A COMPENDIUM OF LOGIC.

BOOK I.

CHAPTER I.

OF SIMPLE TERMS.

SECTION I.

THE operations of the mind are three, 1. Simple Apprehension : 2. Judgment : 3. Discourse. *a, Process*

1. Simple Apprehension is, the bare conceiving a thing in the mind.

2. Judgment is, the mind's determining in itself, that the things it conceives agree or disagree.

3. Discourse is, the progress of the mind from one judgment to another.

But our apprehension is apt to be indistinct, our judgment false, our discourse inconclusive. To prevent this, wise men prescribed several rules, which were at length collected into one body, and termed *Logic,* or the Art of Reasoning.

SECTION II.

BUT we cannot express to another what passes in our own mind, any otherwise than by words : It is therefore by teaching us the proper use of words, that logic assists the mind, 1. To apprehend distinctly : 2. To judge truly : 3. To discourse conclusively.

A word that expresses simple apprehension is called a simple word; one that expresses judgment, a complex, or compounded word; one that expresses discourse, a decomplex, or twice compounded one : For every argument is

VOL. XIV. **M**

Logic: That collection of investigation & rules & principles that deal with the Art of Reasoning.

resolvable into three propositions, or sentences; and every proposition contains three words, (in sense, if not in number,) 1. The subject, or that of which something else is said: 2. The predicate, or that which is said: And, 3. The copulative, that stands between the subject and predicate; which are therefore called the terms of the proposition.

SECTION III.

THE first part of logic treats of simple terms, that is, of such words as may by themselves be the subject or predicate of a proposition.   Of these there are several divisions; as,—

1. A singular word, which expresses one thing only; as, Socrates: A common, which expresses many and each of them; as, a man.

2. An infinite word, to which the particle " not " is prefixed; as, not-a-man, which may imply anything besides: A finite, to which that particle is not prefixed.

3. A positive word, which expresses a thing as present: A privative, which expresses its absence from a subject capable of it: A negative, which expresses its absence from a subject not capable of it.   So, seeing, spoken of a man, is a positive word; blind, spoken of a man, is a privative; spoken of a stone, a negative word.

4. An univocal word, whose one signification equally agrees to several things; as, a man: An equivocal, whose different significations agree equally; as, a foot: An analogous, whose one signification agrees unequally; as, knowledge, applied to God and man.

5. An absolute word, which expresses a thing considered as by itself; as, justice: A connotative, which expresses the same thing as joined to another; as, just.

An absolute word, expressing a thing as separate from its subject, is also called an abstract; as, justice: And a connotative, expressing it as joined to a subject, a concrete word; as, just.

Those connotative words which imply each other are termed relatives; as, a father, and, a son.

6. Consistent words, which may at the same time be affirmed of the same thing; as, cold, and, dry: Opposite, which cannot; as, black, and, white.

The opposition of simple terms is fourfold: 1. Relative, between relative terms; as, a father, and, a son: 2. Con-

trary, between contrary terms, that is, absolute words, which expel one another from a subject capable of either; as, black, and, white: 3. Privative, between a privative and a positive word; as, seeing, and, blind: 4. Contradictory, between a positive and a negative word; as, a man, and, not-a-man. This is the greatest of all oppositions, as admitting of no medium; neither a medium of participation, such as is grey, between black and white; nor a medium of abnegation, such as is a stone, between seeing and blind. Relative opposition, on the other hand, is the least of all: For relative terms are not opposites, unless they are considered with respect to the same thing.

<center>SECTION IV.</center>

AN univocal word is otherwise called a predicable, or a word capable of being predicated, that is, spoken in the same sense of several things.

There are five sorts of predicable words: 1. A genus, which is predicated of several things, as the common part of their essence; as, an animal: 2. A difference, which is predicated of several things as the distinguishing part of their essence; as, rational: 3. A species, which is predicated of several things as their whole essence; as, a man: 4. A property, which is predicated of several things as necessarily joined to their essence; as, risible: 5. An accident, which is predicated of several things as accidentally joined to their essence; as, tall, short.

<center>SECTION V.</center>

A GENUS is either the highest or a subaltern: A species is either a subaltern or the lowest. The highest genus is that which never is a species; the lowest species, that which never is a genus. A subaltern genus, or species, is a genus when predicated of a lower species; as, Every man is an animal: A species when subjected to an higher genus; as, Every animal is a substance.

Wherefore, a difference is either generical, which, added to the genus, constitutes a subaltern species; as, sensible: Or specific, which constitutes the lowest species; as, rational.

A property likewise is either generical, which is necessarily joined to the essence of an highest or subaltern genus; as,

<center>M 2</center>

movable: Or specific, which is joined to that of a lowest species; as, risible.

But a property is vulgarly said to be fourfold: 1. Such as belongs to one species only, but not to every individual of it; as, to be a grammarian: 2. Such as belongs to every individual of a species, but not of that species only; as, to have two feet: 3. Such as belongs to one species and every individual, but not always; as, to turn grey-haired: 4. Such as belongs to every individual of one species only, and that always; as, risibility. It is such a property as this which constitutes the fourth predicable.

SECTION VI.

To divide a common word is, to enumerate its several significations. So he is said to divide the word *animal,* who says, " It signifies either a man or a brute."

Division is therefore a distinct enumeration of the several things which are signified by a common word.

The rules of division are three :—

1. Let the members of the division severally contain less (be of a narrower signification) than the word divided: 2. Let them conjointly contain neither more nor less than the divided: 3. Let them be opposite, that is, not contained in each other.

SECTION VII.

DEFINITION follows division: It is, a sentence explaining the word defined; and is either nominal, which tells the derivation of the word; or real, which explains the nature of the thing. Again: A real definition is either accidental, which assigns the properties or accidents of the defined; or essential, which assigns those parts that constitute the essence of it. Lastly: An essential definition is either logical, which assigns the genus and difference; or physical, which assigns the really distinct parts of its essence; for the genus and difference are only distinguished by the understanding.

For example: *Homo* is defined nominally, *qui ex humo;* accidentally, a two-legged unfeathered animal; logically, a rational animal; physically, a being consisting of an organized body, and a reasonable soul.

The rules of definition are three: 1. Let the definition be adequate to the defined: 2. Let it be clearer and plainer than

the defined : 3. Let it be contained in a fit number of proper (not figurative) words.

CHAPTER II.

OF PROPOSITIONS.

SECTION I.

THE second part of logic treats of propositions, which is judgment expressed in words.

A regular proposition is, an affirmative or negative sentence, signifying either true or false : Not ambiguous ; for then it would be sentences : Nor maimed ; for then it would have no signification.

It is either categorical, which pronounces a thing absolutely ; as, Plato is happy : Or hypothetical, which pronounces conditionally ; as, If he is wise, then he is happy.

Again : A proposition is either affirmative or negative ; and is either true or false. This is called the quality of it.

Lastly : It is either universal ; as, All men are animals : Or particular ; as, Some men are learned. This is called the quantity of it.

SECTION II.

A is put for an universal affirmative proposition ; E, for an universal negative ; I, for a particular affirmative ; O, for a particular negative.

In an universal affirmative, the subject only is distributed : (That is, taken in its full sense :) In a particular negative, only the predicate : In a particular affirmative, neither term is distributed : In an universal negative, both.
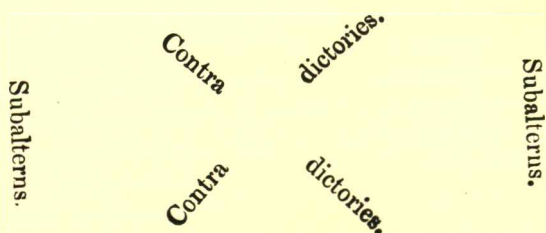
The matter of a proposition (that is, the manner wherein the terms cohere) is either, 1. Necessary, when they essentially agree ; or, 2. Impossible, when they essentially differ ; or, 3. Contingent, when they agree or differ accidentally.

SECTION III.

THOSE propositions are said to be opposed, which, having the same subjects and predicates, yet differ either in quantity, or in quality, or both.

The whole doctrine of opposition is contained in this scheme :—

<table>
<tr><td>n. t.
i. f. A
c. f.</td><td>Contraries.</td><td>n. f.
E i. t.
c. f.</td></tr>
</table>

Subalterns.   *Contra* *dictories.*   Subalterns.

Contra *dictories.*

<table>
<tr><td>n. t.
i. f. I
c. t.</td><td>Subcontraries.</td><td>n. f.
O i. t.
c. t.</td></tr>
</table>

Here A. E. I. O. are four propositions, marked according to their quantity and quality, which are, t. f., true or false, as the matter of the proposition is n. i. c., necessary, impossible, or contingent. Hence it is easy, 1. To enumerate the species of opposition, which are contradictory, contrary, subcontrary, and subaltern. 2. To define each. For example : Contradictory opposition is that which is between two categorical propositions, differing both in quantity and quality, &c. 3. To lay down the rules of opposites, as follow :—

(1.) Contradictory propositions are never both true, or both false; but always one true, the other false.

But observe : Four things are required to make a contradiction ; namely, to speak of the same thing, (i.) In the same sense : (ii.) In the same respect : (iii.) With regard to the same third thing : And, (iv.) At the same time. If any of these conditions be wanting, is, and, is not, may agree. For

instance: (i.) An opinion is and is not faith. It is dead faith; it is not living faith. (ii.) Zoilus is and is not red-haired. He is, with respect to his head; he is not, with respect to his beard. (iii.) Socrates is and is not long-haired. He is, in comparison of Scipio; he is not, in comparison of Xenophon. (iv.) Solomon is and is not a good man. He is, in his youth; he is not, in his middle age.

(2.) Contrary propositions are never both true: But in the contingent matter they are both false.

(3.) Subcontraries are never both false: But in the contingent matter they are both true.

(4.) Subalterns are sometimes both true, sometimes both false; sometimes one true, the other false.

<div align="center">SECTION IV.</div>

A PROPOSITION is said to be converted when its terms are transposed. This is done either, 1. Simply, when neither the quantity nor quality; or, 2. Accidentally, when the quantity is changed.

An universal negative, or a particular affirmative, may be simply converted, and the inference will hold. An universal affirmative must be converted accidentally, or the inference will not hold.

<div align="center">CHAPTER III.</div>

<div align="center">OF SYLLOGISMS.</div>

<div align="center">SECTION I.</div>

THE third part of logic treats of syllogism, which is a discourse expressed in propositions.

A syllogism is commonly defined, a sentence in which something being premised, something else necessarily follows from it.

A categorical syllogism consists of three categorical propositions; the two former of which are termed, the antecedent; the third, the consequent; which before it is proved is called a problem or question, afterwards, a conclusion.

We must make use of some third term, in order to find whether the subject and predicate of a question agree: and

that, because of the following rules, on which the whole force of syllogism is founded :—

1. Those terms which agree with one and the same third agree with one another.

2. Those terms, one of which agrees, the other disagrees, with one and the same third, differ from one another.

3. Those which do not agree with one and the same third do not agree with one another.

SECTION II.

FROM these general principles the particular rules of syllogism are thus reduced :—

1. In every syllogism there are three, and only three, terms; two in the conclusion; and these can neither be proved to agree nor to differ, without one, and only one, third term.

The predicate of the question is styled the major term; the subject, the minor; the third term, the medium or middle term. For the predicate is commonly more comprehensive than the medium, as the medium is than the minor.

2. In every syllogism there are three, and only three, propositions; two premisses, in which the medium is compared with the two other terms severally; (the major proposition, in which it is compared with the major term; the minor proposition, in which it is compared with the minor term;) and the conclusion, in which both those terms stand together.

3. An equivocal medium proves nothing. For this is not one and the same third.

4. An undistributed medium is equivocal; therefore,

5. The medium must be distributed in one of the premisses.

6. The process from a term not distributed in the premiss to the same distributed in the conclusion, is irregular.

7. Negative premisses prove nothing; for in this case a third is brought, from which both the terms differ.

8. If either of the premisses is negative, so is also the conclusion.

9. And, if the conclusion be negative, so is also one of the premisses.

10. Particular premisses prove nothing.

11. If either of the premisses be particular, so is also the conclusion.

SECTION III.

It remains to inquire, how many ways three categorical propositions can be joined together, so as to compose a regular syllogism. In which inquiry, two things are to be considered :—

1. The mood, or the variation of the propositions according to their quantity and quality :

2. The figure, or the manner of comparing the medium with the terms of the conclusion.

There are sixty-four moods : For the major of a syllogism may be either A, E, I, or O. To each of these a fourfold minor may be annexed, whence arise sixteen pair of premisses; and to each of these sixteen, a fourfold conclusion may be subjoined, thus :—

AAA.	AAE.	AAI.	AAO :	AEA.	AEE.	AEI.	AEO :
AIA.	AIE.	AII.	AIO :	AOA.	AOE.	AOI.	AOO :
EAA.	EAE.	EAI.	EAO :	EEA.	EEE.	EEI.	EEO :
EIA.	EIE.	EII.	EIO :	EOA.	EOE.	EOI.	EOO :
IAA.	IAE.	IAI.	IAO :	IEA.	IEE.	IEI.	IEO :
IIA.	IIE.	III.	IIO :	IOA.	IOE.	IOI.	IOO :
OAA.	OAE.	OAI.	OAO :	OEA.	OEE.	OEI.	OEO :
OIA.	OIE.	OII.	OIO :	OOA.	OOE.	OOI.	OOO.

But sixteen of these are excluded by the seventh rule, because their premisses are negative; viz., EEA. EEE. EEI. EEO : EOA. EOE. EOI. EOO : OEA. OEE. OEI. OEO : OOA. OOE. OOI. OOO : Twelve, by the tenth rule, because their premisses are particular; viz., IIA. IIE. III. IIO : IOA. IOE. IOI. IOO : OIA. OIE. OII. OIO : Twelve, by the eighth rule, because one of the premisses is negative, and not the conclusion : AEA. AEI : AOA. AOI : EAA. EAI : EIA. EII : IEA. IEI : OAA. OAI : Eight, by the eleventh rule, because one of the premisses is particular, and not the conclusion : AIA. AIE : AOE : EIE : IAA. IAE : IEE. OAE : Lastly : Four, by the ninth rule, because the conclusion is negative, but neither of the premisses : AAE. AAO : AIO : IAO.

Therefore, fifty-two moods are excluded, many of which offend against several rules. There remain twelve, which only are useful in syllogism : AAA. AAI : AEE. AEO : AII : AOO : EAE. EAO : EIO : IAI : IEO : OAO.

SECTION IV.

THE figures of syllogism are four: For the medium is either subjected to the major, and predicated of the minor, term, which is the First figure; or predicated of both, which is the Second; or subjected to both, which is the Third; or predicated of the major, and subjected to the minor, which is the Fourth; as appears in the following scheme, wherein A is the major term, B the medium, C the minor:—

First Fig.	Second Fig.	Third Fig.	Fourth Fig.
B. A.	A. B.	B. A.	A. B.
C. B.	C. B.	B. C.	B. C.
C. A.	C. A.	C. A.	C. A.

Wherefore, of the twelve remaining moods, each figure excludes six; namely,

1. Because of the undistributed medium, the first, two, IAI: OAO; the second, four, AAA. AAI: AII: IAI; the fourth, two, AII: AOO.

2. Because of the irregular process of the major term, the First figure excludes four moods, AEE. AEO: AOO: IEO; the Second, two, IEO: OAO; the Third, four, AEE: AEO: AOO: IEO; the Fourth, two, IEO: OAO.

3. Because of the irregular process of the minor term, the Third, two, AAA: EAE; the Fourth, two, AAA: EAE.

There remain twenty-four conclusive moods, six in each figure:—

THE FIRST FIGURE.

bAr   Every wicked man is miserable :
bA   Every tyrant is a wicked man: Therefore,
rA   Every tyrant is miserable.

cE   No discontented man is a happy man:
IA   Every wicked man is discontented : Therefore,
rEnt   No wicked man is a happy man.

dA   All the faithful are dear to God:
rI   Some that are afflicted are faithful : Therefore,
I   Some that are afflicted are dear to God.

fE   No virtue is an evil:
rI   Some difficult things are virtues: Therefore,
O   Some difficult things are not evils.

A   Every wicked man is miserable :
A   All tyrants are wicked men : Therefore,
I   Some tyrants are miserable.

E   No discontented man is a happy man :
A   Every wicked man is discontented : Therefore,
O   Some wicked men are not happy men.

THE SECOND FIGURE.

cEs   No happy man is discontented :
A   Every wicked man is discontented : Therefore,
rE   No wicked man is a happy man.

cAm   Every wicked man is discontented :
Es   No happy man is discontented : Therefore,
trEs   No happy man is a wicked man.

f Es   No evil is a virtue :
tI   Some difficult things are virtues : Therefore,
nO   Some difficult things are not evils.

bAr   Every good man is afflicted :
Ok   Some rich men are not afflicted : Therefore,
O   Some rich men are not good men.

E   No happy man is discontented :
A   Every wicked man is discontented : Therefore,
O   Some wicked men are not happy men.

A   Every wicked man is discontented :
E   No happy men are discontented : Therefore,
O   Some happy men are not wicked men.

THE THIRD FIGURE.

dAr   All the faithful are dear to God :
Ap   All the faithful are afflicted : Therefore,
tI   Some that are afflicted are dear to God.

dIs   Some faithful are afflicted :
Am   All the faithful are dear to God : Therefore,
Is   Some that are dear to God are afflicted.

dAt   All the faithful are dear to God :
Is   Some of the faithful are afflicted : Therefore,
I   Some that are afflicted are dear to God

f El   No virtue is an evil:
Ap   All virtues are difficult: Therefore,
tOn   Some difficult things are not evils.

bOk   Some Christians are not true believers:
Ar   All Christians profess faith: Therefore,
dO   Some who profess faith are not true believers.

f Er   No virtue is an evil:
Is   Some virtues are difficult: Therefore,
On   Some difficult things are not evils.

THE FOURTH FIGURE.

brAm   Every tyrant is a wicked man:
An   Every wicked man is miserable: Therefore,
tIp   Some that are miserable are tyrants.

cAm   Every wicked man is discontented:
En   No discontented man is a happy man: Therefore,
Es   No happy man is a wicked man.

dIm   Some afflicted are faithful:
Ar   All the faithful are dear to God: Therefore,
Is   Some that are beloved of God are afflicted.

f Es   No evil is a virtue:
Ap   All virtues are difficult: Therefore,
O   Some difficult things are not evils.

frEs   No evil is a virtue:
Is   Some virtues are difficult: Therefore,
On   Some difficult things are not evils.

A   Every wicked man is discontented:
E   No discontented man is a happy man: Therefore,
O   Some happy men are not wicked men.

SECTION V.

THE four first of these moods need nothing to make the force of the inference evident, but what is expressed in the premisses; whereas all the rest do. These, therefore, are styled perfect, those imperfect, moods.

An imperfect mood is said to be reduced, when it is changed into a perfect one; in order to show evidently, either that the conclusion is so, which is termed ostensive reduction; or, that it cannot be otherwise, which is called reduction *ad impossibile.*

The method of reducing is taught by the names of the moods ; in which the vowels are the propositions marked with their quantity and quality : The initial consonants, b, c, d, f, show to what mood in the first figure the reduction is to be made; s, p, show that the proposition which the preceding vowel stands for is to be converted either simply or *per accidens;* m, that the premisses are to be transposed; k, that the reduction is to be *ad impossibile ;* that is, that for the premiss to whose sign it adheres, the contradictory of the conclusion is to be placed; which being done, you will have, in the first figure, a conclusion, either the same with that premiss, or one convertible into it, or its contradictory.   Thus :—

1. cEs   No happy man is discontented :
   Ar   Every wicked man is discontented : Therefore,
   E   No wicked man is a happy man.
                    Reduce this to
   cE   No discontented man is a happy man :
   lA   Every wicked man is discontented : Therefore,
   rEnt No wicked man is a happy man.

2. dIs   Some good men are Papists :
   Am   Every good man is saved : Therefore,
   Is   Some that are saved are Papists.
                    Reduce this to
   dA   Every good man is saved :
   rI   Some Papists are good men : Therefore,
   I   Some Papists are saved.

3. bAr   Every good man is afflicted :
   Ok   Some rich men are not afflicted : Therefore,
   O   Some rich men are not good men.
                    Reduce this to
   bAr   Every good man is afflicted :
   bAr   Every rich man is a good man——
   A

The manifest falsehood of which proves as manifestly the truth of its contradictory.

From what has been said, it is evident, that there can be no more moods than these twenty-four.   They are therefore mistaken, who, having transposed the premisses, or converted the conclusion of a syllogism, imagine they have found out a

new mood or figure : To convince them of which, you need
only to refer to the definition of a mood, a figure, of a major,
a minor, a middle term, and of a major and minor pro-
position.

But there are some sorts of arguments, which, though not
strictly regular, yet need not be wholly rejected.   Such are,

1. An enthymeme, one premiss of which is wanting;
whether the major or minor, the conclusion shows ; as, He is
a good man : Therefore, he is happy.

Sometimes the whole argument lies in one sentence ; as,
Being mortal, do not bear immortal hatred.

2. An induction, in which what is granted of several particu-
lars is then affirmed universally ; as, This, and this, and that,
loadstone attracts iron : Therefore, every loadstone does.   It
is therefore a sort of enthymeme ; a syllogism in Barbara,
whose minor is understood.

3. An example, wherein what is granted of a known
instance is presumed of an unknown that resembles it ; as,
Sylla and Marius tore the commonwealth : Therefore, so will
Cæsar and Pompey.   Here also the minor is understood :
Therefore, the conclusion is only presumed, not proved.

4. A sorites, in whose antecedent every preceding term is
subjected to the following, till you come from the subject of the
conclusion to the predicate of it ; as, Every man is an animal ;
every animal is a living creature ; every living creature is a
substance : Therefore, every man is a substance.   In a sorites,
as many syllogisms are understood, as there are intermediate
propositions.

CHAPTER IV.

OF HYPOTHETICAL SYLLOGISMS.

SECTION I.

THAT is a hypothetical syllogism, in which one or more
of the propositions are hypothetical.   The most common
(of which alone we now speak) is that whose major proposi-
tion is hypothetical.

A hypothetical proposition is either conditional, as, If he
is wise, he is happy ; or disjunctive, as, Either it is day or
night.

In a conditional proposition, the condition itself is called the

antecedent; the assertion, the consequent; the connexion between them, the consequence.

The rules of conditional propositions are three :—

1. If the antecedent be granted, so is the consequent.

2. If the consequent be taken away, so is the antecedent.

3. Nothing can be inferred either from the taking away the antecedent, or granting the consequent.

There are therefore only two terms of conditional syllogism :—

The constructive; as,

If CD, then KΔ : But CD : Therefore KΔ :

And the destructive; as,

If CD, then KΔ : But not KΔ : Therefore, not CD.

SECTION II.

EVERY conditional syllogism is either equivalent to a categorical, or wholly to be rejected. For in every conclusive conditional, there is a categorical implied, in which the same argument would prove the same conclusion.

For in all hypothetical syllogisms, the major proposition consisting of two categoricals, the minor is either one of these, or the contradictory to it, in order to infer either the other or its contradictory. In either case, an enthymeme will be proposed, whose force lies in the conditional proposition, and which is not conclusive, unless from that proposition there can be drawn a completory, that is, the premiss which is wanting in an enthymeme, to complete the syllogism.

Now, as an enthymeme is only one premiss with the conclusion of a syllogism, it has three, and only three, terms. Suppose two of them are D and Δ, and C the third term. The other premiss, whose terms are D and Δ, is wanting. Hence it follows, that according to the various disposition of the terms, there are four forms of enthymeme ; each of which will admit of a twofold completory; as in this scheme :—

The Enthymeme.		The Completory	D.Δ.	Δ.D.
CD.	therefore CΔ.	The Major	in Fig. I.	in Fig. II.
DC.			in Fig. III.	in Fig. IV.
CD.	therefore ΔC.	The Minor	in Fig. IV.	in Fig. II.
DC.			in Fig. III.	in Fig. I.

Wherefore, as there are twenty-four possible moods of categorical syllogism, and fourteen unexceptionable ones ; and as each figure may be applied twice, to complete an enthymeme ; there will be forty-eight possible ways of completing it, twenty-

eight unexceptionable. And as many ways as an enthymeme may be completed, so many, and no more, a man may argue with a syllogism, whose major is conditional.

SECTION III.

THE directions given for conditional propositions, serve equally for disjunctive. For any disjunctive is easily turned into a conditional. For instance, if it runs thus:—

> It is either day or night.
> But it is day: Therefore, it is not night.
> But it is night: Therefore, it is not day.
> It is not day: Therefore, it is night.
> It is not night: Therefore, it is day.

Instead of this, it is easy to say,

> If it is day, then it is not night.
> If it is night, then it is not day.
> If it is not day, then it is night.
> If it is not night, then it is day.

SECTION IV.

THERE remains only a kind of redundant hypothetical syllogism, called a dilemma, which proposes two (or more) things to your choice, by accepting either of which, you lose the cause. Such is that of Bias: If you marry a beautiful woman, she will be κοινή; if an ugly one, ποινή: Therefore, marry none.

A dilemma is of no force, unless, 1. One or the other part must be accepted: 2. Either one or the other prove the point: And, 3. It cannot be retorted. If Bias had observed these things, he would have been less pleased with his own; for it fails in every particular. For, 1. A wife may neither be beautiful nor ugly: Therefore, neither part of the dilemma need be accepted. 2. Neither is every beautiful woman common, nor every ugly one a plague: Therefore, neither part of it proves the point. 3. It may be retorted thus: If I marry the one, at least she will not be common; if the other, she will not be a plague.

A dilemma is only a kind of negative induction, in which the major proposition is conditional; as, If at all, then thus, or thus, or thus. To turn this into a categorical syllogism, is so easy, it needs no direction.

A COMPENDIUM OF LOGIC.

BOOK II.

CHAPTER I.

OF SYLLOGISM, AS TO ITS MATTER.

SECTION I.

HITHERTO we have spoken of syllogism, as to its form. It remains to speak of it, as to its matter; that is, the certainty and evidence of the propositions whereof it is composed.

That is a certain proposition, against which nothing occurs, or nothing of weight, as, Man is risible; that, an evident one, which extorts the assent as soon as it is understood, as, The whole is greater than its part; that, a doubtful one, in which we know not how to determine, as, The stars influence men.

If anything occurs, whereby the mind inclines to either side, that which was doubtful before becomes probable. Such an assent is termed opinion.

Opinion, therefore, respects a barely probable proposition, and implies no certainty at all. Yet there are several degrees, whereby it approaches towards certainty; and the highest degree of probability is not far distant from it.

SECTION II.

CERTAINTY is twofold: 1. That of the object, the thing to be perceived; and, 2. That of the subject, the understanding which perceives it. And both have their degrees. That is more certain, in the former sense, to which there is the least objection; that, in the latter sense, to which the least objection appears. Evidence, also, is either of the object, or of the subject. And both of these have their degrees; according as that which is perceived is more or less self-evident, or appears to be one or the other.

We might enumerate many degrees of evidence. But it may suffice to observe, it is either, 1. That of a self-evident axiom; or, 2. That of a conclusion regularly deduced therefrom. This logicians term science; which accordingly they define, an assent to a certain and evident conclusion, regularly deduced from certain and evident premisses. The certainty and evidence here supposed, is that both of the object, and of the subject. For, by the former, science is distinguished from error; by the latter, from opinion. Without the evidence of the subject, there can be no science; and this without the other is imaginary evidence.

SECTION III.

WE need not prove that there is such a thing as certainty; seeing all reasonable men allow it. We freely assent to what is affirmed by a wise and good man; and more freely, if he confirms it by reason. Some things we are taught by nature itself; and some by Divine Revelation. And of all these we have sufficient certainty, although in various degrees.

To assent to testimony is the same as to believe; and such an assent is termed faith. Divine faith depends on the testimony of God: Human faith, on the testimony of man. What nature dictates, we may be said to perceive: What reason teaches us, to know.

God can neither deceive, nor be deceived: Men are often deceived, and often deceive. Reason and nature are not often deceived, and seldom deceive their followers. Nothing therefore is more firm than Divine faith: Nothing less so, than human. In what we perceive or know, there is often no fear, always some danger, of being deceived. Hence, there is the highest rest for the mind in Divine faith; the lowest of all in human. In what we know or perceive, there are various degrees of rest, according to the various evidence, certainty, or probability.

If, therefore, we were to make a sort of scale of assent, it might consist of the following steps:—1. Human faith, an assent to a doubtful proposition: 2. Opinion, to a probable: 3. What we may term sentiment, an assent to a certain proposition: 4. Science, to a certain and evident conclusion: 5. Intelligence, to a self-evident axiom: 6. Divine faith, to a Divine revelation.

SECTION IV.

To each of these there belong certain principles, which are peculiarly proper to produce it. The principles of Divine faith are those, and those only, which are contained in the Scriptures ; of intelligence, those which are properly termed axioms; of science, the conclusions regularly deduced from them.

An axiom is a proposition which needs not, and cannot, be proved. Such the following seem to be :—

From natural divinity. 1. God cannot deceive, or be deceived. Whence flow these certain and evident conclusions : 2. Absolute faith is due to the testimony of God : 3. Revelation never contradicts either sense or reason. It may indeed transcend both. But it cannot possibly contradict either, rightly employed about its proper object.

From mathematics. The whole is greater than each of its parts ; equal to them all. But mathematicians frequently lay down as such, what are not axioms, properly speaking.

From metaphysics. It is impossible for the same thing, at the same time, to be, and not to be. Some affirm this to be the only axiom in the world :—A point not worth the disputing.

From logic. Terms which agree in one and the same third, agree with one another.

SECTION V.

MANY believe that there are no axioms to be found in the other arts and sciences. But such principles at least are found therein, as produce sentiment, if not science. Such are these : Nothing (naturally) springs from nothing. Nothing is the cause of itself. What you would not have another to do to you, you ought not to do to another.

The principles that serve to produce opinion are usually styled maxims. They commonly hold, but not always. To this class those properly belong, which are, as it were, in the middle way, between doubtful and certain.

The uncertainty of human faith arises hence. In order to produce a firm assent of this kind, a competent witness must know what he says, and say what he knows, and both be apparent to him that believes it. But this is rarely the case.

N 2

Wherefore, we have always reason to suspect what we have no other proof of than human testimony, even when there appears no more reason to doubt thereof, than of a mathematical demonstration.

SECTION VI.

ACCORDING to these five degrees of assent, syllogism might have been divided, with regard to its matter, into infallible, scientifical, certain, probable, and doubtful. But as the two first of these produce science, and any assent short of this is, loosely speaking, termed opinion; it is usually divided only into two sorts: 1. That which produces science; and this is styled scientifical, otherwise demonstrative, and often demonstration: 2. That which produces opinion, (any assent short of science,) and is termed dialectical; that is, arguing probably.

There are two species of demonstration. The First demonstrates that a thing is; proving either directly that it is so, (and this is called direct demonstration,) or that if it be not, some absurdity will necessarily follow. This is usually called, *demonstratio ab absurdo*. We may properly term it oblique.

We demonstrate directly either, 1. By proving a thing from its effect; as, The sun is black: Therefore, it is eclipsed: Or, 2. By proving it from its remote cause; as, The moon is diametrically opposite to the sun: Therefore, it is eclipsed. But if we prove this from the earth's being interposed between them, this is,

The Second sort of demonstration, which demonstrates why a thing is, by assigning its proximate and immediate cause.

But there may be a proximate, which is not the prime cause, that is self-evident and indemonstrable, whose evidence is therefore preferred before all other, as needing no light but from itself.

There are then four degrees of demonstration: The oblique demonstration is good; but the direct is preferable to it. Demonstration by the proximate cause is better still; but the prime cause, best of all.

CHAPTER II.

OF FALLACIES.

THERE is yet another species, or shadow rather, of syllogism, which is called a fallacy. It is an argument intended to deceive. Such is,

1. The fallacy of equivocation, arising either from an equivocal word, or from the ambiguous structure of the sentence; as, All that believe shall be saved. The devils believe: Therefore, the devils shall be saved. This offends against the very first rule of syllogism. For it has four terms.

2. The fallacy of composition, where what is granted of several things separately is inferred of them conjointly; as, Two and three are even and odd. Five is two and three: Therefore, five is even and odd.

3. The fallacy of division, when what is granted of things taken conjointly, is inferred of them taken separately; as, The planets are seven. The sun and moon are planets: Therefore, the sun and moon are seven. In both these syllogisms there are four terms.

4. The fallacy of the accident, when some accidental circumstance is confounded with what is essential; as, What destroys men, ought to be prohibited. Wine destroys men: Therefore, wine ought to be prohibited. The major proposition must mean, What necessarily destroys men; otherwise it is not true: The minor, Wine accidentally destroys men. Therefore, here, also, there are four terms.

5. The fallacy of arguing from a particular to a general; as, He that is white as to his teeth, is white. A blackamoor is white as to his teeth: Therefore, a blackamoor is white. Here is a palpable breach of the sixth rule of syllogism.

6. The fallacy *ignorationis elenchi.* An *elenchus* is a syllogism that confutes the opponent. Therefore, he falls into this fallacy, who thinks he confutes his opponent, without observing the rules of contradiction.

7. The fallacy of begging the question, that is, taking for granted the very thing which ought to be proved. This is done, (1.) When we attempt to prove a thing by itself: Or, (2.) By a synonymous word: Or, (3.) By something equally

unknown: Or, (4.) By something more unknown: Or, (5.) By arguing in a circle; as in the famous argument of the Papists, who prove the Scriptures from the authority of the Church, and the Church from the authority of the Scriptures.

8. The fallacy of several questions; as, Are honey and gall sweet? It is solved by answering to each branch distinctly.

Many more fallacies than these might be reckoned up. For there are as many fallacies as there are ways of breaking any of the rules of syllogism without being observed. But one who is thoroughly acquainted with those rules, will easily detect them all.

CHAPTER III.

OF METHOD.

SECTION I.

METHOD is such a disposition of the parts of any art or science, that the whole may be more easily learned.

It is twofold: 1. Method of invention, which finds out the rules of an art or science: 2. Method of teaching, which delivers them. The former proceeds from sensible and particular things, to intelligible and universal; the latter, from intelligible and universal things, to sensible and particular.

Method of teaching is either perfect or imperfect. The former is either, 1. Universal, by which a whole art or science; or, 2. Particular, by which a part of it only, is taught. Both are either, 1. Synthetical, which is used in sciences, and, beginning with the subject of a science, treats of its principles and affections, and then of its several species, till, from the highest genus, it descends to the lowest species: Or, 2. Analytical, which is of use in arts; and, beginning with the end or design of an art, next explains the subject of it, and, lastly, the means conducive to that end.

The general rules of method are these:—

In delivering an art or science, 1. Let nothing be wanting or redundant: 2. Let all the parts be consistent with each other: 3. Let nothing be treated of which is not homogeneous to the end of the art, or the subject of the science: 4. Let the parts be connected by easy transitions: 5. Let that

precede, without which, the things that follow cannot be understood, but which itself can be understood without them.

The particular rules are these: 1. The unity of a science depends on the unity of its subject; the unity of an art, on the unity of its end. 2. Let the more general parts precede the less general.

The imperfect method is arbitrary and popular; being no other than the method of prudence or common sense.

SECTION II.

MATHEMATICIANS, in all their writings, follow this method: 1. They fix the meaning of their words, defining their terms, each in their place, and make it an invariable rule, never afterwards to use any term, but in the sense to which it is limited by that definition. 2. They lay down the axioms which there will be occasion to use in the course of their work. 3. They add their *postulata*, which also they demand to be granted, as being evident of themselves. 4. They then demonstrate their propositions in order, and, as far as may be, affirmatively; contenting themselves with this rule, That whatsoever they have to prove, they take care to prove it from some of the truths which have been granted or proved before.

If the same method cannot be strictly observed in other sciences, yet doubtless it may be imitated. And the nearer any method approaches to this, the more perfect and useful it is.

APPENDIX.

OF THE MANNER OF USING LOGIC

EXTRACTED FROM BISHOP SANDERSON.

———

SECTION I.

OF TREATING ON A SIMPLE THEME.

WE may use the rules of logic in treating either on a simple theme, or a problem or proposition.

In treating logically on a simple term, we are to explain both the name and the thing. And,

1. The name, by, (1.) Pointing out the ambiguity of the term, (if there be any,) recounting its various meanings, and fixing on that particular meaning in which we at present take it: (2.) Showing its various appellations, both in our own and in other tongues: (3.) Observing whence it is derived, with the more remarkable words of the same derivation. Not that all this is necessary to be done at all times, and on every theme; but there is need of judgment and choice, that those particulars only may be noted, which conduce to the explication of the thing.

2. The thing is explained both by assigning its attributes, and distributing or dividing it into its parts. The attributes are either essential or non-essential. By essential we understand, not only those which properly constitute its essence, the genus and difference, but also the properties of substances, the subjects and objects of accidents, with the efficient and final causes of both.

The genus should be assigned in the first place, and that the nearest which can be found; though premising, if occasion be, those which are more remote. The difference comes next; the want of which is supplied, and the nature more fully explained,

by properties. And here may be added, the efficient, principal, impulsive, and instrumental causes, with the remote or proximate ends. Here also, in treating on an accident, may be subjoined its proper subject and adequate object: But these, more or less, as need shall require; which are to be closed with a complete essential definition of the thing.

3. The theme is next to be distributed into its several species or parts, just to name which is generally sufficient. From distribution we proceed to the non-essential attributes, whether effects, cognates, or opposites.

4. Such effects as are trivial, or commonly known, may either be just mentioned or passed over in silence. Those which are more noble, and less commonly known, may be ranged under proper heads. This is also the place for citing examples.

Cognate words are those which are compared with the theme, as agreeing with it; opposite, as differing from it. A theme is explained by comparing it with its cognates, when things are mentioned, which are, in some respects, the same, or like it; and it is shown wherein that sameness or likeness lies, and also wherein the unlikeness or difference between them.

We, in the last place, compare the theme with its opposites : For even opposites cast light upon each other. There are four species of these; but the contradictory is usually too vague and indefinite to be of any service: And the relative opposite has been mentioned before, among the essential attributes. Therefore, the privative and contrary opposites only have place here, and very properly close the treatise.

To give an instance of this : Suppose the simple theme to be treated of be ENVY.

I. I am to consider the name. And here I observe,

1. It may mean either actively or passively; as, He is full of envy; that is, he envies others. A rich man is much exposed to envy; that is, to be envied by others. We here take it in the former sense.

2. This is in Latin termed *invidia*, a word which has been borrowed by many modern languages. The Romans also termed it *livor*.

3. The word *invidia* is supposed to be derived from two Latin words, that imply the looking much upon another, which the envious are apt to do; the word *livor*, from the livid complexion which usually attends an envious temper.

There are two words of the same derivation, which are frequently confounded with each other; namely, invidious, and envious; and yet the signification of the one is widely different from that of the other. An envious man is one who is under the power of envy; an invidious office, one that is apt to raise envy or dislike.

II. In explaining the thing, I observe, First, the essential attributes; as,

The genus: To premise the more remote; it is a passion, a sort of grief: But the nearest genus is, a vicious grief.

I next observe the difference, taken,

1. From the subject, which are almost all mankind; but chiefly those who are ignorant of God, and consequently unable to govern themselves.

2. From the object, which is twofold; of the thing, or of the person. The thing envied may be good of any kind; apparent or real, useful or pleasant; of mind, body, or fortune. The person envied may be any other man, superior, equal, or inferior; only not at an immense distance, either of time, of place, or of condition. For few envy them that have been long dead, them that live in China or Japan, or those who are above or beneath them beyond all degrees of comparison.

3. From the efficient cause. The principal internal cause in him that envies is pride and inordinate self-love. The impulsive external cause may be various, either in him that is envied, if he be an enemy, a rival, a vain boaster; or in some third person, as contempt, flattery, whispering; any of which may stir up envy.

We may therefore define envy, either more briefly, a vicious grief at the good of another; or more fully, an evil sadness of mind, whereby a man, from inordinate self-love, is troubled at the good which he sees another enjoy, or foresees he will enjoy, as he imagines it will lessen or obscure his own excellency.

III. There are three species of envy, each worse than the preceding: The First, when a man is pained at another's enjoying some good (in kind or degree) which he cannot himself attain: The Second, when a man is pained at another's having what he himself has, but wants to have alone: Both these are exemplified in Cæsar, who would bear no superior; and Pompey, who would bear no equal. The Third is, when a man cannot or will not enjoy his own good, lest another should enjoy it with him.

It is well known how many in the learned world are infected with this evil disease.

IV. The effects of envy are three: 1. It torments the mind continually, and spreads inquietude through the whole life. 2. It wastes even the bodily strength, and drinks up the spirits: A most just evil, which is at once a sin and a punishment, and not less a scourge than it is a vice. 3. It incites a man to all manner of wickedness; detraction, calumny, strife, murder.

Its most remarkable cognates are, 1. Hatred, which agrees with envy in its subject. For he who envies another cannot but hate him; and in its efficient, internal cause, which in both is pride and blind self-love. 2. Rejoicing in evil. This also agrees with envy both in its subject, (for he that grieves at another's happiness cannot but rejoice in his misery,) and in its efficient cause.

And yet hatred differs from envy, 1. In the thing hated or envied. For good only is envied; but either good or evil may be hated. 2. In the person. For we envy men only, not God; and not ourselves, but others; but we may hate both other men, and ourselves; both other creatures, and God himself.

Rejoicing in evil differs likewise from envy, 1. In the genus. For the genus of the latter is sorrow; of the former, joy. 2. In the object, which in the one is evil; in the other, good.

The grand opposite to envy is benevolence, a tender good-will to all men, which constrains us to wish well to all, and seriously to rejoice in all the good that befalls them.

SECTION II.

OF TREATING ON A PROBLEM.

A PROBLEM is a proposition to be proved. It is sometimes fully proposed, whether positively, as, Logic is an art, which is called a thesis; or interrogatively, as, Is logic an art? Sometimes imperfectly, when the subject only is mentioned, the predicate being left in question, as, Of the genus of logic.

In a regular treatise on a problem there are three parts; the

stating the question, proving the truth, and answering objec-
tions. To which may be premised, the introduction, concerning
the importance of the question, and the occasion of its being
first disputed; and the conclusion, containing a recapitulation
of the whole, with the corollaries arising therefrom.

1. In the introduction may be shown, that the point in
debate is not of little or no moment, but either apparently
of the highest concern, or if not so important in itself, yet
absolutely necessary to be understood, in order to under-
stand or explain those which are confessedly of the highest
moment. Next should be pointed out the occasion of the doubt;
and the origin of the error; what gave the first rise to this dis-
pute; and how the mistake began and increased. But this must
be done nakedly and simply, in a logical, not rhetorical manner.

2. After a short preface, the problem is not immediately to
be proved, (unless where the terms are quite clear, and the
point little controverted,) but first the terms of the question
are to be explained, both the subject and the predicate. The
various senses of these should be observed, and the definitions
given, particularly of the predicate. We then proceed to
explain the true state of the controversy, by showing what is
granted on each side, and what disputed. For in every con-
troversy there is something wherein both parties agree, and
something wherein they differ. In reciting the points wherein
we and our opponents agree, we may add, if need be, a short
explanation or proof of them; and then show wherein
the proper difference, the very point of controversy, lies. If
this be accurately shown, the business is in a manner done;
for it is scarce credible, how much light this throws both on
the proof of the truth, and the answering objections.

3. In proving the truth, if it be a plain, simple problem, it
may suffice briefly to propose our judgment in a single affirma-
tive or negative thesis, and to confirm it by a few well-chose
arguments. But if it be more complex, it will be expedient
to comprise our defence of it in several propositions; begin-
ning with those wherein we remove the opinions of others, and
then going on to establish our own; after every proposition
placing the arguments by which it is confirmed. But it does
not suffice, barely to mention these; they are also to be
strongly pressed and defended, and the evasions and cavils
of all adversaries to be examined and overturned.

4. Next follows the answering of objections. These may

either be subjoined to the several opinions of our opponents, and so answered severally; or all placed together, after we have proved the point in question, and so answered all together.

In order to do this effectually, we should observe, First, Is not the conclusion advanced against me wide of the mark? Frequently the objection may be allowed, and it does not overturn any conclusion which we have advanced. Nay, sometimes it may be retorted, as proving just the contrary of what it was intended for.

If the conclusion do really contradict any of ours, we are, Secondly, to examine the form of the argument, according to the general and particular rules of syllogism; and to point out that rule against which it offends.

If the form be unexceptionable, it remains, Thirdly, to consider the matter of the objection from the premises. And it will generally be found, that either one of the premises is false, (or at least, not sufficiently proved,) or that there is a latent ambiguity in the subject, the predicate, or the medium. In this case, we are to fix upon that term, and show the ambiguity of it.

5. We may close the whole by repeating the sum of what has been proved; unless when some useful observations or corollaries, either directly, or by easy consequence, follow from the conclusions before established. These we are not to prove again, but briefly and nakedly to set them down, as naturally deducible from those propositions which have been proved before.

The Sermon on the Means of Grace, in the first volume of Mr. Wesley's Sermons, is a treatise of this kind.*

The Sermon on Enthusiasm, in the third volume, is another example of a simple theme.†

* Vol. V., p. 185, of the present edition.—EDIT.
† Vol. V., p. 467, of the present edition.—EDIT.