truth of the Minor Premiss; in other words, on the Minor Premiss really exhausting all possible alternatives; hence, the name DILEMMA (etymologically “double assumption,” or, possibly, “two choices”) is *sometimes extended to all complex conditional Syllogisms in which the Minor Premiss exhausts all alternatives*: but we popularly speak of the “horns” of a Dilemma.

In Syllogism A (1), and in C, the Minor Premiss is indisputable.

In Syllogism B (1), and (derivatively) in B (2), the Minor Premiss is disputable; for a Monarch need not be wholly controlled, or wholly uncontrolled.

The Rhetorical Validity consists in the equal unacceptableness, *to our opponent*, of the alternative conclusions.

In this view A (1), B (2), and B (3) are *rhetorically* valid.

But in C, the first alternative is unacceptable to the youth's Parent, Guardian, or Tutor; the second only to himself, or, possibly, to the Captain of the University Boat.

A (2) and B (3) are CONSTRUCTIVE COMPLEX CONDITIONAL SYLLOGISMS, wherein the Major Premiss consists of two Conditional Propositions, each having a different antecedent but a common consequent ; the advantage of this form being that the single consequent rests on two alternatives, one of which it has been shewn must be true.

(*Rhetorically*, however, neither of these Syllogisms would be expressed, because they blunt the edge of the Dilemmas.)

Of course any Complex Conditional Syllogism, and therefore any Dilemma, may be in the Destructive Form.

CHAPTER IV.

OF FALLACY.

A Fallacy is an Argument which affects to be valid, but is not,

- a. Either because some Logical Rule has been violated ;
- b. Or, Because a false Premiss has been assumed.

Beyond this it is not intended to classify or give names to Fallacies.

An example of each is subjoined.

A.—1. *Faulty Conversion.*

All clever men + eccentric. A

∴ All eccentric men + clever. A

Whereas all that is implied is that

Some eccentric men + clever. I

2. *Faulty Opposition.*

All testimony to miracles + to be accepted. A false.

∴ No testimony to miracles - to be accepted. E false.

Instead of

Some testimony to miracles - to be accepted. O true.

B.—*False Premiss.*

All who are red in the	}	+ drunk.
face, and breathe		
stertorously		
A B	+ red in the face, &c.	
∴ A B	+ drunk.	

(The Police Fallacy.)

The Major Premiss is not true.

It is grounded really upon the faulty Conversion of
 “All drunk + red in the face,” &c.

It was stated (on Page 2) that no other than the *present* Tense of the verb “TO BE” is admissible as Copula. The reason is that any variation amounts to introducing one other Term at least.

Thus (Whately)—

All civilised are whites.

The Gauls were whites.

∴ They were civilised.

Besides the fault involved in the non-distribution (by Rule 1 of Figure II) we have here five Terms instead of only three.

All who are civilised	+	whites.
The Gauls	+	people who were whites.
The Gauls	+	people who were civilised.

PART III.

CHAPTER I.

THE laws of Syllogism may be illustrated by the use of Symbols only; and wherever hitherto we have employed *significant* Terms it has been assumed that such Terms were unambiguous. In practice, however, this is not so. A wise reasoner will always insist that the Terms of the QUESTION shall be distinctly understood, before the discussion begins, by himself, and also (if so be) by the other party to the discussion.

But, even so, the MIDDLE TERMS subsequently introduced may be either in themselves ambiguous, or not understood in the same sense by both disputants.

It is essential to all right Reasoning that every Term employed shall be clearly *defined*: the ultimate purpose, therefore, now in view is to ascertain the LAWS OF LOGICAL DEFINITION.

OF PREDICABLES.

It was stated (Page 3) that the word PREDICATE is unavoidably ambiguous, and means either *the attribute Predicated*, or *the Term Predicated*.

Any Term predicated must be capable of being predicated, *i. e.* (a) PREDICABLE.

What then constitutes this PREDICABILITY ?

1. The power of CONNOTING (signifying the presence of) some Attribute, or aggregate of Attributes, in a Subject.
2. The power of DENOTING (being the common name of) any and every Subject in which such Attribute &c. exists, or is, by the person using the Term, supposed to exist.

Every PREDICABLE is said to be,
 in right of the first power, a CONCRETE } Term.
 second, a COMMON }

[The Student must here be reminded that by TERM is meant the verbal representative of (and practically the substitute for) an Idea, simple or complex ; whether such Idea be, in any given language, capable of being expressed by one or by more grammatical words. It is simply for convenience that, in illustration, such Ideas are chosen as can be expressed by one grammatical word : just as it is sometimes more convenient to use one coin, cheque, or note, instead of many coins of equal value.]

Thus Hard, Solid, Just, Dishonest, are

CONCRETE TERMS, because they signify the presence of the Attributes Hardness, Solidity, Justice, Dishonesty ;

COMMON TERMS, because they may be the common name of any and every Subject in which these Attributes respectively exist, or are supposed to exist.

Hardness, Solidity, Justice, Dishonesty, are named **ABSTRACT TERMS**, because they denote Attributes conceived of as existing apart from any Subject.

But how are the Ideas of these Attributes arrived at ?

By means first of our Senses, next of our Intellect, we perceive similar Quality, Attribute (or aggregate of these), in several instances ; this similarity we assume to be identity, and thus gain an Idea, which is thereafter *abstracted*, *i.e.* viewed independently of all other attendant circumstances in each instance.

Thus almost, probably quite, from the moment of birth an Infant receives an impression from contact with some substances wholly different from that which it receives by contact with others. It thus gradually gains the **ABSTRACT IDEAS** represented by the Abstract Terms—Hardness, Solidity, Sweetness, Softness.

When intellectual and moral perception awakes, the Child receives, through those media, by reflexion on some actions impressions wholly different from those received by reflexion on others. It thus gains gradually the **ABSTRACT IDEAS** represented by the **ABSTRACT TERMS**—Kindness, Crossness, Rightness, Wrongness.

The **ABSTRACT TERMS** are in each case exchanged (for convenience) for the **CONCRETE TERMS** which *connote*, instead of *denoting*, the Abstract Ideas.

The statements—

“Nurse is { cross,
unkind,
kind,
unjust,”

take the place of the statements—

{ “crossness
“unkindness
“kindness
“unjustness } exist in Nurse.”

And these CONCRETE TERMS are thenceforward ready to be applied to (*i.e. denote*, be the common name of, be predicated of) any substances or actions which, in the child's judgment, resemble those from which respectively the ABSTRACT IDEAS were gained.

(Those who have watched the ways of children will have noticed how apt they are to apply to every quadruped of a certain size the name, generally unintelligible, which they have once given to any one such quadruped.)

It cannot, of course, be *proved* that an infant or a child goes through any of these mental processes, since we all forget our first experiences in infancy and childhood.

But let any grown-up person try the experiment of finding a COMMON NAME which shall be applicable to (*i.e. Predicable of*) every thing upon a well-littered study-table, from which shall be supposed to be excluded all raw products and all forms of animal or vegetable life.

Consciously or unconsciously, he must go through the process of ABSTRACTION: which has been well defined, by

Aldrich, as "*the regarding in a number of individual objects ONLY their points of agreement.*"

Say that the point he fixes upon is "manufactured-ness."

He must at least have put out of view such differences as the following :

- a. Some belong to the animal kingdom, some to the mineral, some to the vegetable.
- b. The various uses for which each is made.

Next let an orange be placed on the table,
or his favorite kitten jump up on it,
or a spider drop on it.

If he is to frame a Term which shall be predicable of these new objects as well as of those which were there before he must repeat his ABSTRACTION ; *i.e.* he must discard more *differences*.

Or, let us take the quadrilateral plane rectilinear Figures defined in the first book of Euclid—

To give a common Name to *must be dropped*

- | | |
|--|---------------------------------|
| (1) Square and Rectangle . . | Equilateral-ness. |
| (2) Square and Rhombus . . | Right-angled-ness. |
| (3) Square, Rectangle, }
Rhombus, Rhomboid) . . | both Attributes
named above. |

Summary.

Every PREDICABLE TERM must be—

- A. *Concrete.*
- B. *Common.*

In the first capacity it is a grammatical device for superseding an awkwardness of Language. (See Page 3.)

In the second it has three functions ;

1. It *connotes*.
2. It is *capable of denoting*.
3. (As soon as predicated, but not before,)

It actually denotes any and every Subject of which it is predicated.

(Printed labels *connote* as soon as printed :

- can denote any and every vessel containing the substance connoted.
 do denote only those vessels to which they are actually attached.)

Since the ABSTRACT IDEA connoted by a PREDICABLE is gained only by discarding differences, it follows that

The more Attributes any Predicable connotes the fewer Individuals can it denote (and vice versa).

Thus—

SQUARE *connotes all that* RECTANGLE
 does + another Attribute.

RECTANGLE PARALLELOGRAM
 does +

PARALLELOGRAM PLANE QUADRILATERAL } does
 RECTILINEAL FIGURE }
 +

But

PLANE QUADRILATERAL } *can denote more Figures than*
 RECTILINEAL FIGURE } PARALLELOGRAM can.

PARALLELOGRAM RECTANGLE can.

RECTANGLE SQUARE can.

CHAPTER II.

CLASSIFICATION OF PREDICATED PREDICABLES.

PREDICATED PREDICABLES are classified according to the relation subsisting (or by the Predicator conceived to subsist) between

1. The ABSTRACT QUALITY (or Attribute) *connoted* by any Predicable, and
2. The SUBJECT of which it is actually predicated (*i.e.* which it actually *denotes*).

Thus "Cold" always connotes "Coldness."

But in the following Propositions,

Air + Cold,

Ice + Cold,

the relation of Coldness to Air is contingent,

..... Ice is necessary ;

consequently the Predicable "Cold," when Predicated in the one of these Propositions, will have a name different to that which it will have when Predicated in the other.

If the abstract quality, connoted by the Predicable, be (or by the Predicator be conceived to be) of the Subject denoted by it

The Predicable is named

- | | |
|---|-----------------|
| 1. The whole Essence | 1. Species. |
| 2. Part common
(of the whole Essence) | 2. Genus. |
| 3. Part distinctive
(of the whole Essence) | 3. Differentia. |
| 4. Joined (to the whole
Essence) necessarily | 4. Proprium. |
| 5. Joined (to any Individual in
whom the whole Essence
exists) contingently | 5. Accidens. |

NOTE.—By the word ESSENCE is meant the aggregate of those ideas which, in the view of the Predicator, make up the idea of the Subject.

Logic is the Judge, whose province is to lay down the law; not the Jury, whose province is to determine whether a particular set of facts fall under a particular law.

Therefore, in any illustrations which may be given in this part of the Treatise, I regard it as immaterial whether, as matters of fact, such illustrations are unimpeachable: that is a question which, if I may be allowed so to express my meaning, I do not allow to be raised.

Examples.

Suppose that I have before me any number of Plane Rectilinear Quadrilateral Figures, *agreeing* in that their opposite sides are parallel, *differing* in that some are rectangular and equilateral, some rectangular but not equilateral, some equilateral but not rectangular, some neither

equilateral nor rectangular; the greatest amount of agreement I can find by Abstraction (*i. e.* by discarding all differences) is *that they are, each and all, Plane Rectilineal Quadrilateral Figure, having the opposite sides parallel*: or, in one word, "Parallelogram-ness." I convert this Abstract Term into the Concrete "Parallelogram," which then becomes Predicable of each and all.

I proceed to Predicate it thus:—

All these Figures + Parallelogram.

The name of the Predicable in this Proposition is GENUS, because the Abstract Term connoted conveys to my apprehension all the ideas common to the differing Figures.

Suppose that I then make a selection and say,

All these Figures + Square,
 All those + Rectangle,
 All these + Rhombus,
 All those + Rhomboid,

the name of each of these Predicables will be SPECIES, because each connotes all the ideas which, to my apprehension, make up the idea of the Subject of which it has been predicated.

If I say,

This Rectangle + 6 inches long × 4 deep,
 This Square + 9 inches × 9

the name of the Predicables will be ACCIDENS, because the ideas connoted do not enter into my conception of the idea represented by Rectangle or Square.

If I say,

All Parallelograms + having opposite sides and angles equal,
 the name of the Predicable will be PROPRIUM, because the idea connoted by it is joined necessarily to that aggregate of ideas which make up my idea of the Subject of which it is predicated, but does not form one of that aggregate.

If I say,

All circles + { having a point within from which all lines drawn
to the circumference are equal,

the Predicable will be named DIFFERENTIA, because the idea connoted by it is that part of the idea of the Subject which distinguishes it from all other Plane Figures contained by one line.

NOTE.—Whether the name DIFFERENTIA or PROPRIUM shall be given to any Predicated Predicable, depends entirely on the conception formed by the Predicator of the relation between the quality connoted by the Predicable, and the idea he has formed of the Subject of which it is predicated.

Thus it has long been assumed that *Rationality* is a quality universally and exclusively forming the distinctive part of the Essence of Man.

In this view *Rational*, when Predicated of Man, will be named DIFFERENTIA.

Others may think that *Articulate-speech* is the distinctive part of the Essence of Man.

In this view *Articulately-speaking*, when Predicated of Man, will be named DIFFERENTIA; whereas, under the first supposition, it will be named PROPRIUM.

Since all Squares, Rectangles, Rhombi, Rhomboids are Parallelogram, it is plain that whatever may be predicated of Parallelogram may also be predicated of each of the other Figures.

This necessitates *subdivision of the first four Classes of Predicables given above*; viz. SPECIES, GENUS, DIFFERENTIA, and PROPRIUM.

To make this part of the Subject clear, we must make a set of COGNATE PREDICABLES, *i.e.* *Predicables connoting Abstract Ideas gained by analysing one Complex Idea.*

For this purpose it is advisable to adhere to the old established example.

Let us then take *any* individual Men, (say)

Nero, John Bunyan, Napoleon I.

Let it be assumed that

The whole Essence of these—"the whole that any *common* Term can express" (Whately)—is Humanity ;

	PART COMMON	+	PART DISTINCTIVE.
that Humanity is divisible into	Animality	+	Rationality,
.... Animality	Life	+	Sentience,
.... Life	Corporeity	+	Vital Principle,
.... Corporeity	Substance	+	Form,
.... Substance is indivisible.			

Let it be further assumed that to

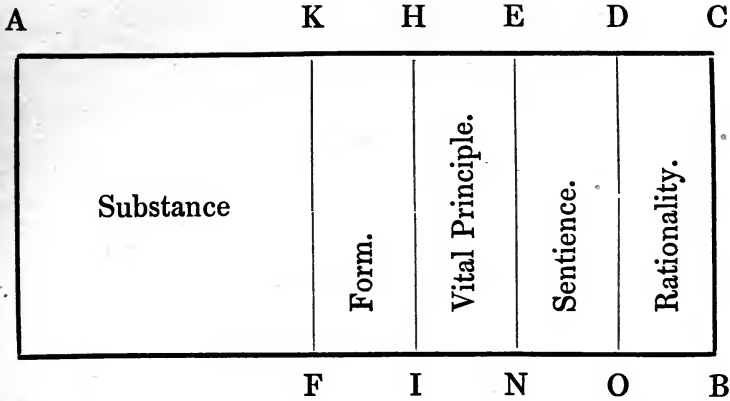
Humanity is necessarily joined	Power of Speech,
Animality	Spontaneous Motion,
Life	Requirement of Sustenance,
Corporeity	X. Y. Z.
Substance	Palpability ;

it is clear that in the one complex idea HUMANITY are involved, at least,

Rationality,
 Animality,
 Life,
 Sentience,
 Corporeity,
 Vital Principle,
 Substance,
 Form,
 Power of Speech,
 Spontaneous Motion,
 Requirement of Sustenance,
 X. Y. Z.
 Palpability ;

and that Predicables connoting each of these Abstracts may be Predicated of All Men,
 or, of Humanity.

The annexed Diagram illustrates this process of continued Abstraction.



Let

AB = Humanity, divided into AO = Animality and DB = Rationality.

AO = Animality, AN = Life EO = Sentience.

AN = Life, AI = Corporeity HN = Vital Principle.

AI = Corporeity, AF = Substance KI = Form.

AF = Substance (assumed to be) indivisible.

At each step, it will be seen, is dropped the *Part Distinctive*,
 left *Common* ;

the latter being again divided until is left an Idea (which we assume to be) incapable of further analysis.

The Ideas *joined necessarily* to AB, AO, AN, AI, AF may be conceived of as *welded externally* to each.

Of the Ideas *joined contingently* to Individuals who partake of AB &c. we take no account.

It will be convenient next to exhibit side by side

- (a) the results of this continued Abstraction; and
- (b) the Predicables which connote them.

Since it is assumed that

“Need of sustenance” is *necessarily joined* to the Essence of “Life;”

“Needing sustenance” will be called, when predicated of “all Living,” PROPRIUM (simply); when predicated of

“All Animal,” or
 “All Human,” } GENERIC PROPRIUM.

Again, “Vital Principle” being assumed to be *the Part Distinctive* of the Essence of “Life,” “Having Vital Principle” (*i.e.* “Animated”) will be called,

when predicated of “All Living,” SPECIFIC DIFFERENTIA ;

..... { “All Animal,” }
 { “All Human,” } } GENERIC DIFFERENTIA.

“Corporeity” being assumed to be *the Part Common* of the Essence of “Life,” “Corporeal” will be called, when predicated of “All Living,” GENUS (simply);

..... { “All Animal,” }
 { “All Human,” } } REMOTE GENUS.

AGAIN, since it is clear that

All Human	+	Animal,
All Animal	+	Living,
All Living	+	Corporeal,
All Corporeal	+	Substantial ;

those cognate Predicables which are alternately Predicates and Subjects are called GENERA when Predicated, SPECIES when they are Subjects ;

for Animality is the part common of the Essence of Humanity,
 Life Animality,
 Corporeity Life,
 Substance Corporeity.

That one Predicable which does not, and on our assumption cannot, become a Subject is called **GENUS SUMMUM**.

That which does not become a Predicate (but is Predicable of Individuals only) is called **SPECIES** simply (sometimes *Infima*).

TERMS REPRESENTING ABSTRACT IDEAS.

*Joined necessarily to
the whole Essence.*

*Part
Common.*

*Part
Distinctive.*

Palpability

\propto Substance

X. Y. Z.

\propto Corporeity = Substance + Form

Need of Sustenance

\propto Life = Corporeity + Vital Principle.

Spontaneous Motion


\propto Animality = Life + Sentience

Power of Speech

\propto Humanity = Animality + Rationality

⏟
Nero, John Bunyan, Napoleon I.

THE CONCRETE TERMS, *i.e.* PREDICABLES.*Propria.**Genera. Differentiæ.*

Palpable	\propto Substantial		
Having X. Y. Z.	\propto Corporeal	= Substantial + Formed.	
Needing Sustenance	\propto Living	= Corporeal + Animated.	
Spontaneously Moving	\propto Animal	= Living + Sentient.	
Having Power of Speech	\propto Human	= Animal + Rational.	
			
	Nero, John Bunyan, Napoleon I.		

Thus we obtain four additional classes.

If the Quality *connoted* by any
Predicable be (or be conceived
of as being) of the Subject
denoted by it,

The Predicable is named

1. Part of the Part Common
of the whole Essence, . . . 1. *Remote* GENUS.
2. Distinctive Part of Part
of the Part Common
of the whole Essence, . . . 2. *Generic* DIFFERENTIA.
3. Necessarily joined to Part
of the Part Common
of the whole Essence, . . . 3. *Generic* PROPRIUM.
4. Indivisible Part of the
Part Common of the
whole Essence, 4. *Summum* GENUS.

FOR EXAMPLE,

- (a) "Every Hexagon + having its interior angles equal to
twice as many right \angle s—4 as
it has sides,"—(*Generic* PRO-
PRIUM.)

The Quality here predicated belongs to a Hexagon, because
"Every Hexagon + Plane Rectilinear Figure;"
but it is necessarily joined to the whole Essence of Plane Rectilinear
Figure.

(b) "Every Square + having opposite sides Parallel,"—
 (Generic DIFFERENTIA,) because the Predicable is DIFFERENTIA when Predicated of Parallelogram, and Parallelogram is *Remote* GENUS when Predicated of Square.

(c) "Every Square + Plane Figure."—(*Remote* GENUS.)

(d) + Figure,"—(*Summum* GENUS.)

CHAPTER III.

OF LOGICAL DIVISION AND OF LOGICAL DEFINITION.

Both of these apply to TERMS: the need for either arises simply from the fact that Language is practically the only means whereby we can convey to one another (perhaps even to our own minds) Ideas.

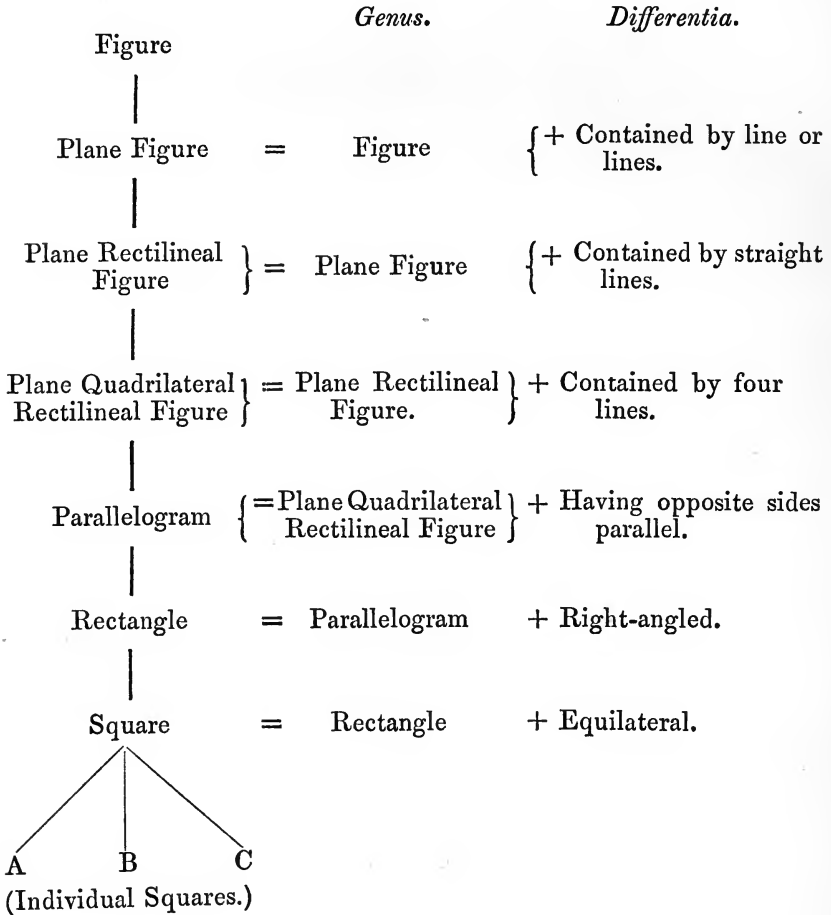
When a Term *denotes too widely* we must DIVIDE.

..... *connotes too much* DEFINE.

Thus, FIGURE denotes too widely, and must be Divided;

..... SQUARE connotes too much, and must be Defined.

Construct, from any number of Individual Squares, a table of COGNATE PREDICABLES (omitting Propria).



<i>By adding to</i>	<i>The Term</i>	<i>We Divide</i>	<i>into</i>	<i>constitute the Class</i>
Figure	Plane	Figure	Plane and not-Plane	Plane Figure.
Plane Figure	{ contained by straight } lines }	{ Plane Figure	Plane Figure contained by one line, and not contained by one line }	{ Plane Rectilineal Figure.
Plane Rectilineal Figure	{ Quadrilateral	Plane Rectilineal Figure	{ Quadrilateral and not Quad- rilateral }	{ Plane Rectilineal Quadrilateral Figure.
Plane Rectilineal Quad- rilateral Figure	{ having the opposite } { sides parallel }	{ Plane Rectilineal Quad- rilateral Figure	{ Parallelogram and not- Parallelogram }	{ Parallelogram.
Parallelogram	Right-Angled	Parallelogram	Rectangle and not-Rectangle	Rectangle.
Rectangle	Equilateral	Rectangle	Square and not-Square	Square.

[We do not attempt to divide Square because we could only do so by adding ACCIDENTS instead of, as in all preceding instances, DIFFERENTIA.]

But if, by the same process, we had constituted the Class HUMAN, custom (not Logic) would allow of our adding Accidents such as connote Nationality, Profession, Trade, &c. &c., and constituting such Classes as French, German, Lawyer, Soldier, Merchant.]

We should thus have *divided* FIGURE into the Classes underwritten :

Solid Figure.

Circle.

Ellipse.

Non-Quadrilateral Rectilineal.

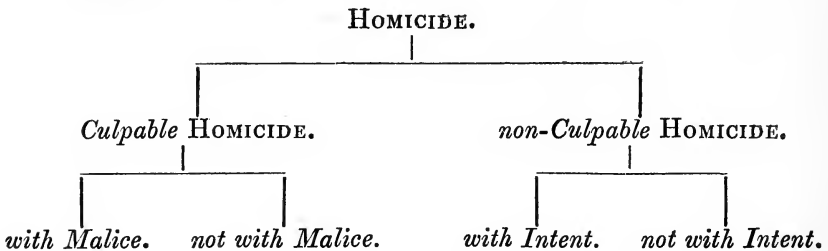
Trapezium.

Parallelogram, neither Rectangular nor Equilateral.

Rectangle.

Square.

Again,—



Here we have divided HOMICIDE into

Culpable with Malice = MURDER.

Culpable not with Malice . . . = MANSLAUGHTER.

Non-Culpable with Intent . . = JUSTIFIABLE.

Non-Culpable not with Intent . = HOMICIDE BY
MISADVENTURE.

THE RULES OF LOGICAL DIVISION are,

1. *The Term which has been divided must be Predicable, of each of the Classes into which it has been divided, as GENUS or REMOTE GENUS.*
2. *No one of these Classes must DENOTE more than the Term divided.*
3. *These Classes must, in the aggregate, DENOTE exactly as much as the Term divided.*
4. *No two of these Classes may be capable of being predicated of one and the same subject at the same time.*

Rule 1 distinguishes Logical Division from Physical.

Thus COLLEGE may be Logically divided into Naval, Military, Theological, &c.

a College, Physically, into Governing Body and Governed Body.

Rule 2 is so obvious that it is not easy to find a probable example of violation of it.

Rule 3 can always be complied with by dividing into such as connote the quality added, and such as do not.

(For instance, above, Plane Rectilinear Figure has been divided into Quadrilateral and non-Quadrilateral.)

Rule 4. The violation of this Rule is commonly called *Cross Division*.

I may, for instance, direct a Library to be divided, *i.e.* classified, according to the size, *or* the sub-

ject, or the language of each volume ; but it could not be arranged on two of these principles taken together. What could be done with a folio copy of a Greek Philosopher ?

So I may divide Plane Rectilinear Triangle—

1. According to the relations of the angles, or
2. the sides ;

but an equilateral triangle must be also an acute-angled triangle.

Similarly, to divide Plane-Rectilinear-Quadrilateral-Figure into Trapezium, Parallelogram, Rectangle, and Square, would be faulty ; because Parallelogram is GENUS when predicated of Rectangle and Square.

OF LOGICAL DEFINITION.

Every Logical Definition is

An Universal Affirmative Proposition in which Genus-and-Differentia is predicated of Species.

Thus—

“ All Murder + Culpable Homicide with Malice.”

“ All Square + Rectangle Equilateral.”

It is always Definition of a Term.

Thus—“ Murder ” having been adopted as a convenient name for “ culpable killing with malice ;”

“ Parallelogram ” as a convenient substitute for “ Figure Plane Rectilinear Quadrilateral, having the opposite sides parallel ;”

Any one with whom one is arguing may wish to have either of these Terms analysed.

If in place of either we had used the full description no Definition would have been required ; unless one of the Terms substituted should have required it, and that would only be because such Term admitted of analysis.

Thus it becomes a serious question in a trial for Murder, "What is Malice ?" and it is a question to answer which one must have particular knowledge of Legal Phraseology.

For the Law in certain cases assumes "Malice," (or at least it did some time back,)—

If A, at the time engaged in an unlawful act, slew B,
the Law found "Malice" for him ;

(but we must not travel into Law or Ethics.)

When the analysis of the Term is complete the Logical Definition is a self-evident truth ; because, as we have already seen,

SPECIES, *connoting* the whole Essence = Part Common + Part Distinctive of that whole Essence.

No Logical Definition can stand good unless the Proposition conveying it can be converted into an Universal Proposition. For example :

"All Human + Animal Rational."

"All Animal Rational + Human."

But an Universal Proposition can be similarly converted if the Predicate be $\left\{ \begin{array}{l} \text{DIFFERENTIA} \\ \text{PROPRIUM} \end{array} \right\}$ of the Subject (SPECIES).

"All Animal + Sentient." (DIFFERENTIA.)

"All Sentient + Animal."

And

“All Human + capable of Articulate Speech.”
(PROPRIUM.)

“All capable, &c. + Human.”

This is why, on Page 8, we said that it was (not true in fact but) assumed that no Affirmative Proposition distributes its Predicate ;

For it is from our knowledge extra-logical,
..... not logical ;

that we can ever convert A into A.

When required to define a Term, the Logician asks himself—

1. “What Idea does that Term (to my mind) *connote* ?”

2. (If that Idea is complex),

“Which is the *common* } part of it?”
..... *distinctive* }

This being ascertained, he exchanges his Abstract Terms for the Concrete, and states his Proposition.

For example :

He has stated, “Every Parallelogram has certain properties.”

He is required to define “Parallelogram.”

The Idea *connoted* being complex, he ascertains that it may be analysed into

1. The *common quality* of being Plane Rectilineal Quadrilateral Figure.

2. The *distinctive quality* of having the opposite sides Parallel.

He replies therefore,

“Every Parallelogram + Plane Rectilineal Quadrilateral Figure, having the opposite sides parallel.”

OF DEFINITION OTHER THAN LOGICAL.

By adding to DEFINITION the term *Logical* we of course imply that there is DEFINITION *non-Logical*. This is of three kinds—*Accidental, Physical, Nominal*.

OF ACCIDENTAL DEFINITION.

DEFINITION, etymologically, = “the laying down of boundaries.”

Boundaries prevent the confusion of one object with another: they do not necessarily help us to ascertain the real nature of any.

If a child ask, “*What is Gun-Cotton?*” the answer “Cotton, which does as well as Gun-Powder” is sufficient: for the child would thus be enabled to distinguish between Gun-Cotton and any substance he had yet known by the name of Cotton.

Accidental DEFINITION = “*An Universal Affirmative Proposition, in which Accidens, Proprium, Differentia* (or any combination of these) is predicated of the Subject.”

Again: it may be required to secure that some *individual Subject* shall not be mistaken for any other.

“*What is the Speaker of the House of Commons?*” is a question which must be answered by a *Logical* DEFINITION of the Office.

“*Which is the Speaker?*” asked by a Stranger present at the House, can only be answered by an *Accidental* DEFINITION.

“The Speaker is that gentleman in the long wig and the gown sitting under the canopy.”

“*Which is the Chairman of Committees?*”

“He is that gentleman who sits by himself in that seat in the middle of the House.”

OF PHYSICAL DEFINITION.

If an adult ask, “*What is Gun-Cotton?*” he will expect an accurate account of the mode of preparation and of the chemical qualities of Gun-Cotton.

“All Gun-Cotton is, &c. &c.”

OF NOMINAL DEFINITION.

If I have to send to a Library for a book, I *may* define it *accidentally* (and to an “*illiterate*” messenger I should do so).

“The book I want is the third, or the biggest, on such a shelf.”

To an intelligent messenger I should state the title, that is to say, I should give a *Nominal* DEFINITION.

It would not follow that the messenger, however intelligent, should have any idea of the contents of the book.

The book I want is “The Anatomy of Melancholy.”

..... “Bright’s Praxis.”

..... “Carpenter’s Physiology.”

..... “Sugden on Powers.”

If he could read I should get the book.

All Terms also admit of *Nominal* DEFINITION, and chiefly in three ways.

1. By simply substituting a word equivalent in meaning but better known, either generally or to the person requiring such Definition.

For instance,

(a) Mr. Verdant Green asked his mother to send him "two Ponies:" had she asked for a nominal Definition, she would not have sent the two Shetlands.

(b) "Many Birds this year?" a child might say, "Yes," if sparrows were abundant: a tenant-farmer or a country gentleman would know he was asked about partridges exclusively.

2. In many cases giving the Etymology of a word amounts to a *Nominal* Definition; for instance, *Astronomy—Geography — indurated — hypertrophous — synchronous — insoluble.*

In other cases this would be insufficient, or even misleading; for instance, *Geology—Telegraph—Desirable Premises.*

3. To supplement the two former methods we must often trace the history of a Term; for instance, *Whig—Tory—Puritan—Astrology—Pagan—Title* (for holy orders)—*Committee — Non-suit — Culprit — Automaton — Christian — Telegraph—Desirable Premises.*



APPENDIX.

REDUCTION.

On page 43 has been expressed an opinion that REDUCTION, except as an exercise, is useless. However, since, as an exercise, it is generally required of Students, it must not be omitted in a Manual designed for their use.

REDUCTION is of two kinds: OSTENSIVE (or direct), and AD IMPOSSIBLE (or indirect).

OSTENSIVE REDUCTION depends for its validity

1. On the fact that a PREMISS is equally assumed and granted whether it stand as MAJOR or as MINOR.
2. On the rules of CONVERSION.

ITS RULES are contained in the Memoria Technica given on page 29.

Observe, first, that only four INITIAL CONSONANTS are employed throughout, as in the first Figure, viz. B, C, D, F.

1. In any other Figure than the first these Consonants indicate *the mood of the first Figure to which the given Syllogism is to be REDUCED.*
2. The OTHER SIGNIFICANT CONSONANTS are *m* (for *mutandæ*), indicating that in the given Syllogism *the Premisses are to be transposed*; *s* and *p*, indicating that *the Propositions whose Symbols they immediately follow are to be converted.*

For example,

Suppose it be required to REDUCE Syllogisms in the moods

(1) CAmEstrEs, (2) DIIsAmIs, (3) FELAptOn.

The moods of the first Figure will be

in (1) CEIArEnt,

(2) DArII,

(3) FErIO;

in (1) and (2) the Premisses must be transposed.

Conversion must be applied

in (1) to the Minor Premiss, before transposition, and to the Conclusion.

(2) to the Major Premiss, before transposition, and to the Conclusion.

(3) the only thing required is to convert the Minor Premiss.

(1)

CAm	All	morally-responsible	+	rational.
Estr	No	Brute	—	rational.
Es	No	Brute	—	morally-responsible.

to

CEI	No	rational	—	Brute.
Ar	All	morally-responsible	+	rational.
Ent	No	morally-responsible	—	Brute.

(2)

DIIs	Some	War	+	justifiable.
Am	All	War	+	calamitous.
Is	Some	calamitous	+	justifiable.

to

DAr	All	War	+	calamitous.
I	Some	justifiable	+	War.
I	Some	justifiable	+	calamitous.

			(3)						
FEl	No	idiots		—	morally-responsible.				
Apt	All	idiots		+	human.				
On	Some	human		—	morally-responsible.				
						<i>to</i>			
FEr	No	idiots		—	morally-responsible.				
I	Some	human		+	idiots.				
O	Some	human		—	morally-responsible.				

In order to get rid of REDUCTION indirect have been substituted in the Memoria Technica for BArOKO ... FAkOrO (1)
 BOkArdO ... DOkAmO (2)

The *m* indicates as before.

The *k* indicates that the form of the Premiss whose symbol it immediately follows is to be changed, and the changed Premiss converted. For example:

{	A	All honest	+	expedient.	{	O	Some glittering	—	gold.
{	E	No not-honest	—	expedient.	{	I	Some glittering	+	not-gold.
	E	No expedient	—	not-honest.		I	Some not-gold	+	glittering.

(1)

FAk	All	honest		+	just.				
Or	Some	enforcement of strict legal right		—	just.				
O	Some	.....		—	honest.				

to

FEr	No	not-just		—	honest.				
I	Some	enforcement, &c.		+	not-just.				
O	Some	.....		—	honest.				

(2)

DOk	Some	Athletic exercises		—	beneficial to health.				
Am	All	.....		+	intended to be beneficial to health.				
O	Some	intended to be beneficial to health		—		beneficial to health.			

	<i>to</i>	
DAr	All Athletic exercises	+ { intended to be beneficial to health.
I	Some not beneficial to health	+ Athletic exercises.
I	Some	+ { intended to be beneficial to health.

II. REDUCTION AD IMPOSSIBLE (indirect) is applied to the Moods BArOkO and BOkArdO, the *k* here indicating that *in place of the Premiss whose symbol it immediately follows is to be assumed the Contradictory of the conclusion of the Syllogism to be reduced.*

It is best understood by an example.

BOK	Some studies	— useful.
Ard	All studies	+ intended to be useful.
O	Some intended to be useful	— useful.

to

b Ar	All intended to be useful	+ useful.
b Ar	All studies	+ intended to be useful.
A	All studies	+ useful.

But the new Conclusion is the Contradictory of the former Major Premiss, which is assumed to be true ;

∴ the new Conclusion is false.

∴ { either the reasoning is faulty,
or a false Premiss has been assumed.

The reasoning is not faulty, (but correct in BArbArA ;)

∴ a false Premiss has been assumed :

but not the Minor, which has been assumed to be true ;

∴ the Major.

∴ the old Conclusion (its Contradictory) is true.

OF INDUCTION AND EXAMPLE.

ALDRICH included both under ABBREVIATED SYLLOGISM.

It is useful to exhibit each in CATEGORICAL SYLLOGISM, in order to show that, in each, the Syllogism which exhibits either breaks the law of Categorical Syllogism, or assumes a Premiss which is *literally* false, (though it may be *practically* true.)

INDUCTION.

“A. B. C. (specimens of Magnet) attract iron,
∴ All magnets attract iron.”

This may be exhibited in two forms of Categorical Syllogism.

(1)

A	A. B. C.	+	attractive of iron.
A	A. B. C.	+	magnets.
A	All magnets	+	attractive of iron.

In this case the Minor Term, undistributed as Predicate of an affirmative Premiss is distributed as Subject of an Universal Conclusion; i.e. there is *illicit process of the MINOR TERM*.

(2)

bAr	A. B. C.	+	attractive of iron.
bAr	All magnets	+	A. B. C.
A ∴	.....	+	attractive of iron.

In this case the Minor Premiss is *literally* false: it assumes that which it is the (distinct) office of Inductive Reasoning to prove, viz. that the specimens are adequate representatives of the whole class called by the name “Magnet.”

Example.

EXAMPLE is either identical with Induction (in form), or a Deductive Categorical Syllogism whose Major Premiss is supplied by Induction.

(I take again ALDRICH's instance).

“Cæsar and Pompey will tear the Country to pieces, for so did Sylla and Marius.”

bAr	Sylla and Marius	+	tearers of the Country to pieces.
bAr	Cæsar and Pompey	+	Sylla and Marius, (<i>literally</i> false.)
A	Cæsar and Pompey	+	tearers of the Country to pieces.

(or)

bAr	All of the character of } Sylla and Marius	+	tearers of the Country to pieces.
bAr	Cæsar and Pompey	+	of the character of Sylla and Marius.
A	Cæsar and Pompey	+	tearers of the Country to pieces.

The real difference between Induction and Example is in the matter with which they deal.

It is impossible to establish Uniformity of Law in respect to human conduct.

It is asserted to be possible in respect to physical facts.

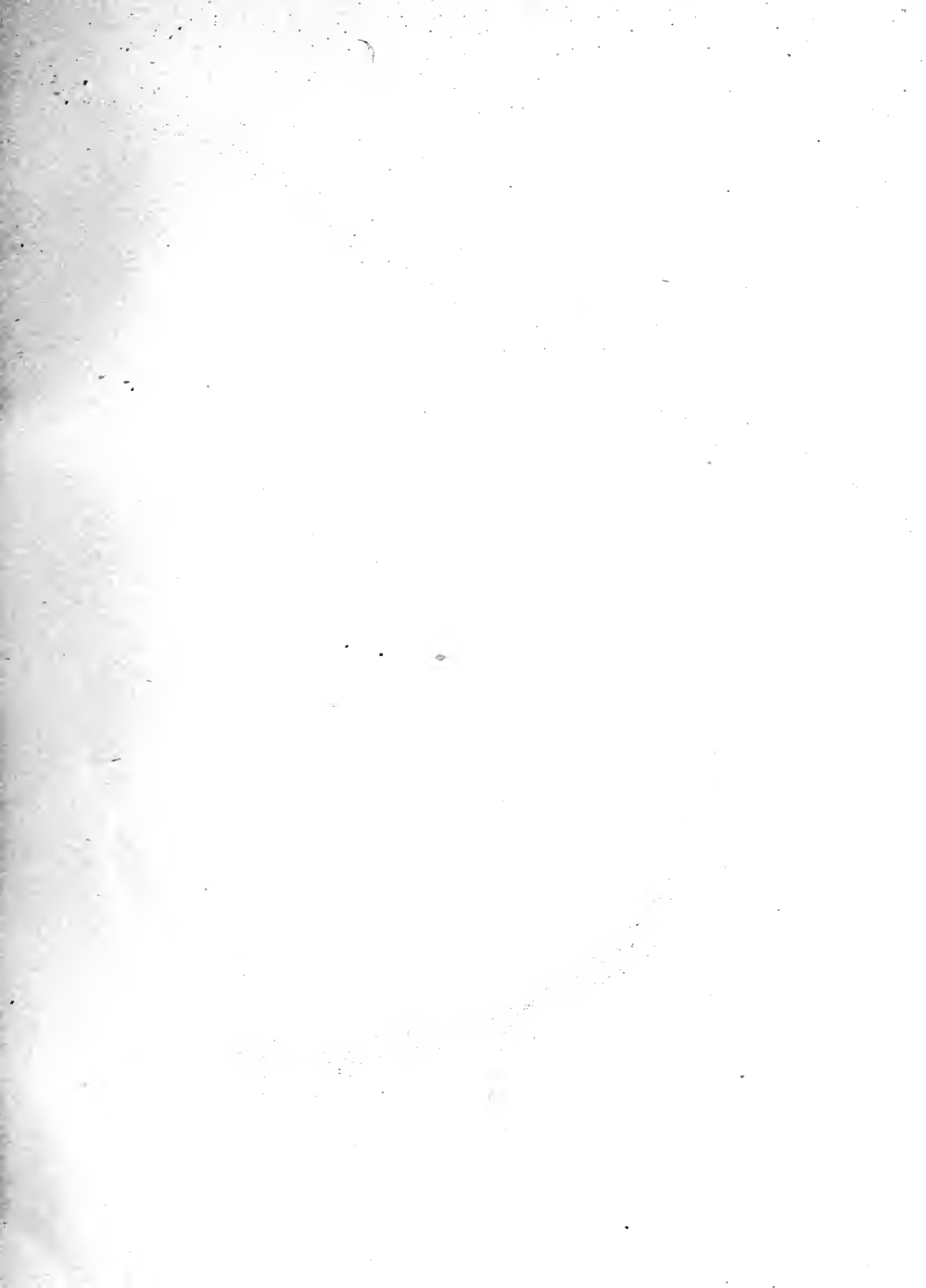
Hence the sphere of Induction is Science, and its office is to convince.

The sphere of Example is Contingent matter, and its office is to persuade.

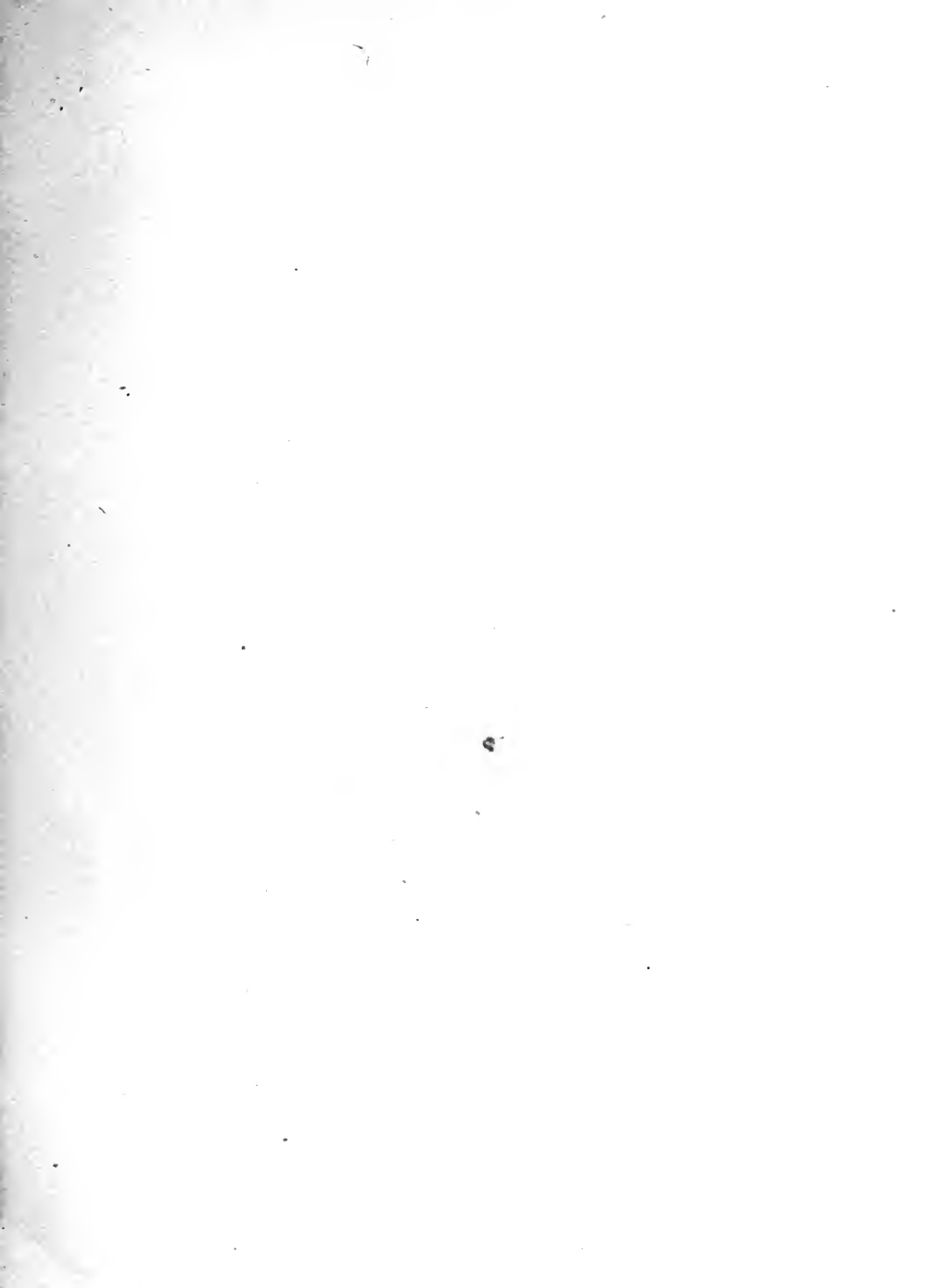
I subjoin a recent instance of reasoning by Example.

It has been said, that "the further Russia pushes her Empire towards India the weaker she must become"; and we are referred by way of Example to the Crimean War, the result of which is supposed to have established that "the farther from the base of operations Military operations are carried, the more exhausting they are." Admit this as proved by the Example quoted, and the conclusion logically follows.

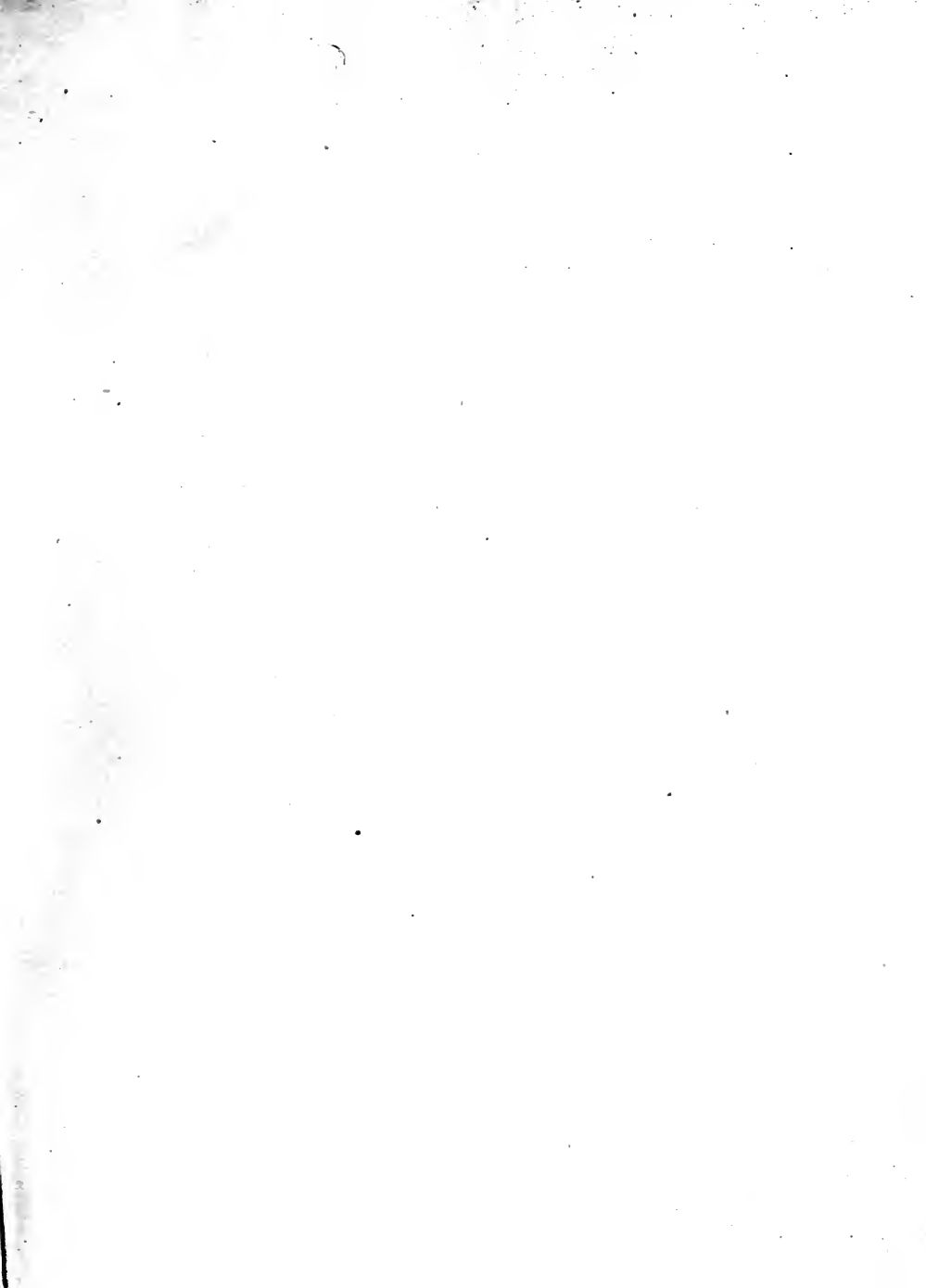
THE END.











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