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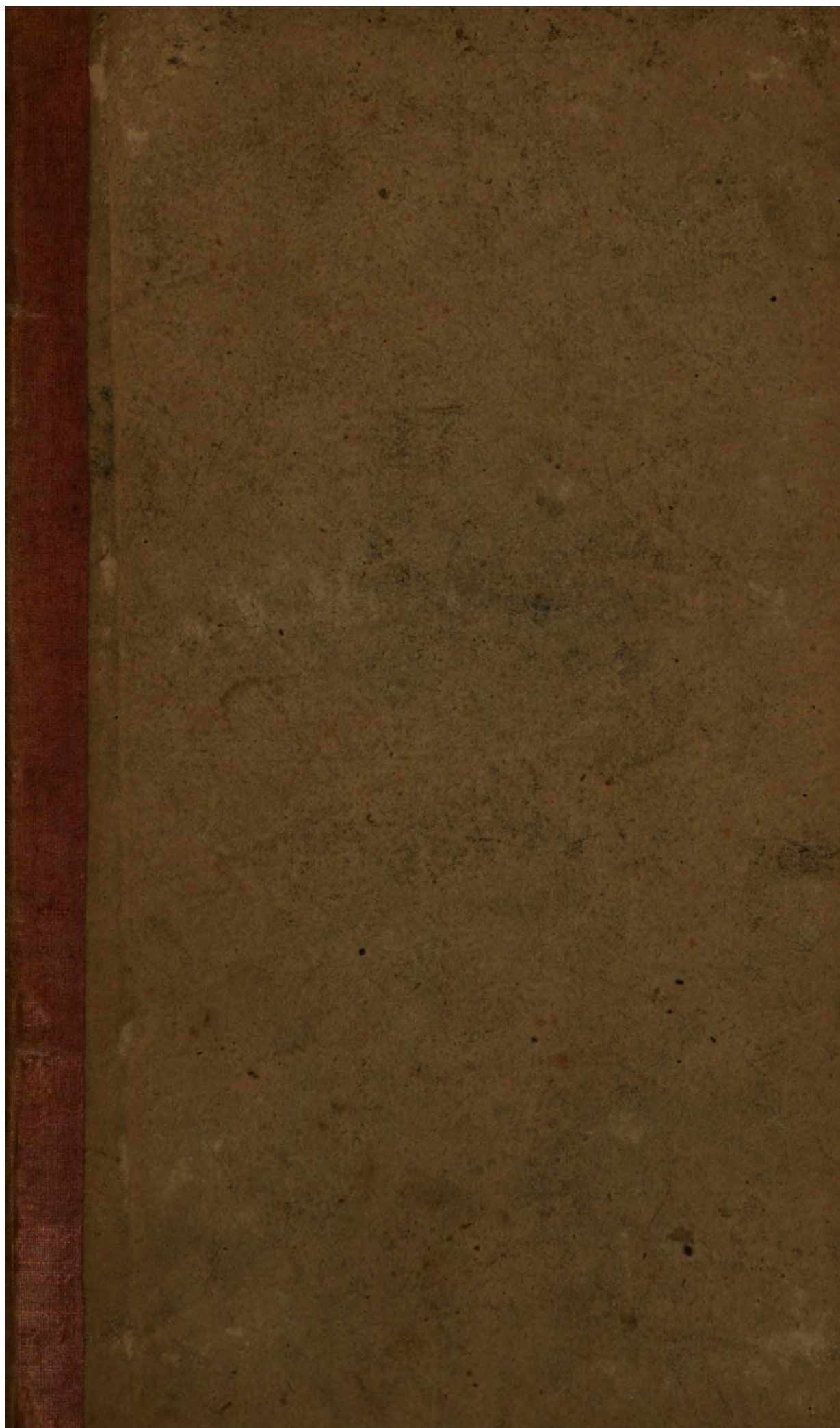
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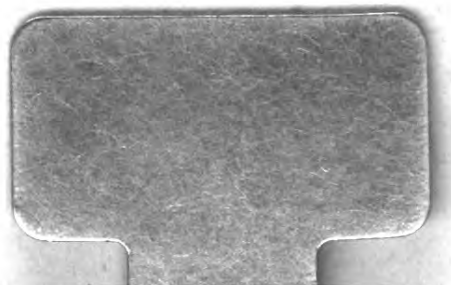


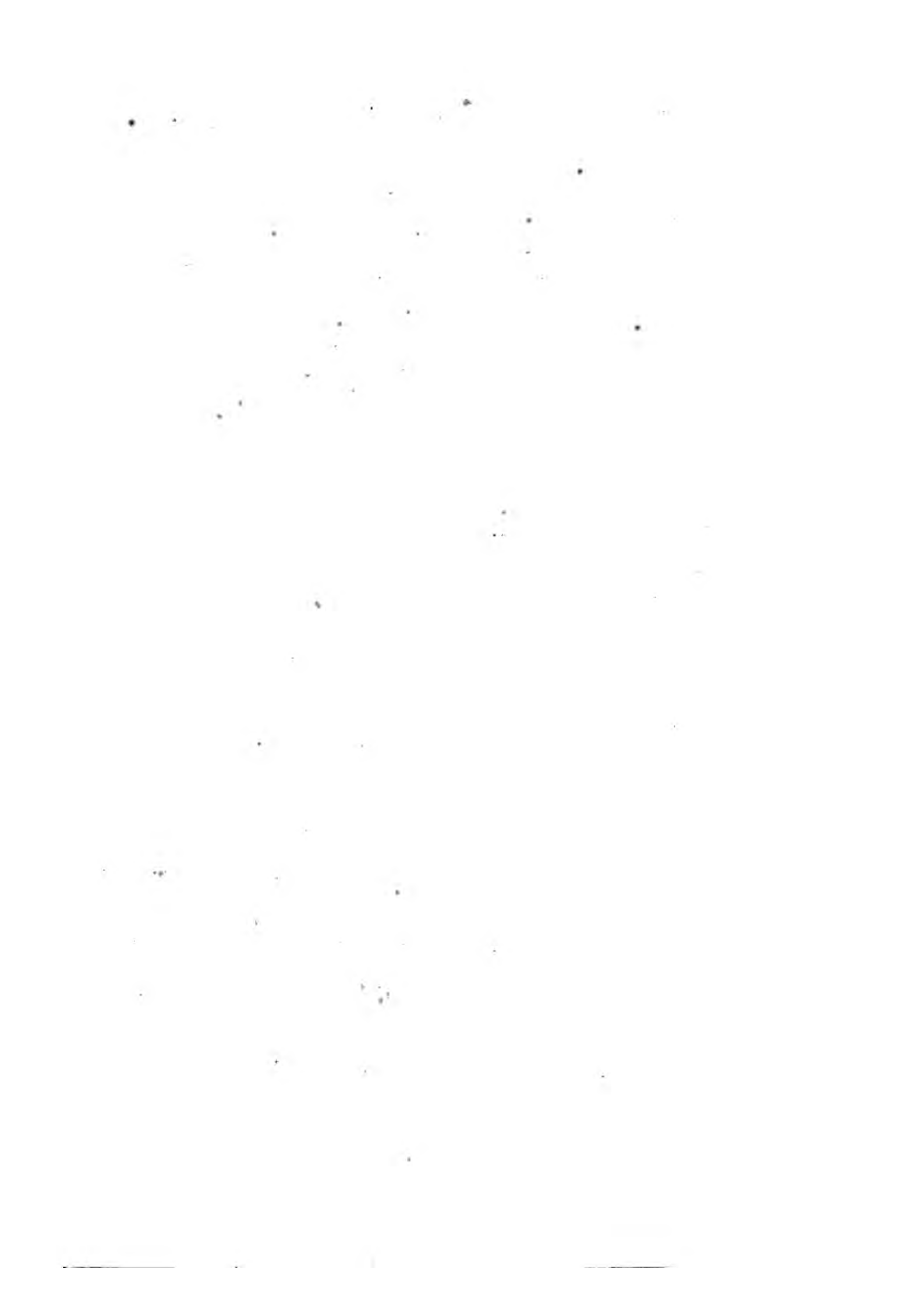
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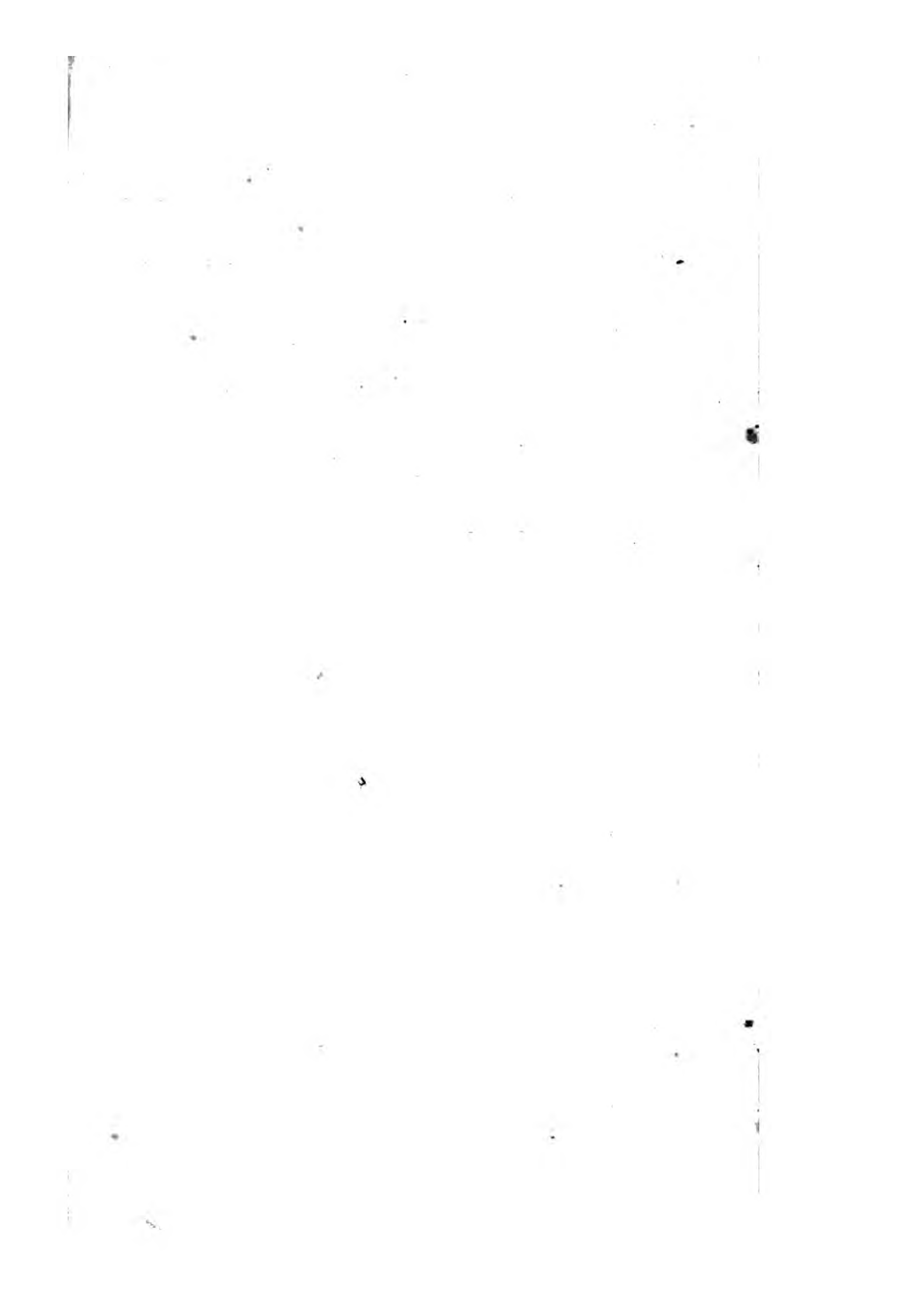




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ARTIS LOGICÆ

RUDIMENTA.

Adrian (Hans)

ARTIS LOGICÆ

RUDIMENTA.

WITH

ILLUSTRATIVE OBSERVATIONS

ON EACH SECTION.

=====
FOURTH EDITION.
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ARTIS LOGICÆ

RUDIMENTA.

CAP. I.

DE TERMINIS SIMPLICIBUS.

§. 1. *De Mentis Operationibus.*

MENTIS operationes in universum tres sunt.
1. *Simplex Apprehensio.* 2. *Judicium.* 3. *Discursus.*

The office of Logic is the developement of the natural process of the human mind in the act of reasoning. It has therefore a close alliance with that branch of Metaphysics which relates to the operations of the mind. These operations are indeed so diversified that the enumeration of them might be carried to an almost unlimited extent. But, if not all, those at least with which Logic is connected, may be reduced to these three classes, *Simple Apprehension, Judgment, and Reasoning.* The act of *Reasoning* is, in fact, the subject-matter of Logic; and to this the exercise of the other two operations are subordinate.

1. *Simplex Apprehensio*, est nudus rei conceptus intellectivus, similis quodammodo perceptioni sensitivæ; sicut enim *imago* rei est in oculo, ita *idea* in animo: estque *Incomplexa* vel *Complexa*.

Simple Apprehension is "the mere intellectual conception of a thing." The *operation* of this primary faculty of the mind is also called *perception*, or *conception*. And the *result* of the operation of this faculty on any particular object is denominated, properly, a *notion*, and metaphorically, an *impression*, a *conception* or *perception*, an *idea* or *form*, an *image* or *representation*. These figurative terms are borrowed from sensitive perception; an analogy having been supposed to exist between mental apprehension, and the effects of natural objects on the bodily senses; especially on those of feeling and sight. This imaginary similitude however seems to be inconsistent with correct metaphysical principles. It is not easy to attach a definite sense to that mode of speaking which assumes that any kind of form or picture of material objects can be traced on an immaterial substance; or that it is possible to produce a representation or image of mere qualities or attributes, as, *virtue*, *heat*, *propensity*. The mind *apprehends* the abstract language of the mathematician, when he asserts that $x + y = a$; or of the lawyer, when he puts the case, that *A. B. is indebted to C. D.* But there cannot exist in these acts of apprehension any thing really analogous to the effect of sensible objects on the sight or feeling. In fact, the mode in which the mind is primarily acted upon appears to be an incomprehensible mystery.

Apprehensio simplex Incomplexa, est unius objecti, ut *calami*; vel etiam plurium, confuse, ut *calami*, *manús*, &c. *Complexa*, plurium, sed cum ordine quodam et respectu; ut *calami in manu*.

The term, *Incomplex Simple Apprehension*, taken in its metaphysical and proper sense, denotes a pure,

uncompounded, and consequently indivisible notion or conception ; as, *hardness, extension, colour, essence*. *Complex Simple Apprehension*, metaphysically understood, denotes every combined or divisible notion ; as that of *Man*, which may be reduced to the simpler notions of *animality*, and *rationality* : *Table*, including the notions of the *material*, the *form*, the *use*, &c. *Gratitude*, which comprehends the notions of a *benefactor*, a *recipient*, *benefits conferred*, the *remembrance* of those benefits, the *love*, or *esteem* excited by them, &c.

But for the purposes of Logic, it is not unusual, (although decidedly inaccurate,) to call those apprehensions *incomplex* which are expressed by a single word. Such are the notions denoted by the following examples : *Time, invaluableness, treasure, revenge, kind, wildness, justice, relation or property* (implied in the particle *of*), *individuality* (implied by *the*). Each of these words represents an *incomplex simple Apprehension*, according to the more vague use of that expression : although, in truth, most of the notions they denote are *complex*.

When words are so combined as to create a grammatical relation or dependence, they are representatives of *Complex Apprehensions* : as ; *That invaluable treasure, time. That wild kind of justice called revenge. The possession of power to suspend the prosecution of our desires.*

Thus also, the faculty by which we comprehend the meaning of whole sentences, or of series of sentences to any extent, is *Complex simple Apprehension*. Under the same term are likewise included the mental powers and operations of consciousness, imagination, memory, anticipation, association, abstraction, generalization, arrangement, &c.

2. *Judicium*, est quo mens non solum percipit duo objecta, sed, quasi pro tribunali sedens,

expresse apud se pronuntiat, illa inter se convenire aut dissidere.

Est enim Judicium aliud *Affirmativum*, quod vocatur etiam *Compositio*; aliud *Negativum*, quod est *Divisio*.

Porro, tam particula *Est*, quæ affirmando convenientiam exprimit, quam *Non-Est*, quæ negando dissidium, appellatur *Copula*; (sicut et Grammatica *Conjunctiones disjunctivas* habet;) atque hanc determinando differt Judicium ab Apprehensione complexâ.

E. g. Si quis dixerit *Triangulum æquilaterum esse æquiangulum*, possum Apprehensione simplici incomplexâ intelligere quid sibi velint singula orationis hujus vocabula, complexâ vero quid tota sibi velit oratio: Quin et ipsius naturæ lumine intelligo, duo quælibet objecta vel inter se convenire, vel non convenire; et proinde alterâ copularum esse jungenda: Nondum tamen feci judicium donec copulam determinaverim, i. e. apud meipsum statuerim hæc duo objecta, *Triangulum æquilaterum*, et *Triangulum æquiangulum*, hâc copulâ *Est*, non autem alterâ *Non-Est*, oportere conjungi.

By the operation of *Judgment* the intellectual faculty compares any two objects, and decides on their mutual agreement or disagreement.

The simple act of understanding the sense intended to be conveyed by any assertion, whether affirmative or negative, is the office of *Apprehension*. The acquiescence or non-acquiescence of the mind in that assertion is the exercise of *Judgment*.

The Substantive Verb alone, in the present tense of the indicative mood, constitutes the *affirmative Copula*. The same verb, qualified by the negative adverb, constitutes the *negative Copula*, which is necessary to the expression of a negative judgment. The affirmative judgment is called *Composition*, because it *places together* and *unites* the two objects compared, as agreeing with each other. The negative judgment is called *Division*, because it, as it were, *divides* or *separates* objects from each other, by expressing a disagreement between them. Yet the verb of existence combined with the negative particle is rightly called a *Copula*, since it serves to unite in one sentence the terms which express those objects of comparison.

The trains of thought which are expressed in the following sentences, afford examples of Judgment :

Time is an invaluable treasure.

Revenge is a kind of wild justice.

That which is past and gone is irrecoverable.

It is the glory of a man to pass by an offence.

— *Man knows not how to value right*

The good before him ; but perverts best things

To worst abuse, or to their meanest use.

A flatterer is not deserving of a wise man's esteem.

3. *Discursus*, est motus sive progressus mentis ab uno *Judicio* ad aliud ; quod et *Ratiocinium* dicitur ; et significatur copulâ illativâ, qualis est *Ergo* aut alia similis. v. g. *Qui est extra fortunæ potestatem est beatus. Sapiens*

est extra fortunæ potestatem. Ergo, Sapiens est beatus.

Reasoning consists in the comparison of judgments in which the mind has previously acquiesced, and in deducing from them a new and distinct judgment. For example;

No element is liable to decomposition; Water is liable to decomposition; Therefore water is not an element.

Whatever makes a man most effectually superior to his enemies confers genuine glory; But the disposition to pardon their injuries makes him most effectually superior to them; Such a disposition therefore confers genuine glory.

It is an undeniable truth, that it is the glory of a man to pass by an offence; for the wisest of men asserts it to be so.

The mention made in the text of the characteristic particle which denotes an inference has relation, not to the operation of reasoning, but to the language in which it is expressed. It is therefore somewhat misplaced here. The same observation applies in some degree to the mention of the copula employed in expressing judgment. But it is very difficult to speak of the pure mental operations without some reference to the modes of communicating them. It is however useful to habituate ourselves to view them as really distinct.

The English word *Discourse*, in the sense of *reasoning*, is obsolete, and ambiguous. The ambiguity is very manifest in a passage of Dryden, the force of which is much weakened by the use of this word. The poet addresses the deist thus :

Vain, wretched creature! how art thou misled,
To think thy wit these god-like notions bred!
These truths are not the product of thy mind,
But drop from heav'n, and of a nobler kind.

'Hence all thy nat'ral worship takes the source,
'Tis Revelation, what thou think'st *discourse*.

The expression, *discursive faculty*, is however not uncommon, nor is it liable to the same objection.

Singulis operationibus sui accidunt defectus.
Apprehensioni, *Indistinctio* ; Judicio, *Falsitas* ;
Discursui, *Mendosa Collectio*.

1. There are innumerable objects of which our *notions* or *apprehensions* must, from the weakness of our nature, be unavoidably *indistinct*. Such, for instance, are our conceptions of the *Divine Being*, and of all his attributes, *Infinity*, *Omnipotence*, *Omniscience*, *Perfection*, &c. The apprehensions we form of *Heaven*, of *Angels*, of the *Human Soul*, of the *Operations of our own minds*, are necessarily *indistinct*.

In numberless other instances our ideas are *accidentally indistinct* ; that is, not from any *inherent* defect, but from the want of an actual acquaintance with the object, arising from the deficiency either of opportunity or of observation. Thus an uninstructed person forms an inaccurate conception of the nature and use of *philosophy* : A native of the torrid zone has an indistinct apprehension of *ice* : The ancients had no correct notion of an *eclipse*. Of those objects with which we are familiar we form ideas proportionately *less indistinct* ; but there exist probably very few things, the nature of which we can be said, strictly speaking, to comprehend *distinctly*.

2. Nor is the faculty of *judgment* free from imperfection. It is misled by *sense* in the rustic who conceives that *The earth is stationary* ; or that *The sun rises out of the sea*. It is unduly influenced by *authority and example* in those who conceive that *Earth, air, fire, and water, are simple elements* ; and

in the illiterate mechanic, who judges that *All which some factious demagogue says must be true*: and that *Whatever Government does must be wrong*. It is often perverted by the *passions*; as when men decide that *The Gospel consists in the repeal of the obligation of the moral law*; that *Honesty is the whole of religion*; that *Pride is noble*; that, *Revenge is a branch of justice*. The Lycaonians at Lystra were guilty of a false judgment, when they said of Paul and Barnabas, *The Gods are come down to us in the likeness of men*. So also were the Pharisees, when they said of our blessed Lord, *We know that this man is a sinner*.

3. The powers of *reasoning* are likewise imperfect. The defect in this faculty manifests itself when a conclusion is supposed to be derived from judgments or principles on which it has no real dependence. Thus in the apparent argument, *Kings deserve honour; but subjects are not kings; therefore subjects do not deserve honour*; the two introductory judgments are correct: but it does not follow from them that *none besides kings deserve honour*, and consequently that *subjects do not deserve honour*. Again, in this form of reasoning; *Severe punishments are requisite to suppress the progress of crime; now capital punishments are undoubtedly severe; these therefore are requisite for that purpose*; the judgments which form the basis of the argument are correct; but they comprehend nothing which authorizes the inference professedly deduced from them, because they do not prove that the particular kind of severe punishments specified belongs to that class of severe punishments which are requisite for the suppression of vice. The last judgment therefore may, so far as depends on the others, be either correct or incorrect.

It is not unusual for the mind to find itself bewildered by such arguments; while it feels their insufficiency, but is unable to discover where the

error lies. One important purpose of Logic is, by analysing the mental process, and by classifying the various occasions of error in the mode of deducing inferences, to afford a facility in detecting fallacies.

It may be further observed, (although the observation does not immediately belong to this branch of the subject,) that if the previous judgments on which an argument depends, or either of them, be inaccurate, while the reasoning process is carried on correctly, the new judgment deduced from them will probably, but not necessarily, be erroneous. If from the principles, *Singularity ought by all means to be avoided*, *To continue sober in a company of drunkards is singularity*, it is inferred that, *To continue sober in a company of drunkards ought by all means to be avoided*; the argumentative process is correct; and the falsehood of the conclusion is to be attributed to the falsehood of the principle on which it is founded.

This is one of the most extensive means of the propagation of error; and it is the more effectual, because, in consequence of the elliptical mode of argument usually adopted, the unsound principle does not meet the eye or ear, but is only insinuated. This is the case in the following examples, in which the false principle that *any measures, however unlawful, may be resorted to for the purpose of maintaining reputation or avoiding unpleasant imputations*, is implied though not expressed.

I must accept a challenge, or else I shall incur the imputation of cowardice.

Revenge is usually esteemed a mark of a noble spirit, and is therefore to be indulged in order to maintain our reputation.

Thus the Pharisees argued from an erroneous principle when they inferred that our blessed Saviour was *not of God*, because he kept not the sabbath day according to their traditions.

The Melitans reasoned from an inaccurate judgment, when they drew the erroneous conclusion:

This stranger is about to be killed by a venomous serpent ; therefore he is a murderer pursued by vengeance. Nor were their principles more correct when, on seeing the Apostle shake off the animal without injury, they said that he was a god.

Quæ cum Sapientes animadverterent, et opportuna illis remedia excogitâssent, præcepta sua in unum compegêre; eorumque Scientiam dixêre *Logicam*, sive *Artem Rationis*.

Logic, like Rhetoric, is not a mere artificial acquisition ; but is natural to man : yet it is imperfect, as has been already shewn by an induction from the several faculties of the mind to which it bears relation ; and it is therefore improvable by observation and study. Nor does it afford any just objection to the utility of a system of Logic, that many are able to form accurate conceptions, to judge correctly, and to reason well, without having studied any such system : or that many, after a familiar acquaintance with the technicalities of Logic, still continue to be weak reasoners. Without such study, the latter may have been still more incompetent : with it, the former would have acquired a still greater command of their reasoning powers.

Est igitur *Logica*, Ars instrumentalis dirigens mentem in cognitione rerum : ejusque partes tres sunt, pro operationibus mentis quas dirigit. 1. *De Simplici Apprehensione*. 2. *De Judicio*. 3. *De Discursu*.

Logic is both an *art*, and a *science*. It is here more properly called an *art*, because it is considered as relating to something which is *to be done*,

not to any thing which is *merely to be known*; to *practice*, not to *theory*. It is true that every system of practice must have a corresponding theory: that every art must have a science: but when the theory or science is simply subordinate to practice, the term art is more frequently adopted, unless any particular distinction is intended. Thus we speak of the art of building, of composition, although the theories of these arts are justly denominated sciences.

Logic is not a *final* art; that is, an art the end and object of which consists in the performance itself, and which is therefore practised solely or primarily for its own sake; such as the art of playing on musical instruments, &c. On the contrary, it is studied and exercised only with a view to some further object, distinct from itself; and is therefore an *instrumental* art. Thus the art of *building*, of *warfare*, of *government*, are *instrumental* arts; carried on not for their own sakes, but for the sake of their natural results, or the ends to be acquired by their exercise; as, the existence of the edifice required, the defence of our country, the maintenance of social rights and order.

Every instrumental art must have some appropriate office. The office of Logic is *to direct the mind in the knowledge of things*. It does not guide us *into* the knowledge of things: for it does not make us to know, or communicate knowledge. The folly of expecting from it more than it professes has, by a natural reaction, become the occasion of the low esteem in which many hold it. It has been treated like some useful medicines, the advocates of which have so overrated their virtues as to induce the cautious to reject them as altogether worthless. Logic may exercise the mind, but it cannot supply the place of natural faculties, or of the external material on which the faculties are to act. It is the mere *tool*, requiring strength and

skill for its use. It is a *staff*, which cannot discover the road, nor convey its bearer into it; yet enables him to proceed with greater ease when he is in the right path. Its office is to *assist* and *direct* the mind while engaged in the pursuit or communication of knowledge.

§. 2. *De Vocibus.*

QUONIAM vero, inter docendum et disputandum, neque res aliqua, neque conceptus, cui subjacet, commode in medium afferri potest; necesse est vicaria utriusque signa substituere, quorum usum idoneum docendo, Logica mentem unâ ad bene operandum instruit.

Hujusmodi signa apud homines recepta, sunt *Voces*: Nam *Vox* est signum rei vel conceptûs ex instituto vicarium: et in significando, primo quidem *declarat* conceptum, deinde *supponit* pro re. Dico autem *ex instituto*, quia soni inarticulati, vocesque quas natura sponte suggerit, extra artem censentur.

A Word is an arbitrary vicarious sign of a thing or of an idea.

It is a *sign*; a mark or token of the existence of some thing or of some conception intended to be expressed or represented by it.

It is a *sign of a thing*; inasmuch as it serves to represent the object which is known by that particular combination of sounds or forms. Thus the word *London*, as addressed either to the eye by symbols or to the ear by sounds, represents the city to which custom has affixed that name. The same is

represented by the word, (or, grammatically speaking, the combination of words,) *The chief city of this country.*

A Word is also the sign of an idea or conception. The word *London*, or *The chief city of England*, intimates that the notion or conception of the thing denoted by that word exists in the mind of the speaker or writer, which he wishes to communicate to another by exciting a similar notion in *his* mind.

A Word is usually considered to be at once the sign of a thing and of an idea. But these may be separated. It may denote a thing without a corresponding idea; as when we repeat that which we do not understand. Or it may denote an idea without a corresponding thing. Of this character are not only words expressing mere creatures of the imagination, as, *fairy, griffin*; and those which denote negative ideas, as, *privation, invisibility*: but, as will hereafter be shewn, all terms which represent abstract ideas.

Again, a Word is a vicarious sign. It not only (like a painting suspended before a house of entertainment) gives information of the existence of the thing denoted; but (like a bank note) it supplies the place of that which it represents. It first declares the idea or notion in the mind; it then sets that idea or notion in the place of the object which excites it; treating the idea and the thing as if they were one and the same; and lastly, it is itself employed as a substitute both for the object, and for the idea which that object excites. Thus in the sentence, *London is the metropolis of England*, that is said concerning the word *London*, which is intended concerning the thing signified by that word. Thus the expression is not less philosophical than poetic, "*Quosque secans infaustum interluit Allia nomen.*" (*Æn.* vii. 717.)

Lastly, a Word is an arbitrary sign. It acquires its signification only from mutual compact. There

is not any natural fitness in the sounds or forms which constitute any word (except in some few which are formed by imitation) to express either the idea or the object to which that word is appropriated. Hence in different languages different words convey the same meaning; as, ἔπος, *verbum, mot, word*; τέλος, *finis, fin, end*; Γαζα, θησαυρός, *treasure*. The same words also convey different senses; for instance, the combination of forms constituting the word *pain*, is not less adapted to convey to a Frenchman the notion of *bread*, than to excite in *our* minds the thought of *uneasiness*. The sounds composing the word *lego* form as efficient a representative of *I read* or *I cull* in Latin, as λήγω is in Greek of *I cease*. For this reason also, even in the same language, different words express very nearly the same ideas; as, *pugna, prælium; hostis, perduellis; vote, suffrage*: while on the contrary the same word bears different, and sometimes opposite senses; as, *leasing*, i. e. *gleaning*, or *falsehood*; *to let*, i. e. *to permit*, or *to hinder*.

Even words derived from imitation, as *cuckoo, crash, βόμβος*, require the authority of custom to constitute them legitimate words.

Each language moreover possesses some words to which there are no correspondent expressions in another. Of this kind are the French word *ennui*; the Latin *colo*; the Greek λόγος, ἐκκλησιαστικός; the Persian *parasang*; the English *parliament*. Such combinations of ideas can be expressed in other languages only by adopting the foreign word, or by circumlocutions, or by approximation.

Jam quæ simplicem Apprehensionem exprimit, *Vox simplex* est; quæ Judicium, *Complexa*; quæ Discursum, *Decomplexa*. Nam argumentum omne resolvitur in tres *Propositiones*, sive *sententias*, et *propositio* omnis complectitur

voces, non semper numero, sed sensu semper tres; 1. *Subjectum*, sive de quo aliud dicitur. 2. *Prædicatum*, sive id quod dicitur. 3. *Copulam*, quæ utrisque media intercedit. Nam Subjectum et Prædicatum quoad sensum semper extrema sunt, et vocantur ideo *Termini Propositionis*.

1. Any combination of grammatical words which represents one act of compound or complex Apprehension is logically to be considered as a *simple word*. Thus, *He that is of a proud heart; A stirrer up of strife; The single consideration of the progress of a finite spirit towards perfection; A consideration sufficient to extinguish all envy in inferior natures and all contempt in superior;* are respectively simple words.

2. The act of judgment requires the previous apprehensions of two objects; to which the mind adds a third act of apprehension, while it decides on their agreement or disagreement. Consequently the form of language necessary to express the operation of judgment must consist of three simple words; which together constitute one *complex word*. Such are the following propositions; in which the subject, copula, and predicate, are separated by an obelisk; and the grammatical words which express a single complex apprehension (and which thus constitute one logical simple word) are united by hyphens.

He - that - is - of - a - proud - heart † is † a - stirrer - up - of - strife.

The - single - consideration - of - the - progress - of - a - finite - spirit - to - perfection † is † a - consideration - sufficient - to - extinguish - all - envy - in - inferior - natures - and - all - contempt - in - superior.

The - man - that - walketh - not - in - the - counsel - of - the - ungodly - nor - standeth - in - the - way -

of - sinners - nor - sitteth - in - the - seat - of - the - scornful † is † blessed.

The - ways - of - wisdom † are † ways - of - pleasantness.

Pleasure - and - pain - together - with - their - causes - good - and - evil † are † the - hinges - on - which - our - passions - turn.

The Copula is often grammatically combined with a part of the Predicate. Thus, in the proposition, *The way of the wicked † shall be darkness*, the word *shall-be* not only denotes the simple notion of the Copula, which expresses agreement, but comprehends also the idea of futurity. The proposition may be resolved thus: *The way of the wicked † is † a way which shall be darkness; or, a way tending to darkness.* A similar combination occurs in the following instances:

SUBJECT. COPULA AND PREDICATE.

Litera scripta manet.

A sudden question . . takes a man by surprise.

A prudent man . . . foreseeth the evil.

Darkness at his bidding fled.

As to the sense, the Subject is always the first word in a sentence, and the Predicate the last. They are however often reversed in the actual arrangement: as,

I that region lost. Sweet is the breath of morn.

Not absolutely vain is human praise,

When human is supported by divine.

Strait is the gate, and narrow is the way, that leadeth unto life.

It is dishonest and contemptible to use equivocation.

It is expedient to treat strangers with reserve.

Finitima sunt falsa veris.

Minime sibi quisque notus est.

Una salus victis nullam sperare salutem.

Οὔτοι κρείττοις ἕκαστα γίνονται, οἳ ἂν ἀφήμενοι τοῦ πολλοῖς προσέχων τὸν νοῦν, ἐπὶ ἐν ἔργον πρᾶπανται.

Causa et radix fere omnium malorum ea una est, quod dum mentis humanæ vires falso miramur et extollimus, vera ejus auxilia non quæramus.

The apparent or grammatical subject is not always the true logical subject. Thus in the proposition, *That desire is a state of uneasiness every one who reflects on himself will quickly discover*; the apparent subject is *every one who reflects on himself*, and the predicate (with the copula) is, *will quickly discover that desire is a state of uneasiness*. But the sense of the passage requires us to consider the fact, *that desire is a state of uneasiness*, to be the true subject; of which it is predicated that it is *quickly discoverable by every one who reflects on himself*. Again, in the sentence, *Parva leves mentes captant*, the grammatical subject is *parva*, and the remaining words constitute the copula and predicate. But the poet did not intend to assert concerning *trifles*, that they have a tendency to *captivate weak minds*; but rather to predicate of *weak minds*, as his subject, a liability to *be captivated by trifles*. In deciding on such propositions, the context and the general tenor of the argument must usually be our guide.

3. The process of syllogistic reasoning requires the previous operation of two judgments; from which a new agreement or disagreement is inferred. Hence it cannot be *fully* expressed by fewer than three sentences. Thus, in inferring the immortality of the soul from its immateriality, or the spherical form of the earth from the appearance of its shadow, the mind carries on a process to this effect: It previously acquiesces in the judgment, that *Every thing immaterial is immortal*; or, that *Every substance which, in whatsoever position it be, casts a circular shadow, is spherical*. It then assumes, in the former case, that *The soul is immaterial*; in the latter, that *The earth is a substance which, in whatever position it be, casts a circular shadow*. Whence it proceeds to the third judgment, namely, that *The soul is immor-*

tal; or, that *The earth is spherical*. This entire process expressed in language is logically called a *decomplex*, or doubly complex word.

Atque hinc adeo vulgo dicitur Pars prima Logicæ versari circa *Terminos simplices*, i. e. voces simplices, Apprehensionem simplicem exprimentes: secunda circa *Propositionem*, sive Vocem complexam, quæ Judicium exprimit: tertia vero circa *Syllogismum*, sive Vocem decomplexam, quâ Argumentatio sive Discursus exprimitur.

For Logic bears upon its ultimate object, the faculties and functions of the mind, through the medium of language; which is therefore to be considered as its immediate object.

The three branches of Logic here enumerated have been slightly touched upon, by anticipation, in the preceding paragraph. A more full exposition of each follows.

§. 3. *De Nominum Divisionibus.*

PRIMA igitur pars Logicæ versatur circa *Terminos Simples*; i. e. ejusmodi voces, quæ solitariæ in propositione prædicari vel subjici possunt; et vocantur ideo *Categorematicæ*, ut *homo, lapis*. Quædam etiam vocabula sunt tantum *Syncategoremata*, sive compartes subjecti aut prædicati, ut *omnis, nullus*; Quædam etiam mixta, ut *semper*, i. e. omni tempore; *nemo*, i. e. nullus homo; *currit*, i. e. est cur-

rens; quo etiam modo verbum omne grammaticum resolvi potest.

Verbum igitur Logicum (nempe *purum*) præter Copulam nullum est: cætera ex participio et copulâ coalescunt.

1. *Simple Terms* or *Categorematic Words* are those words which may be used *alone* either as the subject or the predicate, in a proposition.

A simple term therefore must be a substantive in the *nominative case*; either by itself, or constituting with its adjuncts one simple logical word. Thus in the proposition, *Nobilitas sola est atque unica virtus*, the word *virtus*, by itself, constitutes the subject; the substantive *nobilitas* with its adjuncts, (in other terms, the logical word *nobilitas-sola-atque-unica*,) constitutes the predicate. These are therefore two simple terms.

In the sentence, *Virtus est vitium fugere*, the word *vitium-fugere*, which is the subject, and the word *virtus*, which is the predicate, are both simple terms. For the subject *vitium-fugere* is truly a noun substantive in the *nominative case*. Again, in the proposition, *I am happy*, the two simple terms are *I*, which is the representative of a substantive in the *nominative case*; and *a-happy-man*, which is implied in the elliptical form, *happy*.

2. All Adjectives and Participles are *Syncategoremms*; since they can, in sense, form only a part of a subject or predicate. For they necessarily require a substantive, either expressed or understood. In the sentence, *Music is delightful*, the adjective *delightful* does not constitute the predicate. The actual term is incomplete; and should be expressed thus, *a delightful thing*. *Man is frail*; i. e. *a frail being, or creature*. *The king was astonished*; i. e. *a person astonished*.

Substantives in the oblique cases are also *Synecategorems*, as, *Pecus est Melibæi*; i. e. *Pecus est pecus-Melibæi*. *I yield to my betters*; i. e. *I am a-person-yielding-to-my-betters*.

3. *Mixed words* may be formed by the combination of two syncategorems, as in the first instance given in the text; or of a categorem and a syncategorem, as in the second instance: or of the copula and a syncategorem, as in the third example.

In the sentence *sic vita erat*, the word *sic*, which belongs to the first class of mixed words, stands elliptically as the representative of the predicate: *His course of life was a-course-of-life-conducted-in-this-manner*.

The mixed words of the second class (formed by the combination of a categorem with a syncategorem) are themselves also categorems or simple terms. Thus *nemo* is a mixed word, because it is formed of *nullus* and *homo*: but it is a simple term, because it may be the subject of a proposition. Thus again the words, *consideration*, *progress*, *spirit*, *perfection*, are in themselves categorems; whereas, the words *this*, *single*, *finite*, &c. cannot be any other than syncategorems. But the mixed word, *This single consideration of the progress of a finite spirit to perfection*, is also a categorem; and the less complex terms which form a part of it are, when taken in connexion, reduced to the rank of syncategorems.

The third class of *mixed words* comprehends all grammatical verbs, except the substantive verb in the indicative mode and present tense, which simply denotes unqualified existence, divested of all notion of time or mode. Thus, *I stand*, logically resolved, denotes *I am standing*; and, by the completion of the predicate, *I am a person standing*.

Nomen Logicum, est Terminus simplex sine tempore significativus. Nam ex antedictis,

Terminus simplex idem valet atque vox articulata et recta, et ex instituto significans; siquidem exclusæ sunt voces inarticulatæ, quasque natura sponte suggerit; voces autem obliquæ sunt Syncategoremata.

Logical Nouns are equivalent to *Simple Terms*, or *Categorems*. They are *significative*: in opposition to adverbs, prepositions, conjunctions, &c. which have no actual signification, but merely unite into one sentence the words with which they are connected, or qualify them, or denote certain relations which subsist between them. They *do not express time*: and thus are distinguished from verbs, which, by the changes of terminations or by the help of auxiliaries, denote time past, present, and future.

The definition of a *Logical Noun* given in the text is not accurate. It appears to imply that the *Noun* is a *kind of simple term*, distinguished from other kinds of simple terms by the adjoined qualities, *significant*, and *inexpressive of time*. Whereas in fact these qualities are essential to a *simple term*; and the two, instead of being related to each other as a part to the whole, are exactly equivalent in signification. A *Logical Noun* may be defined *A significant word, inexpressive of time or relation*. The additional limitation, *inexpressive of relation*, excludes both adjectives and the oblique cases of substantives.

The word *recta* in the text, applied to *vox*, is used in the grammatical sense, in contradistinction to the subsequent expression *voces obliquæ*. The ancient grammarians represented the natural form of a noun as being *erect* or *upright*; and the various modifications which the noun undergoes in government, as *fallings-off*, (*casus*,) or *declensions* from that erect form. Hence *vox recta*, or (by a strange confusion

of metaphor,) *casus rectus*, was adopted to denote the primitive form or *nominative case*; while the epithet *obliquus* was attached to the governed cases; that is, to all the other cases except the vocative.

Nouns in the vocative case cannot fall under logical rules; for they form no part of a sentence. Mere sounds of imitation, and natural exclamations are for the same reason excluded.

Multæ sunt Nominis Divisiones; quarum tres sufficiunt hujus loci instituto; sed ob multiplicem earum usum, quinque alias adjungam.

1. Nomen *singulare*, est quod rem unam et solam significat, ut *Socrates: Commune*, quod plura, et eorum singula significare potest, ut *homo*.

Every word which expresses an individual object is a *singular noun*.

All *Proper Names* are therefore *singular nouns*, as *London, England, the Thames, Adam, George, Aristotle, Alexander, Sirius, Arcturus*.

Common or appellative nouns become *singular*, when a sign or syncategorem is so combined with them as to limit their signification exclusively to one object: as, *The King. My eldest brother. The noble Lord that spoke last. The first man who ever ventured on the ocean*.

A *Common Noun* in Logic is generally equivalent to a *common or appellative noun* in Grammar. The term however is applied not only to single grammatical words, but to such combinations of words also as express a general idea.

The name *Man* serves to represent the whole class of mankind collectively; but each individual of the human race is with equal correctness deno-

minated a man. The word *Rectilinear Figure* signifies a class consisting of many individual things; and the same word is employed to designate each of those things individually.

Singular nouns are sometimes employed (not logically, but figuratively) as *common* nouns. As;

The CICERO of his day.

Some village HAMPDEN, that with dauntless breast

The little tyrant of his fields withstood;

Some mute inglorious MILTON here may rest;

Some CROMWELL, guiltless of his country's blood.

2. *Finitum*, est cui abest particula *non*: *In-finitum*, cui præfigitur: ut, *non homo*, i. e. omnia præter hominem: unde particula *non*, dicitur *infinigans*.

The proper English terms which express this division of nouns are *Definite*, and *Indefinite*.

By prefixing the negative particle the expression is rendered (not *infinite*, but) *indefinite*. If it be predicated of any thing that it is *not a book*; that one thing, *book*, alone is excluded, while it continues wholly *undefined* what other thing the subject thus spoken of may be.

A definite noun and its corresponding indefinite noun together constitute a perfect division or dichotomy. Thus, all animals are either *rational*, or *not-rational*; all created things are either *sentient* or *non-sentient*; *corporeal* or *incorporeal*; all men are either *virtuous* or *not-virtuous*.

3. *Positivum*, est quod significat rem quasi præsentem: *Privativum*, quod dicit absentiam rei a subjecto capaci: *Negativum*, quod ab incapaci. Sic *homo* est vox *positiva*; *videns* dici-

tur de homine *positive*; *cæcus* de homine *privative*; *cæcus*, seu potius *non videns*, de lapide *negative*.

This and the following divisions denote not so much distinct kinds or classes of nouns, as different uses or applications to which words are subject.

In the sentence, *The satellites of Jupiter are visible through a telescope*, the word *visible*, as well as the other terms employed, are used *positively*. In the sentence, *The moon is occasionally invisible*, the word *invisible* is used *privatively*, and the predicate, *an invisible thing*, is a *privative noun*; because it expresses the absence of *visibility* from *the moon* which is capable of *being seen*. But when it is said, *The human soul is invisible*, the word *invisible* is *negative*, inasmuch as it is predicated of a subject incapable of *being seen*.

The following are examples of *Positive*, *Privative*, and *Negative* Words.

- | | | |
|------------|---|-----------------------------|
| Positive, | A living man. | <i>Pleasant</i> society. |
| Privative, | A dead man. | <i>Unpleasant</i> sounds. |
| Negative, | A lifeless corpse. | <i>Unpleasant</i> sarcasms. |
| Positive, | A man of feeling. | A mortal body. |
| Privative, | An unfeeling wretch. | <i>Immortal</i> fame. |
| Negative, | The senseless rock. | A soul <i>immortal</i> . |
| Positive, | A fruitful vine. | A fruitful treatise. |
| Privative, | An unfruitful vine. | A fruitless search. |
| Negative, | The unfruitful elm. | Fruitless anxiety. |
| Positive, | A man of great merit. | |
| Privative, | The demerit of our works. | |
| Negative, | The demerit of sin. | |
| Privative, | The measure proposed was <i>unconstitutional</i> . | |
| Negative, | Every infringement on the prerogative of the crown is <i>unconstitutional</i> . | |

A rational man may be guilty of irrational conduct.
The irrationality of brutes is inherent in their nature.

Telum imbellis sine ictu.

As uncertain as the wind.

The debt immense of endless gratitude.

It frequently occurs that the same word may, under different points of view, be considered either as positive, or as privative or negative. Thus *mortal* is positive, in reference to *immortal*, its privative or negative. But *immortal* may be understood as *positive*, in contrast with *perishable*. Again, *death* is the *privation* or *negation of life*: but it may be accounted *positive* as opposed to *deathless*. Words may often be variously classed, as we consider their signification or their formation, as, *wicked, unholy; unhappy, wretched; impure, filthy.*

4. *Univocum*, est cujus una significatio æque convenit multis, ut *homo*. *Æquivocum*, cujus diversæ, ut *Gallus*: *Analogum*, cujus una inæqualiter, ut *pes*.

Two essential characteristics are to be noticed in each of these definitions; namely, *the number of the significations*, and *the application of those significations to the things signified.*

An *Univocal* word has *one* signification only: and in that one signification it is *equally* applied to many things.

An *Equivocal* word has *more than one* signification: and in each of its significations it is said to be *equally* applicable to many things.

Analogous words have only *one* signification: but in that one signification they are *unequally* applied to many things.

An *Equivocal* word is in each of its different significations a distinct common term. The coinci-

dence in sound, or sense, or both, is merely accidental; and is a great imperfection in language. It is probable that no language is exempt from this evil: but it abounds to a great extent in the English. This is indeed a natural consequence of the variety of sources from which our words are derived. For a difference of origin is the chief occasion of equivocal words. The following are examples:

Ὀὔρος: favourable wind; guard; buffalo; boundary; mountain. *Ὀυρός*: trench; whey.

Ἴός: a dart; poison. *Βίος*: life; *βίος*, a bow.

Ἄλημα: (from *ἀλάομαι*) vagrant: (from *ἄλω*) flour.

Jus; law; broth.

Malus; (masc.) mast of a ship: (fem.) an apple tree.

Tempus; time; temple of the head.

Vestis recincta; i. e. discincta, or, succincta. (*Æn.* iv. 518.)

Club; a heavy stick; a society.

Mail; a post-bag; armour.

Tract, (tractatus); a small book.

— (tractus); an extent of country.

Ounce; a legal weight; a species of animal.

Pound; a legal weight; an inclosure for beasts.

Palm; a species of tree; the interior of the hand.

Page; side of a leaf in a book; an attendant.

Mast; fruit of the beech; erect timber in a ship.

Ear; the organ of hearing; a spike of corn.

Bill; a fowl's beak; a written account.

Meal; a repast; flour.

Nail; horn on human fingers; spike of metal.

And at one *bound* high overleapt all *bound*.

Some words are equivocal to the eye alone, as *mora*, (delay, mulberries:) *mala*, (a jaw, misfortunes:) *sole*, *soul*. Others to the ear alone, as, *heir*, *air*: *hair*, *hare*.

Proper or *Singular* Nouns may be considered as partaking in some measure of this *equivocal* quality.

The name *Thomas*, for instance, is applied to those who are so called, not as to individuals of the same class or bearing any common character intended by that name, but in a manner wholly arbitrary and independent.

Analogous Nouns have primarily but one signification. From that signification, as a common source, flow a variety of particular applications. For, of the aggregate of ideas represented by the term in its original use, sometimes one portion and sometimes another is discarded, a few only of the leading ideas being retained. Thus the words become appropriated in a modified and subordinate sense to objects which bear no more than an analogy or similarity to their original application. For example :

Sacramentum; a military oath; a Christian sacrament.

Judgment; a faculty and an operation of the mind; legal decision; critical taste.

Intention; the state of being strained; purpose; close attention; application of a word.

Sting; of an animal; of conscience; of an epigram.

A religious person; a man of piety; a person set apart by religious ceremonies, or for religious purposes.

College; the corporate society; the building which contains the society.

Τιμή; honour; punishment; i. e. the conferring on each their due.

Æquor; a plane; the earth; the sea.

Ἀκολασία. ἡ περὶ τὰς ἡδονὰς ὑπερβολή.

— αἱ παιδικαὶ ἀμαρτίαι.

A bitter draught; foe; fate; sarcasm; frost.

A sour taste; a *sour* look; *sour* adversities.

Κλείς; a key; a collar-bone (from the shape.)

Ὠρα; time; season; period of life; personal beauty.

Fall; the act of dropping; moral or political degradation; the autumn; diminution in price; musical cadence; declivity.

Justice; social right; punishment; the administrator of social right or legal punishment.

Heat; caloric; the sensation produced by caloric; a violent effort; sudden anger.

A *vein* of the body; of metal; of poetic feeling.

It was a *sight* worth seeing; but my *sight* is so imperfect, that I could not get a distinct *sight* of it.

Cicero uses the following expressions within the space of fifty lines in the first book of the Offices:

Institutio quæ a ratione suscipitur: (reason.)

Ratio probabilis: (reason or account.)

In rationem utilitatis cadit: (head or division.)

Ratio triplex: (plan or classification.)

Pari ratione: (manner.)

In the same work he has the expressions,

Omnis ratio debet vacare temeritate: (course or system of conduct.)

Quibus rationibus: (by what means.)

Ratio negligendæ mortis: (the principle.)

So again in the course of one chapter we find these various uses of the word *contentio*:

Altera contentionis, altera sermonis: (of public speaking.)

Sine contentione vox: (without straining or vehement effort.)

Contentiones aliorum: (public speeches.)

There are indeed very few words which are not *analogous*; probably none, except those which have never come into general use, but have been wholly confined to some philosophical or technical application. Our *notions* are infinitely more numerous than our *words*; each of these must therefore represent many of the former. To invent a new word for every new apprehension would be

impracticable; or, if practicable, would defeat its own purpose. Hence we must use words approximating in signification to the new ideas which we desire to express. In judging of this approximation, not only the illiterate, but philosophers have often erred. Yet the words which custom has established, though philosophically erroneous in the analogical application, must be retained; while they render a particular effort of the mind necessary, to guard itself against adopting the false principles on which the use of them was originally founded. The metaphysical terms *perception*, *form*, *idea*, afford instances of this erroneous process. So the Hindoos use the same word *copal* to signify *the forehead* and *destiny*: a fancied analogy derived from their notion that all the future actions and events of the life of every individual are written invisibly on his forehead soon after his birth.

It is not accurate to assert that equivocal words have their significations *equally* agreeing with the several objects to which they are applied. They are to be considered, in each signification, as so many distinct common nouns, liable to be employed in every variety of *analogy* which these significations may admit.

The same words are therefore both equivocal and analogous: for instance,

Post; a swift or periodical messenger; an expeditious mode of travelling.

Post; a piece of timber set erect; a military station; office or duty; a stupid fellow.

Case; (casus,) state of circumstances; grammatical variation of nouns.

Case; (caisse,) chest, box, exterior covering.

Bull; the animal; a violent enemy; sign of the zodiac.

Bull; the pope's official letter; an absurdity.

Foot; the part on which we stand; that which supports any thing; the lower part.

Foot; a measure of length; a certain number of syllables in a verse.

Probably all these significations of the word *foot* are derived from analogy. But when the analogy is not obvious, the several senses are often considered independent of each other, and the word is classed as equivocal. Thus it may be doubted whether the different significations of κόσμος and *mundus* were attached to those words by a merely accidental coincidence, or whether they originated in any supposed analogy. On the other hand, some words which are really equivocal have an apparent approximation in sense which occasions them to be mistaken for analogous words: as, *tale*, a narration, or, a reckoning; (derived from two distinct Saxon words:) *priest*, as used in the totally different significations of ἱερεὺς and πρεσβύτερος.

Every word becomes strictly *univocal* when it forms a part of a clear and definite sentence; the aggregate of ideas which it is intended to represent being fixed by the connection in which it stands.

5. *Concretum*, est quod rem quasi suâ naturâ liberam exprimit, sed jam implicitam subjecto, ut *Justus*: *Abstractum*, quod rem quasi suâ naturâ nexam, sed jam subjecto exemptam, ut *Justitia*.

The notions expressed by *Abstract Nouns* are acquired by a process of this nature. The primary sensations of our mind are excited, (if not universally, at least so far as the present distinction is concerned,) by individual external objects discerned by the bodily senses, or by individual acts of internal reflection: such as those expressed by the words, *brother*, *philosopher*, *green field*, *accurate judgment*. We discover that these objects excite not

simple but complicated notions ; that they consist of some subject combined with certain qualities, or modes of existence. These, by a natural operation of the mind, we resolve as distinct parts ; separating from each other the notion of the subject, (as, *man, field, judgment,*) and that of the adjoined quality, (as, *fraternity, philosophy, greenness, accuracy.*) Thus we consider the quality as if *naturally adhering* to the subject in which we first discovered it, and now separated or *abstracted* from it in imagination only. The word which represents the notion of a quality thus acquired is called an *Abstract Noun*.

This mental separation of the quality from the subject to which it actually adheres may be effected if we have never had more than one object containing that quality presented to our apprehension. But the operation is both facilitated, and rendered more correct, when we have the opportunity of comparing many different things in which the same quality is discoverable. Thus if we derived our notion of *heat* only from *the sun*, we might be led to consider *radiance* and *celestiality* as essentials to that quality, and to admit those ideas as parts of the aggregate denoted by the abstract word *heat*. But when we find the same quality existing in *culinary fire*, without the latter adjunct ; and produced by *friction* without the former ; we learn to separate it from those notions, and to employ the abstract term simply to denote that quality by which a certain natural sensation is produced.

The word expressing the object of sense or of mental apprehension from which this process of abstraction originates (as, *brother, philosopher, green-field, accurate-judgment*) is sometimes called *connotative* ; intimating that we arrive at once at the knowledge of the subject, and of the adherent quality.

The term *Concrete Noun*, though usually employed simply as the opposite to *abstract*, refers to

a supposed process of the mind exactly the reverse of that just described. If we can conceive our mind to be unconnected with the body, and endued with an instantaneous and intuitive knowledge, we may suppose it to commence its operations with the notion of the simple quality itself, not as abstracted from any subjects, but as if it naturally and primarily existed in a distinct, absolute, and independent state. The mind may then be considered as proceeding to apply those qualities to particular subjects; as, to *man, field, judgment, fire*. The terms expressive of those combinations of ideas (as, *brother, philosopher, green, accurate, hot*) are called *concrete words*.

As our abstract notions are the mere productions of the mind, without any correspondent *thing* in nature, the latter must be considered as only an imaginary process, the former as the actual process.

Abstract notions are usually expressed by substantives, as *holiness, virtue, philosophy, similarity, fraternity, royalty, ἀδικία, δικαιοσύνη*. *Concrete* notions are usually expressed by adjectives, or by attributive substantives; as, *holy, virtuous, philosopher, similar, brother, king, ἀδίκημα, δικαίωμα*.

The same word often represents both the abstract and the concrete notion; as, *Truth lies in a well. One truth is clear*. The one is also frequently employed figuratively for the other: *Involving truth in obscurity* is more philosophically as well as poetically expressed, *Obscuris vera involvens*. (*Æn.* vi. 100.)

6. *Absolutum*, est quod significat rem per se sumptam; *Relativa*, quorum conceptus se mutuo ingrediuntur, ut *Pater et Filius*.

An *Absolute Noun*, as opposed to a *relative* noun, (for the word is employed by logicians in different senses,) denotes a term the sense of which is com-

plete in itself. But a *relative* noun expresses an idea which cannot be apprehended unless we have at the same time a notion of its correlative. Thus *father* implies the notion of *son*; and *son of father*. Such are also *cause* and *effect*; *whole, half, double, treble*; *great, small*; *swift, slow*; *genus, species*; *high, low*; *king, subject*. Correlatives have often the same name; as *friend, enemy, companion, opposite, equal, brother, cousin, comrade*.

7. *Convenientia*, sunt quæ possunt de eodem simul dici, ut *doctus et pius*: *Repugnantia*, sive *Opposita*, quæ non possunt, ut *album et nigrum*.

Qualities may be predicated of the same subject at *different* times, which notwithstanding are *opposite*, or *inconsistent*: for example, The wall which to-day is *white*, may to-morrow be *black*.

Relative terms are *opposite*, when their subject is the same. To be *father* and *son* of the same individual is impossible. That which is *half* of one quantity may be the *whole* of another: but *half* and *whole* are opposite, or inconsistent, if applied in relation to the same quantity.

Contrary words are *opposite*, or *inconsistent*; as *truth, falsehood*; *happiness, misery*.

Such also are a *positive* and a *privative*: as *harmonious, unharmonious*.

But the strongest and most complete *opposition* of simple terms subsists between a *positive* and a *negative* word; or a *definite* and *indefinite* term: as, a *feeling* man; an *unfeeling* rock; he is a *hero*; he is *not a hero*.

8. Nomen *Primæ intentionis*, est Vox in communi usu posita. *Secundæ*, Vox artis, quam

ex communi sermone sumptam Philosophia recudit denuo et moderatur.

A distinction must be made between the logical and the etymological signification of the terms *primary* and *secondary intention*. In Etymology, the primary sense is that which was prior in point of time, or which most nearly approaches to the meaning of the root whence a word is derived : and every variation from that sense is a secondary meaning.

But in Logic, the vague colloquial signification is called *primary*: the strict philosophical appropriation of the word is called the *secondary intention*. Hence, so far as we converse logically and correctly, every word we use will be of *secondary intention* ; that is, applied in a strict and definite sense.

The following instances will serve to illustrate the distinction between nouns of primary and secondary intention :

The attractions of good company.

The magnet has the power of attraction.

Attraction is the tendency of bodies to each other, without any apparent impelling cause.

Attraction in Chemistry is the tendency of substances, especially liquids, so to intermingle with each other as to become inseparable.

Attraction in Grammar is a figure by which a word is not constructed according to the usual rules of government, in consequence of the influence of some preceding word with which it agrees.

The Chancellor spoke with much animation.

The means of restoring suspended animation.

A lad of dull comprehension.

Comprehension, in metaphysics, is, rem aliquam totam et totaliter cognoscere.

Διαλεκτική the art of conversation ; logic.

Ὁρίζων any thing which limits ; the horizon.

'Ὁρός' a limit; a geographical boundary; the definition of a word.

'Ἐπίσκοπος' an overseer; a bishop.

'Ἀπόστολος' a messenger; an apostle.

Si mala condiderit in quem quis carmina; jus est Judiciumque. Esto; si quis mala: sed bona si quis Judice, condiderit, laudatur Cesare. (Hor.)

Here *mala carmina*, is playfully introduced both in its *secondary*, that is, its legal signification, *slandorous, libellous* verses; and in its primary or colloquial sense; *ill-written, poor, doggrel*.

Aristotle takes the word *πραότης*, *lenity*, from its common and *primary* sense, to signify *the due medium between the excess and defect of anger*; for which the Greek language did not supply an accurate term.

Delight, in its *primary* sense, denotes *a superior degree of pleasure*. But Burke employs the word to express *the sensation which accompanies the removal of pain or danger*. This then is a limited, new-modelled, philosophical, *secondary intention*.

In like manner every author has a right to appropriate any word to a new *secondary intention*; by strictly defining the whole number of ideas which he intends to represent by that word; and by afterwards adhering closely to the same use of it. Such a process is however never expedient, unless in a case of necessity. Locke has done this in regard to the word *judgment*, which he defines *The putting ideas together, or separating them from one another in the mind, when their certain agreement or disagreement is not perceived, but presumed to be so*. Professor Stewart and others have affixed a new *secondary* sense to the word *conception*; by limiting it to *That power of the mind which enables it to form a notion of an absent object of perception; or of a sensation which it has formerly felt*.

Xenophon represents that an officer at the table of Cyrus complained of some of his brother-officers,

because they had either invented or coloured the anecdotes they had been relating, for the purpose of exciting a laugh; and charged them with being *ἀλαζόνες*. Cyrus defends them by asserting that he misapplied that word by using it in too vague and extensive a sense. In the mouth of this officer it was therefore a word of *primary intention*. Cyrus proceeds to assign its secondary intention thus: 'Ὁ μὲν γὰρ ἀλαζὼν ἔμοιγε δοκεῖ ὄνομα κῆσθαι ἐπὶ τοῖς προσποιουμένοις εἶναι καὶ πλουσιωτέροις ἢ εἰσὶ, καὶ ἀνδρειότεροις, καὶ ποιήσιν ἂ μὴ ἱκανοὶ εἰσιν ὑπισχυόμενοις· καὶ ταῦτα, Φακεροῖς γιγνομένοις, ὅτι τοῦ λαβεῖν τι ἔνεκα καὶ κερθᾶναι ποιούσιν. Yet the sense in which the officer used the word coincides with that which Aristotle assigns as its *secondary* or *philosophical* signification: Δοκεῖ ὁ μὲν ἀλαζὼν προσποιητικὸς τῶν ἐνδόξων εἶναι, καὶ μὴ ὑπαρχόντων, καὶ μειζόνων ἢ ὑπάρχει.

§. 4. *De Prædicabilibus formandis.*

VOX Singularis, dicitur alio nomine *Individuum*, ejusque significatum *Unum numero*: neque enim singulare est quicquid Unum dici potest; sed multa, quæ sunt invicem similia, eatenus Unum censentur. Vocantur enim uno eodemque nomine; quod ipsa Vocis definitio non patitur, nisi in illis reipsâ sit, vel saltem concipi possit, una aliqua eademque Natura, quæ huic nomini respondeat.

Talem reperit intellectus, dum plura contemplando *abstrahit* ab eorum differentiis; i. e. spectat in rebus ea tantum quæ conveniunt, neglectis omnibus quibus dissident; adeoque

fundamentum omne discriminis, præter numerum, eximit. Quare naturam sic abstractam, cum sit omni singulorum differentiæ superstes, concipi par est, non ut in singulis diversam, sed ut in omnibus eandem; adeoque *Universale* quiddam sive *Ens unum in multis*: ejusque signum idoneum erit, Nomen *commune, univocum, secundæ intentionis*, uno verbo, *Prædicabile*, sive Vox apta prædicari, i. e. univoce dici de multis.

1. A *Singular word* is called an *Individual Noun*; borrowing that distinguishing epithet from the nature of the object which it represents; namely, a single or individual object. Such a term cannot be *divided*, either by classification, or by enumeration, because that which it signifies is only *numerically one*.

Every thing which actually exists is *singular*, and is therefore capable of being expressed by a singular sign or word. But these objects are so numerous, that it would be burdensome and useless to appropriate a distinct name to each.

It is found sufficient, therefore, to affix singular names to those things which occur most commonly as subjects of mutual communication; as, men, countries, cities, rivers, mountains, &c. On this principle a grazier has a particular name for each horse and cow he possesses, and an astronomer affixes a distinct denomination to every star. Thus also a singular name is invented for each house in a city, by joining to the name of the street or place in which it is situated, its particular number. In like manner, the descriptive expression, *the comet which appeared in the year 1825*, is a singular noun, and denotes an individual object.

2. Nouns are *common* or general, when employed as signs of abstract or general notions. And our notions become abstracted, when, upon comparing several individual objects with each other, and, discovering in them a variety of qualities in which they agree together, as well as several in which they differ, we lay aside the consideration of the latter, and retain and combine all and only those ideas, which are excited by the qualities in which they appear to coincide with each other. When we proceed, by a further mental process, to consider the abstract notion thus acquired, as indiscriminately and equally appropriate to the whole class of individuals from which it was derived, and all others which comprehend the same qualities, we are said to *generalize*. From the former process the aggregate of conceptions is denominated an *abstract* idea: from the latter it is called a *general* or *universal* idea.

This abstract or universal idea is expressed by a *sign* or *word* which is called *common*. And such a word, notwithstanding the many individuals to which it applies, is considered as a representative of *one* notion, or *one* object; otherwise it would cease to be an *univocal* term. For the notion itself, and the supposed subject of it, are no longer thought of as existing in a variety of things numerically different; but as being, to whatever individuals it is applied, still one and the same. That the *thing* supposed by that notion, the *αὐτὸ ἕκαστον*, the *universal* nature, really exists, is not to be conceived. No such thing as *abstract-man*, (*αὐτὸ ἄνθρωπος*,) *abstract-animal*, *abstract-colour*, *abstract-harmony*, independently of any particular modification and combination, can exist; we only imagine or conceive them to exist for the convenience of generalization and classification.

The process of the mind in abstraction may be thus more fully illustrated. An infant first attains the individual notions of its *father*, its *mother*, its

brother, its *nurse*, &c. In these it perceives, besides the characteristic attributes of each, certain qualities possessed by all as a kind of common nature. In process of time it sees other objects, in many respects similar to these. It lays aside the ideas of relationship, sex, dress, height, rank, &c. which distinguish the individuals from each other; and having thus framed to himself one idea, which is equally applicable to each, learns to denote that idea by the name *man*.

Again; we observe *horses*, *cows*, *lions*, *dogs*, *apes*, &c. (which are themselves also general or common words expressing ideas attained by abstraction from the individuals of each kind respectively;) and we discover in them several qualities common to them all. Renewing therefore the original process, we divest these classes also of their respective differences, and distinguish the notion comprehending all the qualities in which they are similar to each other, by the name *beast*. In the same manner have been acquired the notions denoted by the words, *bird*, *fish*, *insect*, &c. If again we compare *bird*, *fish*, *beast*, *insect*; by a similar operation of the mind, we arrive at the more abstract notion expressed by *brute*. But in all *brutes* we may discover certain qualities which likewise belong to our idea of *man*. Laying aside therefore the notions of *reason*, *speech*, and other differences, we retain only the ideas belonging to the common nature, viz. *body endued with life, sensation, and spontaneous motion*, which we call by the common name, *animal*. After having by continued abstraction obtained the idea of *animal*, and the idea of *plant*; laying aside the notions of *sensation*, *motion*, &c. and of *height*, *colour*, &c. and only retaining the notions of *body*, *life*, *nourishment*, *growth*, &c. which animals have in common with plants, we obtain the abstract idea to which we affix the common name, *living body*. By a similar process we

gain the idea of *body*, by dropping the notion of *life*, *growth*, &c. and retaining those of *separate existence*, *bulk*, &c. which belong to *rocks*, *metals*, *liquids*, &c. Thence, by the comparison of these objects with such others as are denoted by the words *soul*, *angel*, &c. divesting each of their characteristic properties, we form the still more abstract notion expressed by the term *substance*. And lastly, as the highest step, we compare *substances* with *qualities*, and laying aside the consideration that the one class can and the other cannot subsist independently of any other created object, we adopt the word *being*, *thing*, or *entity* to denote the one notion of pure existence, and apply that word to all the classes and individuals which *are*, or can be supposed to *be*.

A few other instances may be added in illustration of this operation of the mind. By abstracting from the individuals, *Socrates*, *Plato*, *Xenophon*, *Aristotle*, &c. the various circumstances in which they differ from each other; and viewing in combination all or the chief qualities or attributes which are common to them, we derive the general idea denoted by the common noun *Philosopher*. From *Homer*, *Pindar*, *Sophocles*, *Euripides*, &c. the idea of *Poet*. From *Parrhasius*, *Zeuxis*, &c. that of *Painter*. From *Herodotus*, *Thucydides*, &c. the idea of *Historian*.

From the particular impression on the eye, occasioned by the *green grass*, a *green cloth*, the *green in the rainbow*, &c. the mind derives the abstract idea of *Green*. From the comparison of *green* with *blue*, *red*, *violet*, *indigo*, &c. it derives the still more abstract notion of *Colour*. From *colour*, *light*, *taste*, *sound*, &c. that of *Passive Quality*. From *passive*, *habitual*, and *natural quality*, that of *Quality*.

From individual *triangles*, whether *right-angled*, *obtuse-angled*, *isosceles*, *equilateral*, *small*, *large*, &c. we acquire the abstract notion expressed by *Triangle*. From *triangle*, *square*, *rhom*b, *polygon*, *circle*,

&c. are acquired the idea of *Figure*. From *figure* and *form*, that of *Sensible Quality*. From *sensible*, *passive*, *natural*, and *habitual quality*, the general notion of *Quality*.

The imperfect exercise of this faculty of abstraction, as observable in children and savages, will serve more fully to illustrate its nature. A striking instance of it was afforded by two natives of New Zealand, who lately visited England. Having in their own country no quadrupeds except dogs, pigs, and rats, of which the first only are indigenous, and not having acquired any common name to comprehend those three classes of animals; they applied their name for dog (*caraddee*) at first to those two species which were new to them; and subsequently to every quadruped which they saw in England, as supposing them to be no more than particular variations of the same species. Upon further acquaintance, however, with the various kinds of animals, they adopted *caraddee* in a sense equivalent to *quadruped*, expressing the several species by adding to that word the English name of the animal. Thus they carried back with them to their own country the names, *caraddee-horse*, *caraddee-cow*, *caraddee-sheep*, as well as *caraddee-dog*: employing their old word to denote an idea more abstract, (that is, comprehending fewer simple ideas, and extending to a greater number of individuals,) than that which they had originally attached to it.

A similar process is observable in other languages. Thus the Greeks and the Romans, as they emerged from the state of barbarity, transferred the words *ἀρετή* and *virtus*, from their original application, in which they denoted the only moral excellence they acknowledged, viz. *manliness*, or *courage*, to a more abstract sense, including *every moral excellence*: that is, to speak technically, the word at first indicative of the *species* became appropriated to the *genus*. So *δικαιοσύνη*, originally applied to *distri-*

butive justice, subsequently acquired a more abstract application to *universal virtue*; *goodness*, which probably was first employed to denote *benevolence*, has gradually acquired its present more extended sense.

There are many words in the use of which we may trace an opposite process, the more abstract and extensive term having subsequently acquired a less abstract signification, by the addition of some new ideas to those which it originally comprehended. We have examples of this in the words, *passion*, when applied to *anger*; *charity*, applied to *alms-giving*; *lust*, as applied to *impure desire*; *affection*, as applied to *love*.

The process of the mind previously described for the purpose of illustrating the origin and nature of *abstract nouns*, is of the same nature as that which is here more fully developed. Every abstract notion might, if it were thought necessary, be distinguished by a corresponding abstract noun. Thus we might use the terms *animality* and *man-ness*, to denote the abstract notion, which we acquire from the concretes or connotatives, *animal* and *man*. The general adoption, however, of such words would be cumbersome and needless.

The word which represents an abstract or generalized notion has been shewn to be *common* and *univocal*. Since the ideas attached to it become, by this process, limited in a philosophical and correct manner, it is also a word of *secondary intention*. And because it is capable of being affirmatively predicated or asserted of all the individuals from which the idea of the universal nature has been derived, it acquires also the denomination, *Predicable*.

§. 5. *De Speciebus Prædicabilium.*

PRÆDICABILIMUM capita constitui et definiiri possunt ad hunc modum. Quicquid in

multis reperiri potest, vel est tota eorum essentia, vel ejus pars, vel cum essentiâ conjunctum. Quare Universalia vel (quod eodem redit) Prædicabilia sunt quinque, et non plura; videlicet, *Genus*, *Species*, *Differentia*, *Proprium*, *Accidens*.

Nam 1. *Genus* est quod prædicatur de pluribus ut eorum essentiæ *pars materialis* sive communis; ut *animal*. 2. *Differentia*, quæ ut essentiæ *pars formalis* sive discretiva; ut *rationale*. 3. *Species*, quæ ut tota essentia; ut *homo*. 4. *Proprium*, quod ut essentiæ junctum necessario; ut *risibile*. 5. *Accidens*, quod ut essentiæ junctum contingenter; ut *album*, *nigrum*, *sedere*.

The process of abstraction, and the use of common nouns, are subordinate to that arrangement and classification, without which our absolute knowledge could not be applied to much practical advantage. But this classification may be carried still further; and the mind discovers amidst the mass of abstract notions which it acquires, certain distinguishing qualities, which may form the ground of a convenient and complete arrangement of them under distinct heads. Many outlines for such a classification have been suggested. But that which has been generally adopted as most convenient in practice, is the fivefold division into *Genus*, *Difference*, *Species*, *Property*, and *Accident*.

The reflecting mind discovers that the general notions it has formed bear certain relations to each other. If it conceives of some imaginary common

nature as an *entire and independent essence*, (as, *Man, Triangle, Anger*,) it cannot but observe also that this supposed essence is composed of *parts*; that is, that the notion of it may be resolved into more simple and more abstract notions: for instance, the idea of *man* resolves itself into those of *animality* and *rationality*; *triangle* into *plane-figure* and *the quality of having three sides*; *anger* into *mental-perturbation* and *the experience of supposed injury*. The mind further perceives that there are other abstract notions of qualities *joined to the primary essence*; *risibility, tallness, nobility, to man*; *the having three angles, the being equilateral, to triangle*; *the desire of revenge, the being vehement, or suppressed, or long-continued, to anger*.

Hence originates the leading arrangement, which is threefold; the *essence, the part of the essence, and the quality joined to the essence*. The essence consists of two *parts*; of which *one* is *common to it and to other essences*; as *animality* is common to *man and brute*; *plane-figure* to *triangle, circle, square, &c.*; *mental-perturbation* to *anger, envy, hatred, pity, love, &c.* The *other* is *peculiar to the essence, distinguishes it from all others, and forms it that which it is*: as *rationality* distinguishes *man* from all other *animals*; *the having three sides* distinguishes the *triangle* from all other *plane-figures*; *the excitement by supposed injury* distinguishes *anger* from other *passions*.

But the *quality joined to that essence which is supposed to be the subject of an abstract notion* may also be twofold: as being either *necessarily or contingently* joined with it. Thus with *man*, the idea of *risibility* is supposed to be *necessarily* joined; those of *nobility, poverty, tallness, &c.* are only *contingently* joined: with *triangle*, the *having three angles* is *necessarily*, the being *equilateral or isosceles*, is *accidentally* joined: so also *the desire of revenge* is considered to be *necessarily* joined with *an-*

ger ; the being *vehement*, or *lasting*, or *excessive*, is *accidentally* joined with it.

Such is the foundation of the metaphysical division of abstract ideas and universal natures into the five classes above enumerated. And hence also the correspondent logical division of common nouns or predicables, distinguished by the same terms: namely,

The *Species*, which expresses the whole essence of the supposed common nature equally existing in many individuals.

The *Genus*, which expresses the common or material part of the essence.

The *Difference*, which expresses the distinguishing or formal part of the essence.

The *Property*, which expresses that which is necessarily joined to the essence.

The *Accident*, which expresses that which is contingently joined to the essence.

Patet hinc 1°. De iis dici *Prædicabile* quibus *inest Universale*. *Genusque* adeo, quod est plurium essentialium vel specierum pars communis, de *specie differentibus*, h. e. de diversis speciebus quas ingreditur, dici; ut *animal* de *homine* et *bruto*. *Speciem* vero, de *numero differentibus*, h. e. de diversis individuis, quorum singula habent essentiam speciei vocabulo significatam; sic *homo* de *Socrate* et *Platone* dicitur, et de omnibus, quibus natura *inest* humana. Reliqua vero *Prædicabilia*, (prout inferius patebit) eâdem de causâ, tam de specie quam numero differentibus dicuntur.

The Predicables belonging to each of these five classes are predicated (or asserted in the same sense) of many things; namely, of all those objects in which a nature corresponding with the notion represented by the word is supposed to exist.

The terms which belong to the class of *Genus* express common natures derived not immediately from the comparison of individuals, but from the comparison of several classes or *species* already formed by abstraction from individuals; whence they are technically said to be predicated of things *differing in species*.

Those which belong to the class of *Species*, since they represent the general or common notion of some abstract nature conceived to exist in a number of different *individuals*, are said to be predicated of things *differing in number*.

Those which come under the heads of *Difference*, *Property*, and *Accident*, are said to be predicated, some of them, *concerning things differing in species*, and others *concerning things differing in number*, because they may have immediate reference, either to a *Genus*, in which case they are predicated of all the species comprehended under that genus; or to a *Species*, in which case they are predicated of the individuals from which that species is derived.

Et N. B. ex recepto more loquendi, Genus et Speciem *prædicari in* (i. e. respondere quæstioni factæ per) *Quid*; Differentiam in *Qualequid*; Proprium et Accidens in *Quale*.

If it be asked, *Quid est illud?* it may be answered by the *Species*: It is a *man*; a *triangle*; *anger*: Or by the *Genus*: It is an *animal*; a *figure*; a *mental perturbation*.

If it be asked, *Qualequid est illud?* What is the quality or attribute which constitutes a part of its essence? the answer is made by the *Difference*: It is rational; it is three-sided; it is excited by a sense of injury received.

If it be enquired, *Quale est illud?* the answer may be made by the *Property*: It is risible; it has three angles; it seeks revenge. Or by some of its *Accidents*: It is tall, or learned, or virtuous; it is rectangular, or large, or equal to a given parallelogram; it is unreasonable, or just, or excessive.

Unde facile est conficere vulgatas Prædicabilium definitiones. Nam Genus definitur, Prædicabile quod prædicatur de pluribus specie differentibus in Quid. Differentia, quod de pluribus specie vel numero differentibus in Qualequid &c.

These quaint and redundant definitions are derived from the characteristics given in the three preceding paragraphs.

1. A Genus is a *Predicable*, predicated in Quid, concerning several things differing in species, as the material or common part of their essence:

Thus, *Animal* is a Genus, predicated in Quid, (i. e. expressing the nature or substance of the things signified,) concerning several classes or common natures, (i. e. several things differing in species, as *man, bird, beast, fish, &c.*) as the material or common part of their essence: the attribute of *animality* being alike essential to all those species.

Beast is the Genus comprehending *horses, cows, lions, tigers, bears, dogs, deer, elephants, &c.*

Fish is a Genus comprehending *salmon, whale, shark, eel, lobster, crab, trout, herrings, &c.*

Substance comprehends *body and spirit.*

Figure is predicated of *squares, circles, triangles, pentagons, &c.*

Metal applies to *gold, silver, tin, iron, lead, &c.*

Weapon to *sword, pistol, blunderbuss, dagger, club, cimeter, &c.*

2. *Difference* is a *Predicable*, which is predicated in *Qualequid*, of several things which differ either in species or in number, expressing the formal or distinguishing part of their essence. It is the term which denotes the primary characteristic attribute of any species; which distinguishes it from every other species contained under the same genus, and is the source of its other qualities or properties.

The *Difference* or distinguishing attribute of *Animal* is *sensation*, which separates it from *inanimate body*, whether *vegetable* or otherwise. *Extension* is the difference of *body*, distinguishing it from every *incorporeal substance*. *Reason* distinguishes *man* from *brutes*. *The having only three sides* distinguishes *triangles* from *squares, polygons*, and every other species contained under the common Genus, *rectilinear figure*.

3. *Species* denotes that class of predicables which is predicated in *Quid*, of several things differing in number, as expressing their whole essence.

Thus, *City* is a species including *London, Oxford, Paris, Athens, Rome, &c.*

River, includes the individuals, the *Thames, Isis, Cam*; the *Tyber, the Danube, the Halys, &c.*

Man, is the name of a species comprehending *Socrates, Plato, Aristotle, Zeno, Cratippus; Musæus, Homer, Virgil, Milton; Thucydides, Herodotus, Livy, Tacitus, Hume, &c.*

Star, applies to the *Polar Star, to Arcturus, Bootes, Sirius, Aldebaran, &c.*

4. *Property*, is the kind of *Predicable* predicated in *Quale*, of several things differing in species or in number,

(in other words, predicated either of different species or of different individuals,) *as necessarily joined to their essence*. It is a quality inseparable from that of which it is predicated, but it does not constitute part of its essence. It is therefore a secondary and dependent attribute, usually, (perhaps invariably,) flowing as a consequence from the primary attribute, namely, the difference.

The Property of *Man* is generally supposed to be *risibility*, which is the result of his essential quality or difference, *rationality*.

The Property of a *Triangle* is *the having three angles*, which necessarily proceeds from its distinguishing part, or difference, *having three sides*.

The Property of *Anger* may be conceived to consist in *the desire of revenge* which accompanies it, and is the effect of *the sense of injury received*.

It would require an accurate acquaintance with the nature of things to ascertain all the *predicables* which bear relation to them. A moderate knowledge of their nature will indeed suffice to enable us to refer the *species* to its true *genus*. But it is difficult to decide which, among the various attributes and characteristics of any particular class of beings or of notions, is really the essential attribute, and the occasion of the inferior attributes: i. e. which constitutes the difference and which the property. We readily refer *gold, silver, &c.* to the genus *metal*; *horse, cow, &c.* to the genus *animal*; *tulip, rose, &c.* to the genus *flower*. But it is impossible, in the present state of our knowledge, to decide which is that individual quality which essentially distinguishes each of those species from the other species comprised under the same genera. Naturalists are therefore compelled either to enumerate all the distinguishing qualities which they can discover in each; or to adopt an arbitrary mark of distinction instead of the essential difference.

5. *Accident*, is that which is predicated in Quale, of several things differing either specifically or numerically, as contingently joined to their essence.

For example: *Strength, learning, experience, virtue, speed, beauty, wealth, &c.* are accidents or contingent qualities to man. *Height, extent, &c.* to a house.

<i>Species.</i>	Body.	Proposition.
<i>Genus.</i>	Substance.	Sentence.
<i>Difference.</i>	Having solid extension.	Declaratory.
<i>Property.</i>	Occupying space.	True or False.
<i>Accidents.</i> {	White.	Important.
	Large.	Trifling.
	Heavy.	Elegant.
	Opaque, &c.	Short, &c.
<i>Genus.</i>	Speaker.	Water from clouds.
<i>Difference.</i>	Understanding the art of persuasion.	Falling in drops.
<i>Species.</i>	Orator.	Rain.
<i>Property.</i>	Apte, distincte, orate dicens.	Fertilizing the earth.
<i>Accidents.</i> {	Grecian.	Cold.
	Roman.	Violent.
	Vehement, &c.	Excessive, &c.
<i>Genus.</i>	Surface.	Plane-figure.
<i>Difference.</i>	Bounded by one or more lines.	Having three sides.
<i>Species.</i>	Figure.	Triangle.
<i>Property.</i>	Enclosing space.	Having three angles.
<i>Accidents.</i> {	Large.	Equilateral.
	Small.	Isosceles.
	Smooth, &c.	Right-angled.

Patet 2°. *Genus* esse *Totum* quiddam, nempe *Logicum*, sive in modo loquendi: quatenus continet (i. e. prædicationis ambitu complectitur) species tanquam *partes* sui *subjectivas*. *Speciem* quoque *Totum* esse, nempe *Metaphysicum*, sive in modo concipiendi; quatenus continet (i. e. ad perfectionem sui postulat) *Genus* tanquam *partem* sui *essentialem*. Unde *Differentia* *Generi* accedens, dicitur *Genus* ipsum *dividere*, quatenus ejus significata distinguit; et *speciem* *constituere*, quatenus ejus *essentiam* complet.

A *Genus* is (logically speaking) *a whole*; that is, the *word* which represents a genus is applicable to a whole class, the parts of which consist of the several species which that genus comprises, or of which it is predicated. Thus, *Animal* is the name of a class, comprehending the species *man* and *brute*; of which it may be said, *All men are animals: all brutes are animals*. *Rectilineal figure* comprehends *triangles, quadrilaterals, and polygons*; the individuals under all these species being included in that genus.

A *Species* is (metaphysically speaking) *a whole*; that is, the abstract notion denominated a *Species* is a complex or aggregate idea; and is therefore resolvable into its component parts. These parts are the simple or less complex notions of the *Genus* and the *Difference*. Thus the idea of *Man* is formed by the combination of the ideas *animal* and *rational*. *Rhetoric* includes the two notions of *science* as its *Genus*, and *employed in discovering what is persuasive* as its *Difference*.

Many species have no appropriate name, but are expressed by the combination of their constituent

parts, the Genus and Difference : for instance ; *passive-quality, rectilineal-figure, right-angled-triangle, port-wine, greenfinch, water-fowl*. Others are denoted by the Difference alone, as, a *repeater*, (watch which strikes the hour,) *Madeira, Champagne*.

§. 6. *De Prædicabiliū Speciebus.*

GENUS aliud *Summum*, aliud *Subalternum* est : *Species* quoque, in *Subalternam* et *Infimam* distinguitur. Genus summum, est quod nulli, *Species* infima, quæ omni *cognato Generi* subjicitur : Genus vel *Species* subalterna, quæ et cognato *Generi* subjicitur, et de cognatâ *Specie* prædicatur. Voco autem *Cognata*, quæ ex iisdem Individuis perpetuâ abstractione colliguntur ; ut *Homo, Animal, Vivens, Corpus, Substantia* : quæ ex *Socrate, Platone, &c.* expurgatis continue differentiis oriuntur.

It has been seen that the mind does not rest satisfied with the primary classification of individual objects. It proceeds to compare its abstract notions with each other, and to classify *them* also in the same manner. This process continues, until it has reduced every thing to one, or at the most to two general heads ; for some proceed no further than *substance* and *quality*, as two collateral universals : while others, conceiving of the one as *that which exists independently of any other created thing* ; and of the other as *existing only in connexion with some subject*, class them both under the notion expressed by *being*.

This most abstract notion is both the immediate genus comprehending *substance* and *quality* ; and

the ultimate genus of all those other intermediate notions through which the mind has, by perpetual abstraction from the original individuals, at length attained to it. It is therefore called the *highest*, the *ultimate*, or the *most universal* genus. It may be predicated affirmatively and universally of every cognate term ; but no cognate term can be so predicated of it.

On the contrary, the first common nature of which the mind forms a conception from the comparison of individuals, is called the *lowest*, *primary*, or *most specific* species. Every cognate term may be universally predicated of it ; but it cannot be predicated in the same manner of any cognate term.

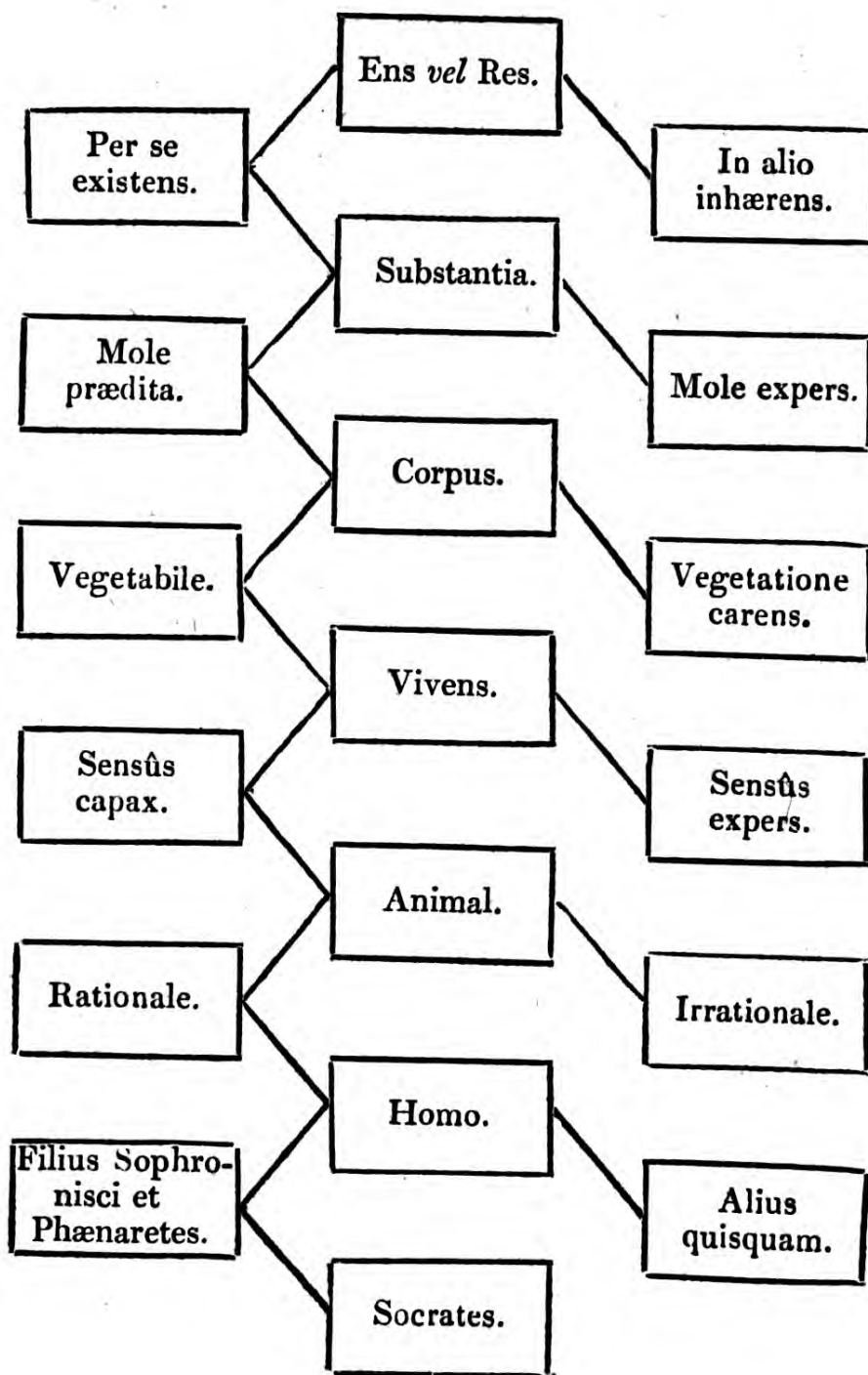
All the intermediate notions, (as well as the words which represent them,) are called *subaltern*. Like the intermediate steps of a ladder, each is at once superior to some, and inferior to others ; each may be employed as the *predicate* comprehending some *less* abstract cognate terms ; and as the *subject* included in some *more* abstract cognate terms ; each is a *genus* in relation to some *lower species* ; and a *species* in relation to some *higher genera*.

Thus, the name *Being*, which denotes the *universal* or *highest* Genus, may be employed as the predicate in any universal affirmative proposition of which any one of its cognate terms forms the subject : as, All *substances* are *beings* ; all *bodies*, all *animals*, all *men exist* or are *beings*. On the other hand, every cognate term may be universally asserted or predicated of the lowest species, as *lion*. For example ; it is true that all *lions* are *quadrupeds*, are *beasts*, are *brutes*, are *animals*, are *corporeal*, are *substances*, *possess life or organization*, are *beings*. But the word *animal*, which is a *subaltern* term, may be *predicated* of some of the terms which express notions in the same train of successive abstraction ; (as, all *lions*, all *quadrupeds*, all *beasts*, all *brutes* are *animals* :) and may also form a *subject* of which other

cognate terms may be predicated ; as, all *animals* are *endued with life*, are *corporeal*, are *substances*, are *beings*. In relation to these terms of which it is the subject, it bears the character and name of a *species* : in relation to the former, of which it is predicated, it bears the character and denomination of a *genus*.

It is manifest therefore that there is no *actual* difference between the *Subaltern Genus*, and the *Subaltern Species* ; for both the terms receive the same definition, and both apply to the same thing. The distinction is not absolute, but only *relative*. Thus, *Animal* is both a *Subaltern Genus* and a *Subaltern Species*. It is the former, in relation to *Man* ; it is the latter, in relation to *Living-body*, to *Body*, to *Substance*, and to *Being*. Again, *Living-body* is a *Subaltern Genus* ; for (though subject to higher Genera) it comprehends under itself the species, *Animal*, and *Man* : and it is a *Subaltern Species* ; because (although comprehending those subordinate species) it may be predicated of the higher genera, *Body*, *Substance*, *Being*.

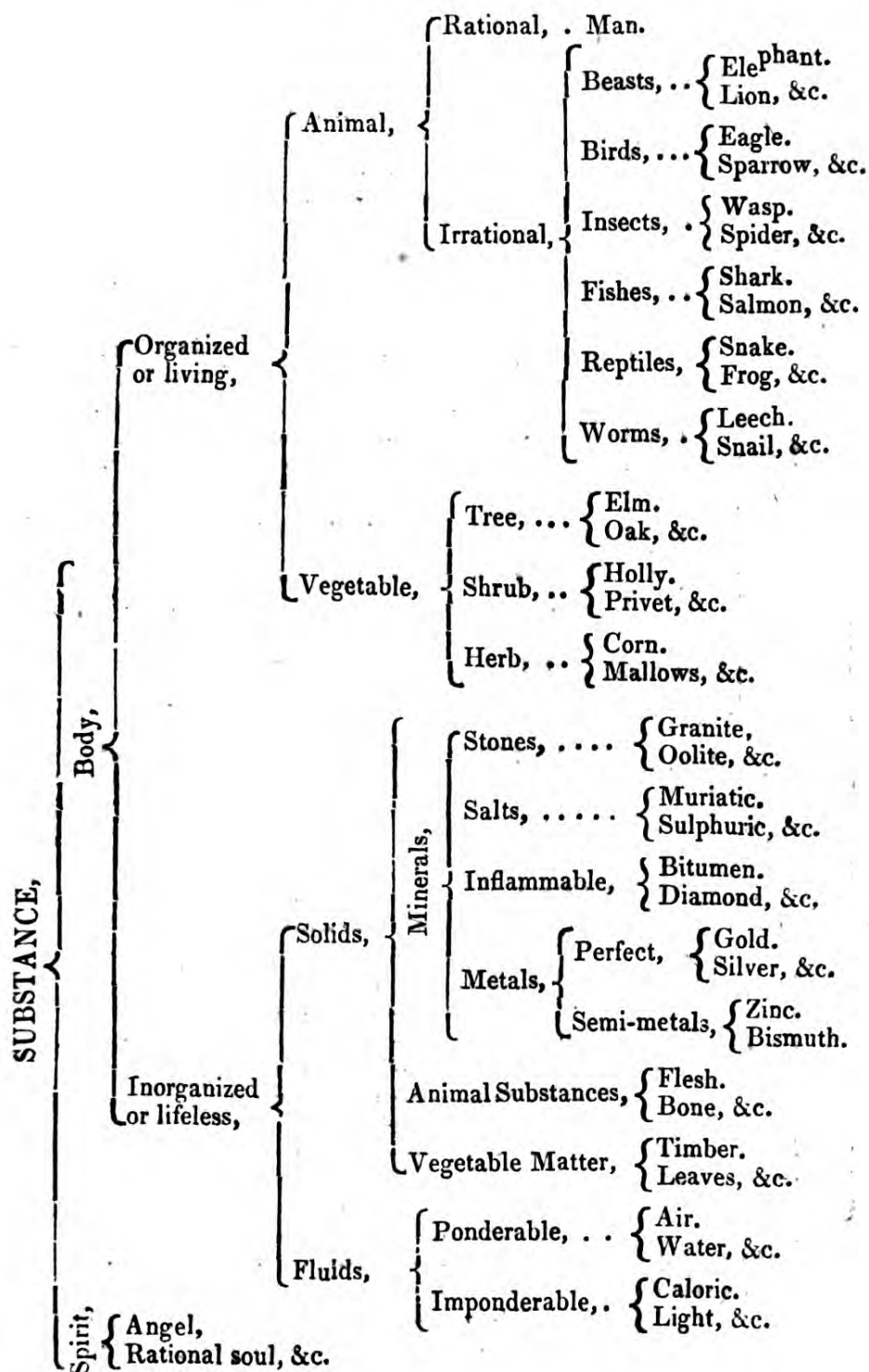
This may be illustrated by a scale somewhat similar to that which was adopted by Porphyry for a different purpose, and which has acquired the name of Arbor Porphyriana. In this scale *Ens vel Res* is the highest genus : *Homo* the lowest species : the other terms in the same column are subaltern terms. On the left hand are the logical *differences* which distinguish each species from the collateral species belonging to the genus immediately above it : on the right hand are the differences of those collateral species which are not specified in the scale.



The following tabular illustrations may tend to a further elucidation of the subject.

<i>Highest Genus.</i>	} Being.	Being.	Being.
<i>Subaltern Genera and Species.</i>	{ Substance.	Substance.	Substance.
	{ Body.	Body.	Body.
	{ Organized body.	Organized body.	Organized body.
	{ Animal.	Plant.	Vegetable.
	{ Brute.	Tree.	Pentandria.
	{ Beast.	Fruit-tree.	Monogynia.
	{ Quadraped.	Plum-tree.	Primula.
<i>Lowest Species.</i>	} Horse.	Green-gage-tree.	Cowslip.
<i>Highest Genus.</i>	} Being.	Being.	Being.
<i>Subaltern Genera and Species.</i>	{ Substance.	Quality.	Quality.
	{ Spirit.	Habit.	Passive-quality.
	{ Bodiless Spirit.	Moral-Habit.	Colour.
		Virtue.	Blue.
<i>Lowest Species.</i>	} Angel.	Temperance	Azure.

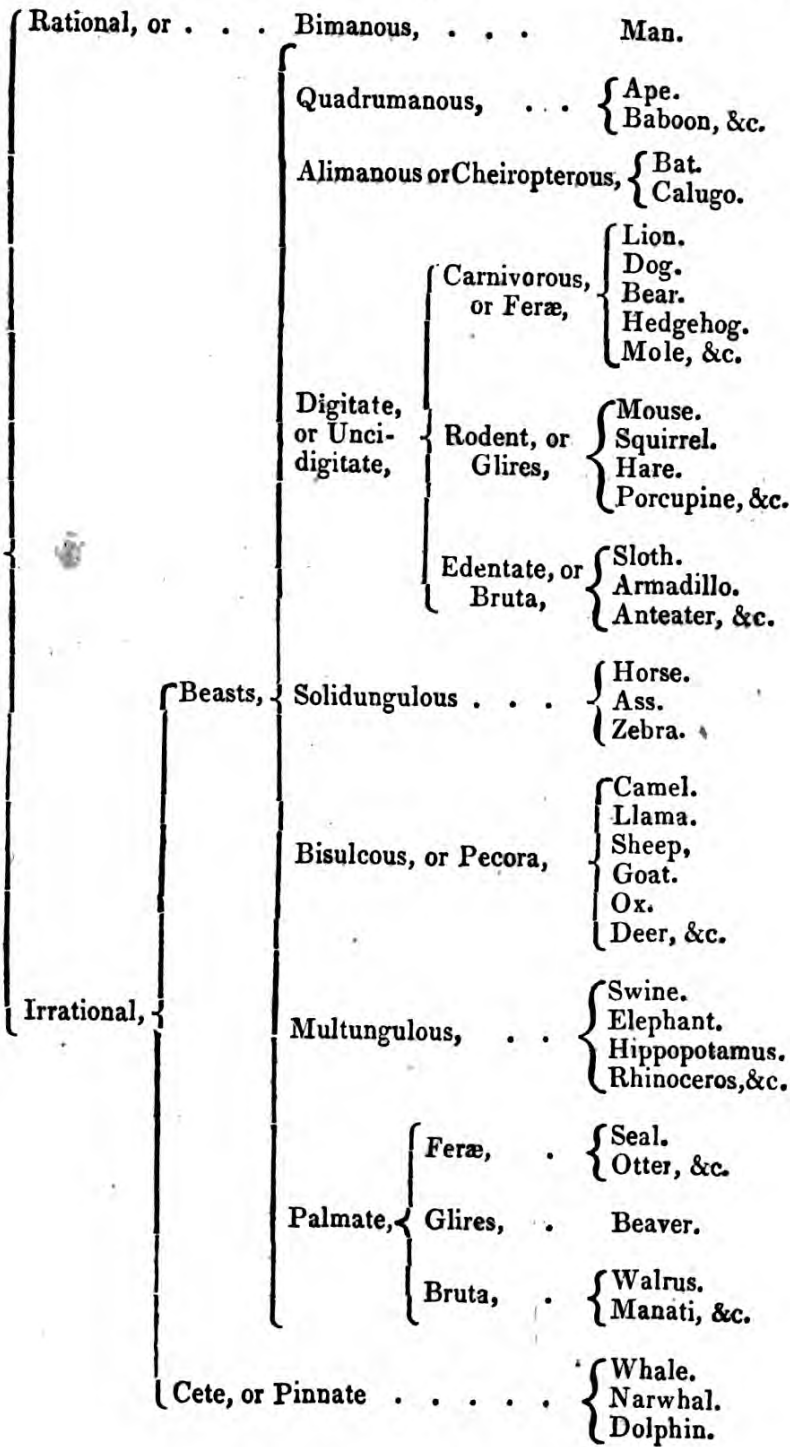
Properly speaking, there cannot be more than one Highest Genus, namely *Being* or *Entity*; which is a cognate term to every substance and quality which exists or can be supposed to exist. But a subaltern term may be relatively considered as a highest genus; as in the following examples, *Substance*, *Animals*, and *Mammiferous Animals*, express the most abstract ideas to which the process described in each extends; or vice-versâ, are the primary terms from which the combinations or distributions emanate.



DE SPECIEBUS

ANIMALS.	Vertebrated,	Pulmonary,	Warmblooded.	Mammiferous,	Terrestrial,	Bimanous.	Man.		
						Quadrumanous.	Ape, &c.		
						Alimanous.	Bat.		
						Digitate.	Lion, &c.		
						Solidungulous.	Horse, &c.		
						Bisulcous.	Bull, &c.		
						Multungulous.	Elephant, &c.		
						Pennisferous,	Terrestrial,	Accipitres.	Vulture, &c.
								Leviostres.	Parrot, &c.
								Pici.	Woodpecker.
Coraces.	Blackbird, &c.								
Passeres.	Thrush, &c.								
Gallinæ.	Pheasant, &c.								
Struthiones.	Ostrich, &c.								
Aqua-tic,	Aqua-tic,	Palmate.	Otter, &c.						
		Pinnate.	Whale, &c.						
		Cold-blooded,	(Amphibia,)	Four-footed, (<i>Reptiles.</i>)	Frog, &c.				
					Without feet, (<i>Serpents.</i>)	Snake, &c.			
				Inpulmonary,	(Fish,)	Cartilaginous,	Chondropterygii.	Lamprey, &c.	
							Branchiostegi.	Sturgeon, &c.	
						Osseous,	Apodes.	Eel, &c.	
							Jugulares.	Cod, &c.	
							Thoracici.	Turbot, &c.	
							Abdominales.	Salmon, &c.	
Invertebrated,	Articulated,					(<i>Insects,</i>)	Coleoptera.	Beetle, &c.	
							Hemiptera.	Cockroach, &c.	
		Lepidoptera.	Moth, &c.						
		Neuroptera.	Dragonfly, &c.						
		Hymenoptera.	Bee, &c.						
		Diptera.	Fly, &c.						
		Aptera.	Spider, &c.						
		Inarticulated,	(<i>Worms,</i>)	Intestina.	Leech, &c.				
				Mollusca.	Slug, &c.				
				Testacea.	Oyster, &c.				
Crustacea.	Echinus, &c.								
Corallia.	Coral-polypus.								
Zoophyta.	Polypus, &c.								

MAMMIFEROUS ANIMALS,



Quare 1. *Differentia* est vel *Generica*, quæ constituit *Speciem Subalternam*; vel *Specifica*, quæ infimam: hæc est quæ de numero differentibus, illa, quæ de specie differentibus prædicatur. Exempla, *Sensibile* et *Rationale*.

The *difference* joined with the *genus* constitutes a *species*. If that species be *subaltern*, (such as is also a *genus* to some subordinate species,) the *difference* which constitutes it is denominated *generic*, and is predicated of all the subordinate species: thus, the difference, *occupying space*, is predicated of every thing concerning which *body* is predicated; namely, of the two species, *animate* and *inanimate*. But the *difference* which constitutes a *lowest species* is called *specific*; and it applies to the individuals comprehended under the species; that is, it is predicated of things differing numerically. Thus *rational* is predicated of all the individuals to which the name of the species *man* applies.

<i>Genus.</i>	<i>Difference.</i>	<i>Species.</i>
Substance.	Material or occupying space.	Body.
Body.	Having life.	Living thing.
Living thing.	Animate.	Animal.
Animal.	Suckling their young.	Mammalia.
Mammalia.	With separate toes on all four feet.	Digitata.
Digitata.	With angular front teeth.	Feræ.
Feræ.	Fore teeth equal: tongue prickly: & claws retractile.	Felis.
Felis.	Yellow black-streaked skin.	Tyger.

In column 1, the first line contains the highest genus; the others, subaltern genera.

In column 2, the last line contains a specific difference; the rest are generic differences.

In column 3, the last line contains the lowest species; the other lines contain subaltern species.

2. *Proprium* quoque, vel *Genericum* est, quod necessario comitatur essentiam Generis summi vel subalterni; atque ex illâ adeo fluere atque oriri dicitur; vel *Specificum*, quod fluit ab essentiâ speciei infimæ. Illud itaque de pluribus speciebus; hoc, de unâ specie et pluribus Individuis prædicatur. Exempla, *Mobile* et *Risibile*.

The distinction of *Property*, as *generic* or *specific*, is of the same nature with that of *Difference*. *The having three angles*, being the property of the subaltern genus *Triangle*, is a *generic* property; *the equality of the square of the hypotenuse to the squares of the sides*, being the property of the lowest species *right-angle-triangle*, is a *specific* property. Each kind of property is predicated of the same objects as the essence of which it is the property: hence the property of a subaltern genus is predicated of all the *species* comprehended in that genus: that of a lowest species is predicated of all the *individuals* which partake of the nature of that species.

Shape is the *generic* property of *Body*.

Growth of *Living body*.

Voluntary motion of *Animal*.

Risibility is the *specific* property of *Man*.

Proprium tamen aliunde quadrifariam dicitur. 1. Quod convenit soli, sed non omni; scil. soli Speciei, sed non omni ejus Individuo;

ut *homini esse grammaticum*. 2. Quod omni, sed non soli; ut *homini esse bipedem*. 3. Quod omni et soli, sed non semper; ut *homini canescere*. 4. Quod omni, soli, et semper; ut *homini risibilitas*. Hujusmodi Proprium est, quod constituit Quartum Prædicabile.

Property, taken in a vague and less determinate sense, may signify that quality which agrees to any class of things, (whether genus or species,) either

1. Soli sed non omni: as *philosophy, reading, writing, the hope of a future existence, literature, virtue, prudence*, to *Man*.

Or, 2. Omni sed non soli: as *malleability, fusibility, yellow colour, weight, value*, to *Gold*.

Or, 3. Omni et soli, sed non semper: as *the act of laughter or speaking*, to *Man*.

Or, 4. Omni, soli, et semper: as *the faculty of laughter or of speech*, to *Man*; *shape or divisibility* to *Body*.

It may be doubted whether the third of these kinds of property can exist. An *act* (as that of *speaking* or *laughing*) cannot correctly be esteemed a property. In the instance given in the text there is an ambiguity. The *state* of hoariness may befall man *alone*; it does not belong to man *always*; but it certainly does not befall *omni*, every individual of the species. The *liability* to hoariness may perhaps be predicated of man *alone*; but it is probable that *all men* are *liable* to become hoary at all times: that effect having often been suddenly produced, even in young persons, by illness or great agitation of mind. In neither case therefore is a property discovered which answers to the description given.

Accidens, cum essentiæ junctum sit contin-

genter, adesse igitur vel abesse potest, salvâ interim essentiâ subjecti; cui tamen aliquando tam tenaciter inhæret, ut cogitatione solâ divelli atque separari possit; ut *Mantuanum esse, a Virgilio*. Quare vocatur *Inseparabile*. Quod autem actu sive reipsâ separari potest, ut albedo a pariete, dicitur *Separabile*.

The *place of birth, the parents, the past events of life, &c.* are *inseparable accidents* to any individual man. His *dress, posture, residence, opinions, &c.* are *separable accidents*.

That a *particular triangle is equal to another figure* is an *inseparable accident*; for if that equality be removed, the triangle is no longer the same.

The **PREDICAMENTS** or **CATEGORIES** are a certain enumeration of the several classes under which all abstract ideas, and their signs, common words, may be arranged. They are as follows:

1. *Substance*; either *material* or *immaterial*.
2. *Quantity*; either *continuous*, as lines, solids, surfaces, or as time; or *discrete*, as number, &c.
3. *Quality*; either *innate*, as the natural faculties; or *acquired*, as virtue, learning; or *sensible*, as form, sounds, colour, &c.
4. *Relation*; including the two *correlatives* and the *principle* of the relation.
5. *Action*.
6. *Passion*; including the transition either from *one place to another*, or from *one state to another*.
7. *Place*.

8. *Time*, past, present, and future.
9. *Posture*, whether *quiescent* or *active*.
10. *Habit* or *covering*; either *proper*, as *dress* to man, *skin* to beasts; or *figurative*, as *leaves* to trees.

They are enumerated and exemplified in these verses:

Summa decem : Substantia, Quantum, Quale,
 Relatio,
 Actio, Passio, Ubi, Quando, Situs, Habitus.
 Presbyter exilis, specie pater, orat et ardet,
 In campo, semper rectus, et in tunicâ.

This classification was introduced by Archytas, and adopted by Aristotle. An acquaintance with it is useful, chiefly because it is so often alluded to both in ancient and modern writings.

§. 7. *De Divisione.*

QUEMADMODUM Vox Singularis dicitur *Individuum*, ita et Communis *Dividua* dici potest. Eam enim per Metaphoram dividere dicitur, qui plura ejus significata recenset; nam in uno multa distinguit. Ita qui *animal* dicit esse (i. e. vocabulum *animal significare*) *hominem* et *brutum*, dicitur *animal in hominem brutumque dividere*.

Quare *Divisio* est distincta enumeratio plurium quæ communi nomine significantur: Estque analoga distributioni totius in partes.

Logical Division is *A distinct enumeration of the several classes or individuals which are signified by a common name.*

Though it is *analogous* to Physical Division, or the distribution of a whole into its parts, yet the two kinds of division are totally distinct in their nature, and must by no means be confounded with each other. The physical division of a *tree*, for instance, consists in its distribution into *root, trunk, branches, leaves, and fruit*; but the logical division of *tree* is into *fruit-tree* and *timber-tree*; each of which may be further divided; the former (to omit intermediate divisions) into *apple-tree, vine, orange-tree, &c.*; the latter into *oak, elm, ash, &c.*

Logical division may be thus distinguished from physical division. In the former the *divided-whole* may be universally predicated of each of the *dividing members*; as *all elms, all oaks, all beeches, &c.* are *timber-trees*: *all men, all brutes, are animals*. But this cannot take place in the latter. Moreover, physical division can be applied to *individuals* only; logical division only to *classes*.

To these two species of division may be added a third, which may be called *metaphysical* division. It consists in an analysis of the more simple ideas which form the component parts of a complex idea. This method is adopted, for example, when *Man* is contemplated, first in reference to those qualities which he possesses in common with other animals; and then, with reference to his distinguishing characteristics as *man*: that is, in other words, the idea of *man* is divided into the two parts, *animality* and *rationality*. Thus *repentance* has been divided into *conviction, contrition, confession, and forsaking of sin*. This process may be distinguished from *logical* division on the same principle as the *physical* division; namely, the thing-divided cannot be predicated of each part separately. It cannot be asserted that all *conviction* of sin, all *sorrow* for sin, all *confession*, or even all *forsaking* of sin is *repentance*.

Logical division is the converse of abstraction. The tables on pages 57, 58, and 59, illustrate both.

If the terms are considered in the retrograde order, from right to left, that is, from the lowest species to the successive genera, they represent the process of *abstraction*. If read in the order in which they stand, from left to right, they represent the opposite process, namely *division*.

Animals may be logically divided into *rational* and *irrational* :

Or into *Gressilia*, *Volatilia*, *Natatilia*, *Reptilia*, and *Zoophyta* :

Or into *Mammalia*, *Aves*, *Amphibia*, *Pisces*, *Insecta*, and *Vermes*.

Gressile Animals may be divided into *Bipeds* and *Quadrupeds*.

Mental Operations are either acts of *Simple Apprehension*, of *Judgment*, or of *Reasoning*.

Virtues are classed under the heads of *Prudence*, *Justice*, *Fortitude*, and *Temperance*.

Or thus : *Virtues* are *moral* and *intellectual*. *Moral excellencies* or *virtues* are *courage*, *temperance*, *liberality*, *magnificence*, *magnanimity*, *meekness*, *courtesy*, *veracity*, *facetiousness*, *modesty*, *justice*. *Intellectual excellencies* are *art*, *science*, *wisdom*, *understanding*, *prudence*.

The lowest species may be divided either by an artificial classification, or by the enumeration of its individuals. *Men* may be divided into *civilized* and *uncivilized* : *white*, *black*, and of *intermediate colour* : *European*, *African*, *Asiatic*, *American*, and *Australian* : *learned* and *unlearned*. *Planets* may be divided into *those attended by satellites* and *those without satellites* ; or by the enumeration of *Mercury*, *Venus*, *Mars*, &c.

Unde et nomen ipsum Commune dicitur *Totum Divisum*, et distincta ejus significata, *Partes* sive *membra dividenda* ; et bene dividendi leges statuuntur tres.

1. Dividentia sigillatim minus contineant (i. e. arctius significant) quam Divisum. Nam Totum est majus partibus singulis. 2. Dividentia conjunctim plus minusve ne contineant quam Divisum. Nam Totum est æquale partibus universis. 3. Membra Divisionis sint opposita, (i. e. in se invicem ne contineantur :) nam sine distinctione frustra est partitio.

1. Each member of the division should comprehend a smaller number of subordinate classes or of individuals than the subject or term divided.

To classify *animals* as *intelligent* and *not-intelligent beings*, would offend against this first rule; since each of those classes contains something not included in the word *Animal*.

2. The aggregate of all the members of a division taken together should comprehend every thing denoted by the divided term, and nothing more.

In the following passage Cicero (or probably the interpolator) offends against this rule. "Virtus omnis tribus rebus fere vertitur: quarum una est in perspicendo quid in quâque re verum sincerumque sit: alterum cohibere motus animi turbatos, appetitionesque obedientes efficere rationi: tertium, iis quibuscum congregamur uti moderate et scienter." (Off. ii. 5.) The parts together do not equal the whole. The virtue of *fortitude* is omitted. "Præterire aliquid maximum vitium in dividendo est."

3. An entire distinction between the parts or members is essential to a correct division. This rule is violated if the divisions be such that any individual or subordinate class may be arranged under more than one head.

The common division of the *Operations of the*

mind into *Simple Apprehension, Judgment, Reasoning, and Method*, offends against the third rule. *Method* is not opposed to, but is comprised in, *Simple Apprehension*.

Lord Bacon points out an error of the same kind, when he says, "Differentiam Motûs *naturalis et violenti* maximâ cum socordiâ introducunt philosophi; cum omnis motus violentus etiam *naturalis* reverâ sit."

Much caution, indeed, is requisite to frame so accurate a division, that no one subordinate class or member shall interfere with another. Thus if a classification of *books* be made according to their subjects, into works of *divinity, law, arts and sciences, history, and belles-lettres*; it may be objected that *ecclesiastical history* may be indiscriminately arranged under the head of *divinity* or of *history*; and *grammar and rhetoric* under either *arts and sciences* or *belles-lettres*. Against the customary grammatical division of *words or parts of speech*, it may be urged that *pronouns* may be classed under the heads of *substantives and adjectives*; *participles* under *verbs or adjectives*; *interjections* under *adverbs, verbs, and substantives*. A similar objection has been adduced against the Linnæan arrangement of the vegetable kingdom; because every species which belongs to the classes *monœcia, diœcia, and polygamia*, is reducible to some one of the other classes. If the twenty-four classes are represented as the direct and immediate divisions of the general term *Plant*, the objection is valid, and may be extended to several of the other classes also. But the more scientific arrangement of Linnæus removes the objection. For he divides *Plants*, first, into those which *have*, and those which *have not, visible flowers*; (the *phænogamia and cryptogamia*;) the latter of which constitutes his twenty-fourth class. The former of these he subdivides into those which *have*, and those which *have not, the stamina and pistils in the same flower*;

(*monoclinia* and *diclinia*;) the latter comprehending the three classes already mentioned; the former further divided into those which have the *stamina separated* or *not separated*, (*diffines* and *affines*;) these last being distributed into five classes; while the former are again sub-divided into those which have *stamina of indeterminate* and those which have them of *determinate relative length*; these comprehending the 14th and 15th classes, and those the first thirteen classes.

The difficulty of securing a perfect division is obviated when the subject admits of the dichotomy, or distribution constituted by the use of two contradictory terms; that is, of a definite term with its corresponding indefinite, as described on page 23. Thus, all matter is *organized* or *unorganized*. Of such divisions several examples occur on pages 57 and 58. Every correct twofold division implies this contradiction. The division of *history* into *sacred* and *profane* is equivalent to *sacred* and *not-sacred*. The division of *literary compositions* into *poetry* and *prose*, either signifies *poetry* and *not-poetry*, or else lies open to an objection; since a question might arise whether such works as *Ossian* and *Telemachus* do not belong to both, or to an intermediate class. Thus it is possible to conceive of the future discovery of some *warmblooded animals* which shall be neither *viviparous* nor *oviparous*; neither *mammiferous* nor *penniferous*, or even uniting both these characters. But according to the present state of knowledge and the probable inferences of legitimate induction, those distinctions are virtually the same as *mammiferous* and *non-mammiferous*; *viviparous* and *non-viviparous*.

The three rules above given are essential to the *correctness* of a division. But the *propriety* and *elegance* of the arrangement, as well as its adaptation to the memory, will depend much on the fol-

lowing additional rules. *All the members of a division should consist of collateral species; and, All the denominations of the several members should have reference to some common principle or leading idea.*

The latter of these requisites is wanted in Cuvier's arrangement of *mammiferous animals* into the following orders; *bimana, quadrumana, sarcophaga, rodentia, pachydermata, ruminantia, edentata, and cetacea*. In the classification of Blumenbach, the term *celacea* does not coincide with the denominations of the other members of the division, as *bimana, quadrumana, &c.* (see pages 58, 59.) It may in general be observed, that those denominations of genera which are derived from the leading species contained under them, (as *cetacea, feles,*) are less satisfactory and scientific than the adoption of significant names. The botanical arrangement of Jussieu is faulty in this respect.

But the former of these two rules is of still greater importance. A genus should be distributed into the species immediately subordinate to it. These may, if necessary, be divided by a subsequent process into their respective subspecies. Thus, the division of *knowledge* into *sensible, rational, and artificial* knowledge is harsh and unsuitable. It should be first divided into *natural* and *artificial*; and the former branch may then be subdivided into *sensible* and *rational*. Again, *European Architecture* would be clumsily divided into *Grecian, Composite, Norman, and English*. It should be rather divided into *Grecian* and *English*; the former class into *pure* (comprehending the four orders) and *mixed or composite*; the latter class (*English*) into *Norman* and *pure-English*; this being also subdivided into *early, decorated, and perpendicular English*.

Cicero thus complains of the violation of this rule; "Quomodo autem philosophus (Epicurus) loquitur tria genera cupiditatum? *naturales et necessa-*

rias : naturales, non necessarias : nec naturales, nec necessarias ? Primum divisit ineleganter ; duo enim genera quæ erant, fecit tria. Hoc non est dividere sed frangere rem. Qui si diceret, cupiditatum esse duo genera, *naturales et inanes : naturalium quoque item duo, necessarias et non necessarias ;* confecta res esset. Vitiosum est enim in dividendo, partem in genere numerare."

But Cicero himself also errs " partem in genere numerando." He represents Panætius to have been guilty of an offence against the second fundamental rule, in his threefold distribution of the subjects of *moral deliberation ;* namely, *de honesto, de utili, de comparatione eorum.* To supply this supposed defect he adopts a more copious enumeration ; namely, of *virtue or duty ; of the relative obligation of different duties ; of utility ; of the relative value of different useful things ;* and, of *the comparison between duty and utility.* And he adds, "Quam ille triplicem putavit esse rationem, in quinque partes distribui debere reperitur." The division of Panætius, however, seems most correct ; the *absolute* and the *relative* obligation or usefulness of any actions, being the respective subdivisions of the two general classes, *de honesto* and *de utili.* Cicero appears unintentionally to have suggested this arrangement by his mode of summing up : "Primum igitur est *de honesto, sed dupliciter : tum pari ratione de utili : post de comparatione eorum disserendum.*"

The same author falls into a still greater inaccuracy while in one part of his work on Offices he represents *prudence* (defining it *the acquisition of science*) to be a part of one of the *subjects of moral deliberation,* (namely, the *honestum,*) and therefore necessarily comprehended under that general head ; and yet afterwards distinguishes between the two as collateral species under the same genus. "Omnis autem cogitatio motusque animi, aut in *consiliis capiundis de rebus honestis et pertinentibus ad bene bea-*

teque vivendum, aut in studiis scientiæ cognitionisque versabitur."

§. 8. *De Definitione.*

DIVISIONEM excipit (quæ per Metaphoram quoque dicitur) *Definitio*; cujus est, assignare conceptus et voces, quibus ea, quæ ab invicem distincta volumus, velut agrorum fines, ex limitibus suis dignoscantur. Quæ cum definitis notiora esse debeant magisque obvia, *Definitio* vulgo dicitur *Oratio explicativa definiti*. *Oratio* (inquam) ut a nomine distinguatur; *Explicativa* quoque, nam et nomen *exprimit*.

The most superficial observer must have noticed how vaguely and indefinitely words are commonly employed. To the same word, some attach a greater number, others a smaller number of simple notions. Even the same person does this at different times, partly from inadvertency, and partly from necessity; as may be observed in the applications of *ratio* noticed in the illustrations of analogous nouns on page 28. Words are moreover often incorrect in their original application, having been primarily employed to represent ideas attained by an inaccurate process of abstraction; as the use of the word *heat* seems to have been derived from the erroneous consideration of the cause and the effect, as if they were one and the same. A similar observation may be made on the words *idea*, *positive and negative electricity*, &c. Hence *words* are among the chief occasions of inaccurate apprehensions and indistinct judgments. We are so habituated to their use, that we conceive the abstract notions to which

they are applied to have been the natural and almost intuitive result of our own reflection, confirmed by universal acknowledgment, and therefore necessarily correct : while we are perhaps only following the vague application adopted by the thoughtless, or by some philosopher imperfectly acquainted with his subject. The importance of the distinction between the *primary* and the *secondary* intention of nouns originates in this ambiguity of language. Hence also arises the necessity of *Definition*. It serves to shew what notions are to be included, and by inference what to be rejected, in each word : and thus to afford, as nearly as possible, a precise understanding of its meaning. Even thus, we can but imperfectly succeed in acquiring precision ; not only because, in spite of the best definition, the mind will recur to the notions which it has previously been accustomed to apply to any particular term ; but because the *instruments* of defining are still *words*, and therefore liable to the same ambiguity as the term defined. This circumstance renders a single word wholly incompetent to sustain the office of a definition. A synonym may explain, but cannot define a word. A combination of words affords a greater approximation to precision, because the ambiguity of each is in some measure corrected by its connexion with the rest. Even the definition of the term *Definition*, as given in the text, illustrates this ambiguity ; since the word *sentence* is there employed, not in its common use, as a combination of words containing and relating to a finite verb : but, as Aristotle often uses it, for any combination of words, with or without a verb.

Definitio alia *Nominalis* est, quæ vocis significationem aperit ; alia *Realis*, quæ rei naturam. *Realis* iterum vel *Accidentalis*, sive *Descriptio*, quæ definito accidentia (puta causas, effectus,

proprietates, aliaque id genus) assignat; vel *Essentialis*, quæ partes essentiæ constitutivas. *Essentialis* denique, vel *Metaphysica* sive *Logica*, quæ Genus et Differentiam; vel *Physica*, quæ partes essentiæ physicas, i. e. realiter distinctas: nam Genus et Differentia solâ mente distinguuntur.

E. g. Definitur homo *Nominaliter*, qui ex humo. *Accidentaliter*, Animal bipes implume. *Metaphysice*, Animal rationale. *Physice*, Ens naturale constans corpore organico et animâ rationali.

Definition is	{	Nominal.	{	Metaphysical.
		Real		
	Essential			Physical.

The four *lowest species* of definition are *Nominal*, *Accidental*, *Metaphysical*, and *Physical*. Of which the following may serve as examples:

(NOMINAL.) A *Proposition* is that which is *proposed* to the judgment for its assent or rejection.

(ACCIDENTAL.) A *Proposition* is the vocal or written expression of the act of judgment.

(METAPHYSICAL.) A *Proposition* is a declaratory sentence.

(PHYSICAL.) A *Proposition* is that which consists of a subject, a predicate, and a copula.

(MIXED.) A *Proposition* is a declaratory sentence, grammatical and perfect, signifying something either true or false, and free from ambiguity.

It will be a more convenient arrangement, to illustrate the nature of *real* definition previously to that

of *nominal* definition; and of the two branches of real definition to consider the *essential* before the *accidental*.

Essential definition assigns the *primary* and *essential* qualities or parts of the thing to be defined. But the parts or qualities thus assigned may be two-fold; namely, either the *natural* and *constituent* parts of each individual comprehended under the common name; as the *wheels*, the *balance*, the *spring*, the *graduated dial*, the *hands*, &c. of a *watch*: or the *imaginary* and *metaphysical* parts which complete the abstract notion represented by the word; namely, the *Genus* and the *Difference*; such as the notions of *time-keeper*, and, *adaptation to the pocket*, which are the metaphysical parts of the idea expressed by the word *watch*, and suggest the definition, *a pocket time-keeper*. This species of *essential* definition is therefore denominated *logical* or *metaphysical*; the other, *physical* or *natural*.

1. *Logical or Metaphysical Definitions* are the most perfect kind of definition, and when they can be ascertained should be employed in preference to all others. The following are examples:

Προαίρεσις, Βουλευτική ὀρεξις τῶν ἐφ' ἡμῖν.

Ἀκολασία, Ἡ ἀμαρτία παιδική.

Ἀκολασία, Ἡ περὶ ἡδονῶν ὑπερβολή.

Ἄσωτος, Ὁ περὶ χρήματα ὑπερβάλλων.

Light, air reduced to its most subtle state.

Animal, vivens sensible.

Belief, assent produced by apparent credibility.

Knowledge, assent produced by self-evidence, or demonstration.

Tree, a plant which supports itself by a woody stem.

Parallelogram, a plane rectilineal four-sided figure, the opposite sides of which are parallel.

Ἔστιν ἡ ῥητορικὴ δύναμις περὶ ἕκαστον τοῦ θεωρῆσαι τὸ ἐνδεχόμενον πιθανόν.

Ἡ ὀλιγωρία ἐστὶν ἐνέργεια δόξης, περὶ τὸ μηδενὸς ἄξιον φαινόμενον.

Πραῦνσις ἐστὶ κατάστασις καὶ ἡρέμησις ὀργῆς.

Πραότης ἐστὶ μεσότης περὶ ὀργῆς.

Medium Officium, id est, quod, cur factum sit, ratio probabilis reddi possit.

Life is the spontaneous propulsion of juices.

Heat is the sensation produced by caloric on animated bodies.

A logical definition is most complete when it consists of the term signifying the proximate genus, with that denoting the primary characteristic, or difference. But it may also be composed of a more distant genus with a succession of differences or distinguishing epithets. This is often rendered necessary by the poverty of language, which does not afford a name for every genus. Thus the proximate genus of *parallelogram* has no appropriate name. The class to which that genus is subordinate is likewise nameless. It is necessary therefore to go back to a still more abstract term, *figure*: to which a difference or epithet is added, to constitute the subordinate class, *plane-figure*. This again is limited by another difference, *rectilineal*. The aggregate, *rectilineal-plane-figure*, is further reduced to a subordinate class by the addition of *four-sided*. The whole compound word, *four-sided-rectilineal-plane-figure*, represents the proximate genus of *parallelogram*, to which it only remains to append the specific difference, *having-its-opposite-sides-parallel*. Sometimes this method is resorted to for scientific purposes. So *man* instead of being declared to be a *rational animal*, may be logically defined, *a being endowed with independent existence, definite form, solidity, organization, life, sensation, and reason*: the aggregate of all the ideas except the last constituting that which is denoted by the term *animal*.

2. The other class of *essential definitions* consists

of those which enumerate the constituent parts of the individual objects defined: and are therefore called *physical* or *natural definitions*.

These are best adapted for the explanation of those species of which the individuals are familiarly known, and obviously reducible to their natural parts. They partake of the character of logical definitions, because they commence with the mention of a genus, and most properly, the proximate genus; while the enumeration of the parts supplies the place of a logical difference; as,

Animal, a living body, consisting of head, body, legs, &c.

Tree, that which consists of root, trunk, branches, leaves, and sap.

Chair, a machine which is composed of legs, a seat, and a back.

Ink, a mixture of copperas, gall, and gum.

Entablature, the architrave, frieze, and cornice of a pillar.

3. *Accidental Definition*, i. e. *Description*, is the remaining species of *Real Definition*. It describes the *object* or *thing* denoted by any word, by assigning some characteristic, though not primary, qualities belonging to it. It is, frequently, the only method by which an object can be defined, in consequence of our ignorance both of the natural and component parts, and also of the metaphysical parts; especially of that leading quality which constitutes the logical Difference. Thus we *define* or rather *describe* animals, plants, minerals, and other natural objects, by an enumeration of their respective qualities or accidents. Definitions of this kind are indeed usually introduced by the mention of the genus; to which is added a sort of subordinate difference consisting of such a specification of characteristics as may suffice to distinguish the object defined from every collateral species. For example,

Silver, a metal of a white colour, less ductile than gold; more elastic than gold, lead, or tin, but less so than copper; more sonorous than any other metal except copper; soluble in nitric acid; and turned to a yellowish-black color by the vapor of sulphur.

A *Clock* is a mechanical contrivance to shew the progress of time.

Heat is the sensation produced by friction, exercise, or approaching near fire.

Animal, an organized living body, endued with sensation.

Animal, a body which can move itself from place to place.

Dog, a quadruped distinguished by six fore teeth and six grinders in the upper jaw, and six fore teeth and seven grinders in the lower jaw.

Dog, the most intelligent, and faithful, and affectionate of domestic animals.

Honey, a viscous vegetable fluid, of a whitish or yellowish colour, sweet to the taste, soluble in water, and becoming vinous on fermentation, inflammable, liquable by a gentle heat, and of a fragrant smell.

Tree, that which shoots out into leafy branches.

Ink, a liquid used for the purposes of printing and writing.

Light, the material medium of sight.

4. *Nominal definitions* are those, the object of which is, not to describe the nature of the thing intended by the word, but to explain the mere signification of the word itself. They differ from the several species of *real* definitions, not by their form, but by their object and purpose. With regard to each of the examples of definition already given, if the end in view is to adduce characteristics by which the object defined may be ascertained and recognized, it is *real*; and belongs to its *respective*

class, whether *logical, physical, or descriptive*. But if the intention of the definition is simply to prevent a misapprehension of the precise meaning of the word, the same definition is *nominal*. Definitions of the mental operations, and mathematical definitions, are therefore generally nominal: their object being only to avoid ambiguity by stating in what sense each word will be employed; that is, of what notions it is to be the sign. If therefore one author defines *conception, a notion of any object whether real or fictitious*; another, *a notion excited by any object of sensation*; and another, *a notion excited by any absent object of perception or sensation*; it cannot be asserted that either is actually wrong in his definition; for he merely states the meaning in which he employs the word. But that writer will be deemed most judicious whose definition least deviates from the generally received application of the word. The observations and examples on *nouns of secondary intention*, (pages 34 and 35.) will further illustrate the use of nominal definitions.

Under this head may be classed *Etymological* definitions: which explain the original import of the word defined: for example,

Animal cui est anima.

Fides ita appellatum est, quia fiat quod dictum est.

Ἵνομάζεται Δίκαιον, ὅτι δίχα ἐστίν, ὡςπερ ἂν εἴ τις εἴποι
δίχαιον, καὶ ὁ Δικαστής, διχαστής.

Ἰσχυρία, τὸ τῆς κολασέως δεομένον.

Προαιρετὸν λέγεται ὡς ὃν πρὸ ἐτέρων αἰρετὸν.

Parallelogram, a figure composed ἐκ γραμμῶν παραλληλῶν.

Light, the fluid substance which is lightest, or possesses the smallest degree of weight.

Qui sapientiam expetunt, philosophi nominantur; nec quidquam aliud est philosophia, si interpretari velis, præter studium sapientiæ.

Aldrich appears, from the example which he gives,

to have confined the term *nominal* to this kind of definition. But as on the one hand many other definitions are more correctly called nominal, these etymological definitions, on the other hand, are not exclusively nominal, for they are often adduced, as *accidental*, and sometimes as *logical* definitions, to elucidate the nature of the *subject*.

Bonæ Definitionis leges potissimum tres sunt.

1. Definitio sit adæquata definito: alias non explicat definitum. Quæ enim angustior est, explicat tantum *partem*, cum definitum sit *totum*; quæ laxior, explicat *totum*, cum definitum sit tantum *pars*. 2. Ut *per se* clarior sit et notior definito: alias non explicat omnino. *Dico* tamen *per se*, quia *per accidens* potest minus intelligi quod notius est suâ naturâ. 3. Ut justo vocum propriarum numero absolvatur: nam ex metaphoris oritur ambiguitas, ex nimiâ brevitate obscuritas, ex prolixitate confusio.

1. If *man* be defined *an intelligent being*; or a *tree, an erect plant having foliage*: such definitions are erroneous; inasmuch as they describe a whole of which the defined term is but a part: in opposition to one branch of the first rule.

If *man* be defined *a civilized rational creature*; the first rule is disregarded, by the limitation which excludes *uncivilized man*. The definition of *enthusiast, as one whose feelings are either unduly or excessively engaged in religious matters*, is too limited, since the term defined includes also those whose feelings are excessively or unduly excited by any object whatever.

2. The following definitions offend against the second rule.

Apple, the fruit of the apple-tree.

The right hand; not the left.

Net-work; any thing reticulated or decussated with interstices between the points of intersection.

Judgment; that which is expressed by the combination of words into a sentence.

Triangle; a figure which has any of its exterior angles equal to its two interior and opposite angles.

Definitio, Oratio explicativa definiti. This is inaccurate, because of correlatives the one cannot be better known than the other. Therefore neither of the words *definitum* and *definitio* can be properly used in an explanation of the other.

Words expressing less complicated ideas are *absolutely* (*per se*) more perspicuous than those which express more complex ideas. Hence, though use has rendered the word *man* more familiar to us than the words *rational animal*, these are in their own nature more clear and better known.

The same may, perhaps, be said in defence of Dr. Johnson's definition of *net-work*, with the exception of the word *reticulated*.

Words expressive of ideas purely simple cannot be properly defined. Hence the definitions of the operations of the mind are less clear, or at the best not more clear than the operations themselves: they in fact do little more than substitute one denomination for another.

3. The third rule comprehends two distinct requisites of correct definition.

The first branch of it requires that definitions should be expressed in a suitable number of words; in opposition to prolixity or excessive brevity. The following are consequently improper.

Money is that useful species of property, which, by serving as a common measure by which all the

necessaries, all the conveniences, and all the luxuries of life may be estimated and procured, becomes itself the great essential, and comprises within itself all that can be thought needful to render life desirable.

Money is coin.

The second requisite contained in the third rule is that definitions should be expressed in *proper* (as opposed to *metaphorical*) words. The following instances are therefore improper.

Money is the servant of the wise and virtuous, but the master of the wicked and the unwise. In the hands of the former it is the tool or instrument by which he performs innumerable acts of virtue; while in the hands of the fool it is the productive root of vice, shame, and misery.

Judgment is an operation by which the mind, sitting on a tribunal, passes sentence on the agreement or disagreement of any two objects.

Astronomy is the science which instructs us in the laws or rules that govern the heavenly host, and by which their motions are directed.

CAP. II.

DE PROPOSITIONE CATEGORICA PURA.

§. 1. *Quid sit Propositio.*

SECUNDA Pars Logicæ agit de *Propositione* sive *Enuntiatione*; quod est signum secundæ operationis Intellectûs, sive Judicium verbis expressum.

Quare, ad Propositionem legitimam requiritur,

1. Quoad vocem, ut sit *Oratio affirmans vel negans*, quæ est ejus *essentia*.

2. Quoad sensum, ut *verum vel falsum significet*, (id scil. quod res est, vel secus, dicat,) quod *essentiæ necessario nexum*, et proinde *proprietas* est. Unde et

3. Non est *ambigua*; sic enim orationes esset. Nec 4. *Solœca vel mutila*; sic enim nihil significaret.

1. The definition, *A sentence which either affirms or denies*, or, *A declaratory sentence*, comprises the whole essence, or the complete abstract notion of *Proposition*. For *Propositions* form one of the species comprehended under the genus, *Sentence*; and they are distinguished from all the collateral species, (as interrogatory, imperative, &c.) by the difference *declaratory*, or *indicative*; that is, *expressing either an affirmation or a negation*.

The following sentences are not declaratory; and consequently are not propositions.

Can envy dwell in heav'nly breasts ?

Tu modo posce deos veniam.

Hic murus aheneus esto,

Nil conscire sibi.

Heu! hominum ignaræ mentes !

Quando fortuna non mutat fidem ?

Da spatium vitæ, multos da, Jupiter, annos.

The following, on the other hand, are *Propositions*; since they either affirm or deny :

Deep disappointment lurks in every prize.

Est modus in rebus.

Nullus argento color est, nisi temperato splendeat usu.

Quod honestum non est, id non decet.

Propositions are frequently so combined as to form a complex sentence; as,

Gold and silver are pure metals: that is, gold is a pure metal, and, silver is a pure metal.

Unsought advice is the dictate of presumption, and appears to convey implicit censure: which contains two propositions, each predicating something different concerning the subject, Unsought advice.

Neither death, nor life, nor angels, nor principalities, nor powers, nor things present, nor things to come, nor height, nor depth, nor any other creature, shall be able to separate us from the love of God. This sentence contains as many propositions as there are subjects; the same predicate, *shall be able*, &c. being applied to each.

2. The quality of *necessarily signifying either that which is true or that which is false*, is the logical property of a Proposition. For it is the immediate and natural consequence of its *difference*, namely, affirmation or negation.

To be true or false is the property of *judgment*; to *signify* what is true or false is therefore the property of *propositions*. Those epithets are impro-

perly used, when applied to any operation of the mind not comprehended under judgment.

3. An *ambiguous* sentence is in fact a *double* sentence. Ambiguity may be occasioned either by the equivocal sense of the words, or by the dubious construction of the sentence.

The heathen oracles afford numerous instances of both these kinds of ambiguity; as,

Κροίσος Ἄλυν διαβάς μεγάλην ἀρχὴν καταλύσει: which leaves it doubtful whether the kingdom of Persia or of Lydia was to be destroyed. (*Herod. i. 74.*)

Ἦξει Δωριακὸς πόλεμος καὶ λοιμὸς ἀμ' αὐτῷ: where the ambiguity consists in the similarity of sound between λοιμὸς and λιμός. (*Thuc. ii. 54.*)

Τὸ Πελασγικὸν ἀργὸν ἄμεινον. (*Thuc. ii. 17.*)

Antiquam exquirite matrem. (*Æn. iii. 96.*)

Comic writers abound with ambiguous sentences, intended to be strictly more than one sentence, that is, to be understood in different senses; as,

᾽Ω γύναι, λίαν σπαθαῖς: You are *very* diligently weaving; or, you are *living very* extravagantly. (*Aristoph. Nub. 55.*)

Γαλήν' ὀρεῶ: I see (τὰ γαλήνια) *a calm*; or (γαλήν) *a cat*. (*Aristoph. Ran. 306. Eur. Or. 279.*)

Many passages in ancient authors appear ambiguous because we are not sufficiently acquainted with the idiom of their language or with allusions which were familiar to those for whom they wrote. A Roman would probably have found no ambiguity in the line, *Hædorumque gregem viridi compellere hibisco.* (*Virg. Ecl. ii. 30.*) *To lead the flock to the green mallows*; or, *to drive the flock with a green rush or twig.* The sentence, (*Il. iv. 306.*)

Ὅς δ'ε κ' ἀνήρ ἀπὸ ὧν ὀχέων ἕτερ' ἄρμαθ' ἴκηται,

Ἐγγυ ὀρεξάσθω: probably owes its difficulty to

our ignorance, rather than to any obscurity in the language of the poet.

The clause, *Dum pelago desævit hyems*, (*Æn.* iv. 52.) when not limited and explained by its context, may signify, *While the storm is raging*; or, *Till the storm cease*. Thus also, *Nec, dum desæviat ira, expectat.* (*Luc.* v. 303.)

Οὐρῆας μὲν πρῶτον ἐπώχετο: (*Il.* i. 50.) i. e. *He first attacked the mules*; or, according to some critics alluded to by Aristotle, *the sentinels*.

Again: *Every shepherd tells his tale*, is by itself ambiguous: the context fixes the meaning to be, is engaged in his evening employment of *counting over his sheep*.

Lumina morte resignat; closes or uncloses. (*Æn.* iv. 244.)

Ambiguity is also occasioned when a word or clause admits of a variety of construction, or of punctuation; as, *Μαχεσάμενοι ἐπὶ πλιῦν ἢ πρότερον ἐσώθησαν.* (*Her.* v. 120.) *After having fought more strenuously than before, they were vanquished*; or, *after having fought, they were more decisively vanquished than on the former occasion*. This frequently occurs in the use of negative and exceptive particles: as, *The cavalry only proceeded to the neighbouring village*; that is, either *the cavalry alone, without the infantry*; or else, *the cavalry proceeded no further than to the neighbouring village*.

4. The *ungrammatical* expressions of the illiterate are not real propositions; nor are any combinations of words in which there is not a distinct subject, predicate, and copula, either expressed or obviously implied. *A word to the wise*, is mutilated and incomplete in form, but not in sense. The same ellipsis is adopted in the Latin, *Verbum sat sapienti*. The corresponding French proverb is complete in

form as well as in sense, *Le sage entend a demot.*

Quare, ea demum Propositio legitima censetur, quæ juxta definitionem vulgatam, est *Oratio Indicativa, congrua et perfecta, verum vel falsum significans, sine ambiguitate.*

This definition is of a mixed nature: It would have been more accurate if limited to the strictly logical definition, *a declarative sentence.* The property ought not to form a part of the definition, but to be deduced from it. The prohibition of ambiguous, ungrammatical, and imperfect sentences, constitutes a highly important rule, or inference from the definition, but should not be represented as a part of it. If a sentence be not grammatical, entire, and of a determinate sense, it cannot be *declaratory.*

§. 2. *Propositionum Species.*

EJUS Divisiones variæ sunt.

PROPOSITIONS are divided according to their	}	Substance,	{	Categorical, . .	{	Pure.
		into		Hypothetical, .		Modal.
		Quality,	{	Essential, into	{	Conditional.
namely,	Accidental, into	Disjunctive.				
Quantity,	{	into	{	Affirmative.		
				True.		
				Universal.		
				Particular.		
				Negative.		
				False.		
				Singular.		
				Indefinite.		

1. *Categorica* est, quæ enuntiat absolute; ut, *Homo est risibilis*. *Hypothetica*, quæ sub conditione; ut, *si homo est rationalis est risibilis*. *Vel dies est vel nox*.

Quod *Categorica* dicit, nihilo nexum est; quasi per se subsistens: quod *Hypothetica*, conditioni substat. Unde et hæc Divisio peti dicitur a *Substantiâ* Propositionis; et per ejus membra respondetur interroganti, *Quæ est Propositio?*

Categorica rursus dividitur in *Puram* et *Modalem*. *Hypothetica* in *Conditionalem*, *Disjunctivam*, &c. *Categorica* pura, sive *Propositio de inesse*, est quæ pure affirmat vel negat; i. e. simpliciter dicit Prædicatum inesse, vel non inesse, subjecto; ut, *Homo est animal*. *Homo non est lapis*. *Modalis*, quæ cum *Modo*, h. e. vocabulo exprimente quomodo Prædicatum insit subjecto; ut, *Necesse est hominem esse animal*. *Impossibile est hominem esse lapidem*. De *Categoricâ purâ*, et quidem solâ, impræsentiarum loquor; de cæteris alibi dicitur.

1. *Pure Categorical Propositions* consist of a simple affirmation or denial, without any condition or qualifying expression, as,

Order is the life of despatch.

Affected despatch is a most dangerous thing.

Some of the wiser heathens discerned the absurdity of polytheism.

Some authors are not perspicuous.

Nemo est ab omni parte beatus.

Is, quisquis est, qui moderatione et constantid quietus animo est, sibi que ipse placatus, ut nec tabescat molestiis, nec frangatur timore, nec sitienter quid expetens ardeat desiderio, nec alacritate futili gestiens deliquescat, is est sapiens, is est beatus.

These propositions purely declare the existence or non-existence, in the subject, of the quality, character, or imaginary abstract nature, denoted by the predicate. In the last example, (which contains two propositions,) the quality of *being a wise man*, and that of *being a happy man*, are respectively asserted to be attached to the subject, *is qui moderatione, &c.* The preceding proposition declares that the attribute, *enjoying perfect happiness*, does not exist in *any man*. Thus again the aggregate idea of, *persons discerning the absurdity of polytheism*, is included in, and forms a part of, the idea expressed by, *some of the wiser heathens*. Hence such sentences are known by the barbarous name, propositions *de inesse*; that is, denoting the *in-being* of the idea of the predicate *in* that of the subject.

2. *Modal Categorical Propositions* have the affirmation or negation qualified or modified by some words expressing necessity, possibility, impossibility, probability, or improbability.

De quo omnium natura consentit, id verum esse necesse est.

Corpus mortale interire necesse est.

It was necessary that the patterns of things in the heavens should be purified with these: but the heavenly things themselves with better sacrifices than these.

Riches may possibly be applied to the best of purposes.

It is not possible that an unholy man can enter heaven.

It is impossible to check the wanderings of thought.

Fortune probably depends more on external accidents than on human sagacity.

It is obvious that such propositions may be considered as *pure* categoricals. For the sense of the word by which the mode is expressed may be conveyed by joining a corresponding adverb to the predicate; or the modal word itself may be considered as the predicate, the leading portion of the sentence being the subject. Thus it may be said, *Corpus mortale est res-necessario-interitura*; or, *Corpus mortale interire est res-necessaria*. *The application of riches to the best of purposes is a thing possible. That fortune depends more on external accidents than on human sagacity is a probable fact.*

3. *Conditional Hypothetical Propositions* are complex sentences composed of two categoric propositions connected by a particle denoting a supposition. They do not actually assert or deny any thing, except the fact of the dependence of one of the propositions on the other: as,

Ambitious men, if they be checked in their desires, become secretly discontent.

Cum consequens aliquod falsum est, illud cujus consequens est non potest esse verum.

4. *Disjunctive Hypothetical Propositions* consist of a combination of categoric propositions, so connected by disjunctive or distributive particles as to imply that one of those propositions alone is true and the others are false: as,

Aut Epicurus, quid sit voluptas, aut omnes mortales, qui ubique sunt, nesciunt.

Either your brethren have miserably deceived us, or power confers virtue.

This globe must either be destroyed or stand eternally.

2. *Affirmativa, est cujus Copula affirmativa est; ut, Homo est animal. Non progredi est*

regredi. *Negativa*, cujus negat; ut, *Homo non est lapis.* *Nullus avarus est dives.* *Vera*, quæ quod res est dicit; ut, *Homo est animal.* *Falsa*, quæ secus; ut, *Homo est lapis.* Et cum per hasce species bene respondeatur interroganti, *Qualis est Propositio?* (respondent enim per Differentiam et Proprium quæ in quale prædicantur) dicuntur hæ duæ divisiones peti a *Qualitate Propositionis.* Prior a *Qualitate Vocis*, sive *Essentiali*; Posterior a *Qualitate Rei*, sive *Accidentariâ.*

The primary quality or logical difference of Propositions consists in being *declaratory*:—the chief secondary or subordinate quality, that is, the logical property, consists in *the necessity of expressing what is true or false.*

Propositions admit of two distinct classifications corresponding with these two kinds of quality.

1. The classification which originates in the logical difference is into *affirmative* and *negative* propositions. These terms therefore denote the *essential* quality; affirmation or negation being the distinguishing or characteristic part of the *essence* (or *imaginary abstract nature*) of propositions. This is also called the quality of the *word* or the *expression*, because it has immediate reference to the form in which they are expressed. Thus, *The soul is immortal*; *The soul is not mortal*; although they convey the same meaning, differ in *essential quality*; the former being *affirmative*, the latter *negative.*

The *essential* quality of a proposition is determined by the *copula.*

The following are *affirmative propositions*; because their extremes are united and compared by means of the affirmative copula.

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Extraordinary expense should be limited by the worth of the occasion.

All philosophers profess to aim at the discovery of truth.

Some of the primitive rocks contain metallic ores.

In *Negative Propositions*, on the other hand, the adverb of negation forms part of the Copula: as,

A modest man cannot allege his own merits.

No man can excel in every branch of science.

Costly followers are not to be liked.

No man can obtain great advantages who is afraid of petty inconveniences.

Some plants will not grow out of their native soil.

A proposition is not negative unless the particle of negation immediately affects the copula. The following propositions are therefore affirmative:

I will provoke you to jealousy by them that are no people, (ἐπ' οὐκ ἔθνευ.)

Secuta est honestam causam non honesta victoria.

Non injussa cano: I sing things-not-uncommanded. (Virg. Ecl. vi. 9.)

Οὐ δίκαια δρᾶς. Thou doest things-not-just. (Soph.)

Sententia sæpe acutæ non acutorum hominum sensus prætervolat. (Cic. de Orat. iii. 223.)

Omnes insipientes sunt non sani. (Cic. Tus. Qu. iii. 5.)

Χάρις γὰρ οὐκ ἄτιμος ἐργασται πόνων. A not inglorious recompense of their toils is accomplished. (Æsch.)

He that eateth not, to the Lord he eateth not.

Ἀπειδοκίμασαν τὴν τῆς Λευκάδος οὐ περιτείχιον. (Thuc.)

Αἰτία τοῦ πολέμου ἦν τοῦ φόρου ἢ οὐκ ἀπόδοσις. (Thuc.)

Nova in rempublicam merita non usitatis vocabulis honoranda. (Tac. Ann. xi. 25.)

He who is not dishonest deserves our esteem.

It may occur that a proposition, which by itself would be rightly deemed negative, is in the course of an argument employed affirmatively; as if, after

having laid down the last position, it should be added, *But the neighbouring miller is not dishonest; he therefore deserves our esteem*; the former of these two propositions must in this connexion be accounted affirmative, the negative particle being used solely to qualify the predicate *dishonest*; q. d. *The neighbouring miller is a not-dishonest man*. The sentence Οὐδείς ἀνθρώπων ἀδικῶν τίσιν οὐκ ἀποτίσει· if οὐκ is considered as combined with the verb, is negative: if otherwise, it is affirmative. (*Herod. v. 56.*)

Some propositions are of a mixed nature; consisting of an affirmative which comprises a negative; or of a negative comprising an affirmative. For instance, *Man alone destroys those of his own species*; that is, both, *Man destroys his own species*; and, *No other creatures destroy those of their own species*. *I did not strike him intentionally*; that is, *I did strike him*; and, *I did it not intentionally*.

Τῶν μὲν γυν ἐν Θεσσαλίῃ ποταμῶν, Ὀνόχωνος μόνος οὐκ ἀπέχρησε τῇ στρατιῇ τὸ ῥέεθρον, πινόμενος. (*Herod. vii. 196.*)

2. The classification of propositions into *true* and *false* flows from the property, which is the secondary attribute; and is therefore called the *accidental quality*. And because this quality refers to the sense and meaning of the sentence, it is also called the quality of the *thing*.

To ascertain the truth or falsehood of a proposition is not the office of Logic, but of that science to which the subject-matter of the proposition belongs: as, *The sun is a mass of ice*. *The sun is an entire globe of fire*. *The sun is composed of ignited matter*. *Pride is wholly sinful*. *Some kinds of pride are honourable and right*. *Basalt is of igneous origin*. *Basalt is of aqueous origin*.

When the term *quality*, in reference to propositions, is employed without any distinguishing epi-

thet, the *essential* quality, or affirmation and negation, is signified.

3. *Universalis*, est quæ subicit terminum communem (cum signo universali, *omnis*, *nullus*, &c. adeoque) pro universis suis significatis distributive sumptum. *Particularis*, quæ terminum communem (cum signo particulari, *aliquis*, *quidam*, &c. adeoque) ex parte tantum significantem. *Singularis*, quæ vocem (vel sponte, vel ex signo saltem) Individuam; ut, *Socrates legit*. *Hic homo est doctus*. *Indefinita*, quæ (terminum communem sine signo, et proinde) ancipitem: nam, manente formulâ, vim recipit diversam; ut, *Homo est animal*, nempe *omnis*: *Homo est doctus*, *aliquis* scilicet.

Petitur hæc Divisio a *Quantitate* Propositionis; nempe numero eorum pro quibus subjectum supponit: unde et per has species bene respondetur interroganti, *Quanta sit Propositio?*

The quantity of a proposition depends on the extent in which its subject is applied. If the subject signifies some one object only, the proposition is *singular*. If it is a word signifying many things, (that is, a common noun,) and is so employed as to denote them all, the proposition is *universal*. If the subject signifies many, but is by some adjunct limited to a portion of them only, the proposition is *particular*. If the extent of the subject is to be known only by the sense, and not from the form of the expression, the proposition is *indefinite*.

A term, whether it be subject or predicate, is said to be *distributed* or *universal*, when it is used in its widest extent, and applied without limitation to every individual signified by it. But when limited to a portion of the aggregate of individuals which it signifies, the word is said to be *undistributed*, *partial*, or *particular*.

1. *Universal Propositions* have an *universal* subject. Thus, *all crystals are angular*, predicates *angularity* of every individual thing comprehended under the subject *crystal*. The same is true in the following examples :

All the metals are fusible by heat.

Every intelligent being is responsible for his conduct.

No bad consequences can eventually proceed from compliance with the laws of our country.

There does not exist a man who is not ignorant on some useful topic.

All men think all men mortal but themselves.

No human foresight can check the advance of old age, infirmities, and death.

2. *Particular Propositions* have the subject limited to a part of its entire extent; thus, *some diseases are incurable*; where *incurableness* is attached not to all, but only to a certain portion of *diseases*.

Some men of deep erudition confine their knowledge to their own breasts.

Several useful opportunities have been neglected.

Many have raised fortunes at the hazard of their lives.

Most arbitrary monarchs are revengeful.

Few men in this period of universal knowledge attain to literary eminence.

Almost all the poets have been unfortunate.

Very many stars have doubtless not yet been discovered by the best instruments.

There are scarcely any who are not under the influence of some prejudices.

In all these examples of particular propositions the subject is a common term applied to a portion only of the individuals to which the name belongs.

The combination of the universal sign with the negative particle renders a proposition indefinite, or ambiguous as to its extent; since that form is employed sometimes in an *universal*, and sometimes in a *particular* sense. In the following sentences it denotes universality:

Non omnia possumus omnes.

Πᾶς γὰρ ἀνὴρ πενίη δεδημημένος οὔτε τι εἰπεῖν
οὔθ' ἔρξαι δύναται. (Theogn. Γνωμ. 173.)

Ἐξ ἔργων νόμου οὐ δικαιωθήσεται πᾶσα σὰρξ.

Πᾶς ἀνθρωποκτόνος οὐκ ἔχει ζωὴν αἰώνιον.

Πᾶσα προφητεία γραφῆς ἰδίας ἐπιλύσεως οὐ γίνεται.

All they that put their trust in him shall not be destitute: where the translation in our Bible is, None of them that trust in him shall be desolate.

In the following examples the same combination is applied in a limited or *particular* signification;

All men have not faith.

All is not gold that glitters.

Οὐ πάντα τὰ κακὰ φοβεῖται.

Non omne mare est generosæ fertile testæ.

Ὅσων μὲν οὖν ἐφίενται τινες οὐ πάντα ἀγαθὰ ἔστι.

Οὐ πάντες χωροῦσι τὸν λόγον τοῦτον.

Πάντες μὲν οὐ κοιμηθησόμεθα.

Neque enim singulare est quicquid unum dici potest.

The natural order would be, *not all men have faith; not every thing which glitters is gold; not every thing which can be called one is singular.* And these forms are equivalent to, *some men have not faith; some things which glitter are not gold; some things which may be called one are not singular.*

3. *Singular Propositions* are characterized by a subject which signifies a *singular* or *individual* thing; as,

London is the glory of our country.

Noah's ark contained animals of every species.

The House of Commons represents the whole commonalty of the realm.

The King, Lords, and Commons, form a British Parliament.

His Majesty went to the House of Lords.

I am anxious to do good to my neighbours.

Two and two makes four.

This question has too long engaged our attention.

Petty operations incessantly continued in time surmount the greatest difficulties.

In the last example the subject denotes *the aggregate of successive operations*. So the expression, *two and two*, signifies *the amount of two and two*.

A proposition the subject of which is an *abstract* term is most correctly considered as *singular*: as,

Virtue is her own reward.

Pride was not made for man.

Life is a vapour.

Happiness does not consist in greatness.

The subjects, *Virtue, Pride, Life, Happiness*, represent each a *single* abstract idea or aggregate of ideas, and therefore they are *singular* words.

The Syncategorem *all*, when used *distributively*, is a sign of an *universal* proposition; when it is applied *collectively*, the proposition is *singular*. When it is *distributive*, its place may be correctly supplied by *every* or *each*: when *collective*, it admits of the introduction of the word *together*.

All the Colleges are governed by their respective statutes; i. e. each of the Colleges is so governed.

All the Colleges constitute an University; i. e. all together, collectively taken.

All the allied troops fought courageously.
All the allied troops formed a noble army.
All the known primary planets revolve in elliptic orbits about our sun as their centre.
All the known primary planets are eleven.

4. *Indefinite Propositions*, having for their subject a common term without any sign either of universality or of limitation, are ambiguous as to their extent. They convey no intimation whether the subject denotes *all* or *a part only* of the individual things to which the word is applicable: as,

A man improves more by reading the story of a person eminent for prudence and virtue, than by the finest rules of morality.

Tragical representations of human woe make a deep impression on the heart.

The virtues confer a superior grace on their possessors.

The productions of a great genius, with many lapses and inadvertencies, are infinitely preferable to the more exact and correct works of an inferior author.

Errors are marks of infirmity.

Errors creep into the most prudent undertakings.

Such propositions are ambiguous, and it is the office of common sense, guided by an acquaintance with the branch of science to which the proposition relates, or the connexion in which it occurs, to decide upon the extent in which the subject is to be taken. One of the qualities, for instance, which is above predicated of *errors*, namely, that they are *marks of infirmity*, belongs to the subject *universally*; for *all errors* are such. The other predicate, however, *creep in to the most prudent undertakings*, can only be said of *some errors*. This is therefore a particular, the former an universal proposition.

Indefinite propositions may be distinguished from

singular propositions by the following characteristic. Every *indefinite* proposition will admit of some sign, either universal or particular: but a *singular* proposition will not receive either. The following are therefore not indefinite but singular:

The English are the sovereigns of the ocean.

The heavenly bodies form one harmonious system.

It cannot be correctly said, *Every Englishman is*, or *Some Englishmen are the sovereigns of the ocean*; *Each of the heavenly bodies*, or *Some heavenly bodies form one system*. The subjects are collective, and therefore denote *individual* things or notions.

Although abstract subjects constitute singular propositions, as has been already stated, yet they may sometimes be considered as implying a distribution, and in this case the propositions in which they occur will be indefinite. Thus, in the sentence, *Pride was not made for man*, the subject may be taken *distributively* for each *kind* or *sensation* of pride; *No pride* (i. e. *no species*, or *no feeling of pride*) *was made for man*. Sometimes a particle occurs in the course of a proposition, which fixes the extent of the subject; thus the sentence, *Emulation has sometimes a good, and sometimes a bad tendency*, may be inaccurately used to signify, *Some kinds of emulation are of good tendency; and some kinds of a bad tendency*.

Hanc doctrinam Scholastici hujusmodi carmine sunt complexi;

Quæ? Ca. vel Hyp. Qualis? Ne. vel Aff.
Quanta? Uni. Par. In. Sing.

This compression of the substance of the chapter in a harsh verse is intended to aid the memory. The division derived from the accidental quality is not introduced, because it is not strictly logical.

§. 3. *De Terminorum Distributione.*

PROPOSITIO Singularis in Syllogismo æque potest Universalis. Nam subjectum ejus supponit pro omni suo significato. *Socrates est homo*, Universalis est, quia omnis ille Socrates tantum unus est. Indefinitæ quantitas judicatur ex materiâ propositionis, sive habitudine connexionis extremorum, quæ triplex est; 1. *Necessaria*, quando extrema essentialiter conveniunt; 2. *Contingens*, quando accidentaliter tantum; 3. *Impossibilis*, quando essentialiter differunt. Unde Propositio Indefinita pro Universalis habetur, in materiâ impossibili et necessariâ; pro Particulari vero, in contingenti.

The fourfold division of Propositions into universal, particular, singular, and indefinite, may be conveniently simplified. So far as relates to their use in argument, *singular* propositions have the same characteristic as *universals*; namely, the subject is not limited by any adjunct or sign; it does not signify a portion out of a larger number, but extends to every individual thing which the word signifies. Thus, in *Senatus decrevit*; *One night elapsed*; *The king is returned*; *Erupit Catalina*; the subjects include every thing which the words themselves can include; and therefore they may (by a catachresis) be said to be *distributed*.

Indefinite propositions are also, as has been already stated, equivalent either to universals or to particulars, according to their signification, or to the mutual relation and bearing of the subject and predicate, which is termed the *matter* of the proposition;

and which must be either *necessary, impossible, or contingent.*

1. When the predicate is *necessarily* true of the subject, the proposition is in signification *universal*, and wants only the *sign* to render it formally so. Of this nature are the following:

Human plans, however well laid, are liable to disappointment; that is, All human plans.

Exaggerated commendations defeat their own purpose by exciting suspicion; that is, All exaggerated commendations.

2. If the predicate be wholly incompatible with the subject, and the extremes thus *essentially differ*, in this case also the proposition will be equivalent to an universal: thus,

The most prudent of human plans are not sufficient to ensure success; that is, No human plans, even the most prudent, are sufficient, &c.

Old soldiers do not willingly venture beyond the verge of experience; that is, No old soldiers venture, &c.

Brutes neither eat nor drink more than nature requires; that is, No brutes, &c.

3. But if the proposition, whether affirmative or negative, be such that the predicate may be asserted of some things comprehended in the subject, and denied of others; that is, if its extremes only *accidentally* agree or differ; it is in sense a *particular* proposition. Thus,

Victories have been gained under every circumstance of disadvantage; that is, Some victories.

While brutes neither eat nor drink more than nature requires, men degrade themselves by excess even below the level of the brutes; that is, Some men degrade themselves.

Quare, Quantitas Propositionis, quatenus ad Syllogismum facit, est duplex: *Universalis* et

Particularis. Et nota, quod Universalis affirmans symbolum habet A; negans E: Particularis affirmans symbolum I; negans O.

Asserit A; negat E: Universaliter ambæ.

Asserit I; negat O: sed Particulariter ambo.

In Universali, signum affirmans distribuit tantum Subjectum: Negans, etiam Prædicatum. Nam ut verum sit *Omne a est b*, sufficit aliquod *b* convenire omni *a*: sed falsum est *nullum a esse b*, si vel aliquod *b* conveniat alicui *a*. Eodem argumento, ut sit verum *Aliquod a est b*, sufficit si vel aliquod *b* conveniat alicui *a*: sed falsum est quod *aliquod a non est b*, nisi illud *a* differat a quovis *b*. Et proinde

In particulari, nullus terminus distribuitur, præter negantis prædicatum, quod semper distribuitur.

Universal affirmative propositions distribute the subject only:

Universal negatives distribute both the subject and predicate:

Particular affirmatives distribute neither the subject nor the predicate:

Particular negatives distribute the predicate alone.

The following scale therefore represents the extent of the extremes in each kind of propositions.

A.	Distrib.	x
E.	Distrib.	Distrib.
I.	x	x
O.	x	Distrib.

In the following examples the distributed or universal terms are distinguished by the change of type.

A.

ALL VIRTUES are habits.

Vain are ALL SUDDEN SALLIES OF DELIGHT.

OUR AFFECTIONS are liable to seduction.

THE PATIENT POOR deserve esteem.

Scribendi recte SAPERE fons est et principium.

The *subject* of the *universal affirmative* proposition is taken universally or distributively, and thus extends to every individual comprised under it. This is either formally expressed by the universal sign or syncategorem, or is to be inferred from the matter of the proposition. But the *predicates* do not necessarily denote *all* the individuals comprised under the common term, but most frequently signify only *some* of them. For instance; *All virtues are SOME habits*: there being other habits which are not virtues. *The patient poor are SOME of those who deserve esteem*, while others also may have the same predicated of them. *All sudden sallies of delight are SOME of*, but are far from *all*, the things to which belongs the character *vain*. These predicates therefore are not distributed. There is indeed in such sentences a grammatical ellipsis of the word *some*; which the idiom of the French language introduces when the predicate is expressed in the substantive form; as, *Les premiers philosophes furent DES sages appliqués à l'étude et la pratique des devoirs.*

E.

NO VICIOUS INDULGENCES are PROFITABLE.

AFFLICTIONS cannot BE PLEASING TO HUMAN NATURE.

The MISTAKE has not BEEN RECTIFIED.

NEMO MORTALIUM OMNIBUS HORIS SAPIT.

That the *subjects* of *universal negative* propositions

are distributed is evident from the sign or the matter; otherwise they could not (by the definition) be universal. But if any one individual comprised under the *predicate* be not excluded from agreement with the subject; (if, for instance, *any thing profitable* be a *vicious indulgence*; or if *any thing which can be pleasing to human nature* comes under the head of *afflictions*;) the proposition is untrue. Each individual therefore signified by the predicate is excluded; that is, the predicate is *distributed*.

I.

Some laws are obsolete.

Books are profitable companions.

There have been wars unjustly waged.

As the distributed subject is the essential characteristic (or logical difference) of universal propositions; so the *undistributed subject* is the characteristic of *particular* propositions, whether affirmative or negative. But in *affirmative* particulars, the *predicate* need not be applied to more than a *part* only of the things signified by the term. For instance, the *some laws* spoken of in the first example are only a small portion of the whole mass of things which are *obsolete*. So also, *some books* are only *some profitable companions*, they are far from *all*, or *the only profitable companions*. Therefore the predicate as well as the subject is undistributed.

O.

Some offenders are not DULY PUNISHED.

Many authors are not MEN OF ORIGINAL GENIUS.

Some men are NEVER SATISFIED.

There are creatures which are not RESPONSIBLE.

Such propositions are not true unless there be some definite number of individuals comprised under the *subject*, from which every individual

which comes under the denomination of the *predicate* is entirely excluded. Thus there is a *class of offenders*, of not one of whom it can be said that they are *duly punished*. There is a *class of authors* from which every individual *man of original genius* is wholly excluded. Consequently the predicate is *distributed*.

Quanquam igitur fieri potest, ut prædicatum distribuatur in affirmante, tamen non est necessarium; sed *per accidens* fit, et *virtute significati*, non *virtute signi*. In statuendis autem propositionum legibus, spectandum est id tantum, quod structura postulat, non quidquid sensus admittit: cum illud *essentiale*, et *perpetuum* sit; hoc *mutabile*, et *incertum*.

Such a distribution of the predicate takes place whenever it is a definition of the subject; or expresses its logical difference; or a species of it; or a property of the first, third, or fourth kind. The following propositions are examples:

Rhetoric is the art of speaking persuasively.

All men are rational.

All propositions must be either true or false.

Some mathematical figures are triangles.

Some men are skilful astronomers.

George the Fourth is King of England.

The wicked shall fall by his own wickedness.

The better part of valour is discretion.

The predicate in affirmative propositions is occasionally and accidentally distributed. This distribution of the predicate should not however be allowed to affect an argument. To draw an inference grounded on that circumstance is at least injudicious, if not absolutely inaccurate; because it supposes something to be known which is not *made*

known by the propositions laid down, but must be derived *ab extra*. There is not, for example, any thing in the form or expression of the sentences, "Ἔστιν ἡ ἀρετὴ ἠθικὴ μεσότης, Μεσότης ἔστιν ἡ ἀρετὴ, which intimates that the predicate is distributed in the one rather than in the other, although in fact it is distributed in the former and not in the latter. To infer from the latter that *because all virtue is to be chosen for its own sake, and every virtue consists in a medium, therefore every medium is worthy to be chosen for its own sake*, would be manifestly erroneous. But to infer from the former, by a similar process, that *the due medium as to moral conduct is worthy to be chosen for its own sake*, would be equally illogical and erroneous as to form, and could carry conviction to those alone who, from previous acquaintance with the subject, know that the predicate ἠθικὴ μεσότης is *accidentally* distributed; since the proposition itself does not render that distribution necessary. The Greek language indeed affords a facility for expressing the distribution of the predicate in universal affirmatives, of which our language is destitute; namely, by prefixing the article to each extreme, by which means the proposition is rendered reciprocal. Thus, Ἔστιν ἡ ἀρετὴ ἡ ἠθικὴ μεσότης, signifies at once, *Virtue is that medium which relates to moral conduct*; and, *Whatever is a medium relating to moral conduct is virtue*; in other words, it denotes the predicate to be distributed.

Hæc igitur regula generalis esto, quod in propositione A, subjectum tantum distribuitur; in O, tantum prædicatum; in I, neutrum; in E, utrumque.

The substance of the doctrine of distribution may be thus stated:

Universal Propositions necessarily require a distributed or universal subject: Particulars require an undistributed or particular subject.

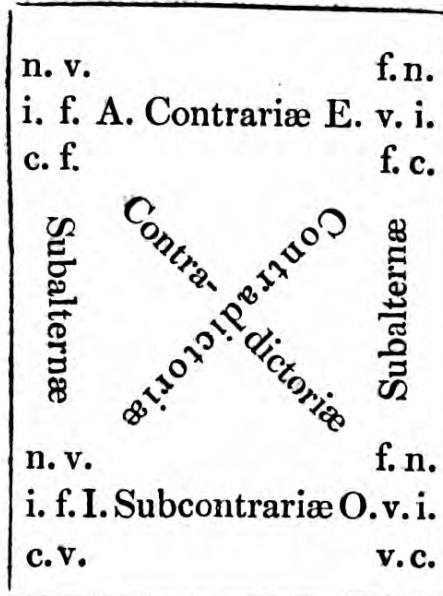
Negative Propositions require a *distributed predicate*, but *Affirmatives* may have the *predicate undistributed*.

§. 4. *De Propositionum Oppositione.*

PROPOSITIONIBUS accidunt *Oppositio* et *Conversio*. *Opponi* dicuntur duæ, quæ, cum subjecta habeant et prædicata omnino eadem, *Quantitate* tamen, vel *Qualitate* vocis, vel utrâque pignant.

Oppositionis doctrina tota colligitur et demonstratur ex ap-

posito Schemate, in quo, A. E. I. O. sunt quatuor Propositiones quantitate suâ et qualitate signatæ: quæ sunt *v. f.* (hoc est, *veræ* vel *falsæ*) pro materiâ *n. i. c.* (hoc est, *necessariâ*, *impossibili*, *contingen-*



te;) quod ex ipsâ materiæ definitione satis patet. De *necessariâ*; quia Propositionis extrema in eâ essentialiter conveniunt: de *impossibili*; quia in eâ essentialiter differunt: de *contingenti*; quia secus non esset materia contingens. Inspecto igitur hoc Schemate facile est,

1. Oppositionis *species* numerare; quæ sunt vulgo quatuor; *Contradictoria, Contraria, Subcontraria, Subalterna.*

2. Singularum definitiones conficere. V. g. *Oppositio Contradictoria, est inter (A. O. vel E. I. hoc est) duas Categoricalas quantitate pariter et qualitate pugnantes. Contraria, inter (A. E. h. e.) duas universales qualitate pugnantes &c.*

3. Oppositarum Canones quatuor eruere et demonstrare hunc in modum.

1. Contradictoriæ A. O. vel E. I. sunt in nullâ materiâ simul veræ; in nullâ simul falsæ; sed in quâcunque una vera, falsa altera.

Sed notandum est, ad Contradictionem requiri quatuor: nempe loqui de eodem, 1. *eodem modo*; 2. *secundum idem*; 3. *ad idem*; 4. *in eodem tempore*; quarum conditionum si defuerit aliqua, possunt *Est* et *Non est* inter se bene convenire. E. g. 1. *Cadaver hominis est et non est homo: Est enim homo mortuus: Non est homo vivus.* 2. *Zoilus est et non est niger: Est enim crine ruber, niger ore.* 3. *Socrates est et non est comatus: nempe est, ad Scipionem, non est ad Xenophontem comparatus.* 4. *Nestor est et non est senex: Est enim, si de tertiâ ejus ætate, non est, si de primâ loqueris.*

2. Contrariæ A. E. in nullâ simul veræ; in Contingenti, simul falsæ; in ceteris, una vera, falsa altera; nempe in Necessariâ, vera A, falsa E; in Impossibili, vera E, falsa A.

3. Subcontrariæ I. O. in Contingenti, simul veræ; in nullâ simul falsæ; in Necessariâ, vera I, falsa O; in Impossibili, vera O, falsa I.

4. Subalternæ A. I. vel E. O. et simul veræ, et simul falsæ, et una vera, falsa altera, esse possunt. Nam in Necessariâ, simul veræ sunt A. I; in Impossibili, simul veræ E. O; in eâdem, simul falsæ, A. I. et in Necessariâ, simul falsæ E. O; in Contingenti, (propter A. E. falsas, I. O. veras) A. I. vel E. O. sunt una vera, falsa altera.

Opposition of propositions consists in the difference between any two categorical propositions which are composed of the same terms, but vary from each other in *quantity* only, (namely, when one is universal and the other particular,) or in *essential quality* only, (when one is affirmative and the other negative,) or in both *quantity* and *quality*.

1. *Contradictory Opposition* is that which subsists between two pure categorical propositions, differing both in *quantity* and *quality*; so that if one is universal affirmative, the other must be particular negative: or if the one be universal negative, the other must be particular affirmative; and *vice versâ*: as, *All men are responsible; Some men are not responsible. No soldiers are cowards; Some soldiers are cowards.*

2. *Contrary Opposition* is between two universal propositions, differing in *quality*; as, *All trees possess vegetable life; No trees possess vegetable life.*

3. *Subcontrary Opposition* subsists between two particular propositions, differing in *quality*; as, *Some minds are clouded by prejudice. Some minds are not clouded by prejudice.*

4. *Subaltern Opposition* takes place between any two propositions which differ in *quantity* only; as, *All human laws are imperfect; Some human laws are imperfect. No men have an affectionate disposition; Some men have not an affectionate disposition.*

The *accidental quality* of propositions, that is, their truth or falsehood, does not depend on their *opposition* or on any other mutual relation, but solely on their matter or actual signification.

If an attribute or predicate is *universally* connected with any subject; the *assertion* of that connexion, either universally or partially, must be true; and the *denial* of it, either universally or partially, must be false. In other words, in *necessary* matter, A and I are true; E and O are false. Thus, *All plants are organized bodies, Some plants are organized bodies*, are true propositions: *No plants are organized, Some plants are not organized*, are false.

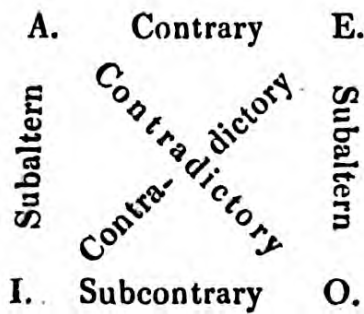
But if two terms are so related to each other, that the idea expressed by the predicate cannot enter into the subject; to *assert*, either universally or partially, that it does belong to that subject is false; whereas, to *deny* it of the subject, whether universally or partially, is true. That is, in *impossible* matter, A and I must be false; E and O must be true. Thus it is false that, *All granite is a malleable substance*, and that, *Some granite is malleable*: but it is true that, *No granite is malleable*, and that, *Some granite is not malleable*.

Again, if any attribute or quality exists in one portion of the individuals denoted by the subject and not in others, it is false either to assert or to deny that predicate concerning the subject *universally*; but to assert or deny it *partially* will be true. That is, in *contingent* matter, *universal* propositions (A and E) are false; *particular* propositions (I and O) are true. For instance, it is false that *All birds are rapacious*; but true that *Some birds are rapacious*.

It is false also that *No birds are rapacious*, but true that *Some birds are not rapacious*.

The application of these principles to the doctrine of *opposition* is represented in the following tabular arrangements and examples.

N. v. *All fowls are birds.* N. f. *No fowls are birds.*
 I. f. *All fowls are dogs.* I. v. *No fowls are dogs.*
 C. f. *All fowls are hens.* C. f. *No fowls are hens.*



N.v. *Some fowls are birds.* N.f. *Some fowls are not birds.*
 I. f. *Some fowls are dogs.* I. v. *Some fowls are not dogs.*
 C. v. *Some fowls are hens.* C. v. *Some fowls are not hens.*

A.

All the fixed stars are luminous bodies.
They are all formed by human ingenuity.
They are all discernible by the naked eye.

E.

None of the fixed stars are luminous bodies.
No stars are formed by human ingenuity.
They are not discernible by the naked eye.

I.

Some fixed stars are luminous bodies.
Some of them are formed by human ingenuity.
Some are discernible by the naked eye.

O.

*Some of the fixed stars are not luminous bodies.
 Some fixed stars are not formed by human ingenuity.
 There are some of them which are not discernible by
 the naked eye.*

OPPOSITION.	Contradictory,	Between A. & O.	$\left. \begin{array}{l} \text{A. O.} \\ \text{N. true . false.} \\ \text{I. false . true.} \\ \text{C. false . true.} \end{array} \right\}$
		Between E. & I.	$\left. \begin{array}{l} \text{E. I.} \\ \text{N. false . true.} \\ \text{I. true . false.} \\ \text{C. false . true.} \end{array} \right\}$
	Contrary,	Between A. & E.	$\left. \begin{array}{l} \text{A. E.} \\ \text{N. true . false.} \\ \text{I. false . true.} \\ \text{C. false . false.} \end{array} \right\}$
		Between I. & O.	$\left. \begin{array}{l} \text{I. O.} \\ \text{N. true . false.} \\ \text{I. false . true.} \\ \text{C. true . true.} \end{array} \right\}$
	Subaltern,	Between A. & I.	$\left. \begin{array}{l} \text{A. I.} \\ \text{N. true . true.} \\ \text{I. false . false.} \\ \text{C. false . true.} \end{array} \right\}$
		Between E. & O.	$\left. \begin{array}{l} \text{E. O.} \\ \text{N. false . false.} \\ \text{I. true . true.} \\ \text{C. false . true.} \end{array} \right\}$

1. The opposition between *Contradictory* propositions is perfect; since they differ in every respect. Consequently they cannot be both true, or both false together.

The four requisites to a complete contradiction may be comprised in one rule, which is equally applicable to all the species of opposition; namely, *The terms must be employed in the same sense in both the opposing propositions.* For this rule includes the necessity of their being asserted of the same thing, in the same *manner*, in relation to the same *object*, in *comparison* with the same, and at the same *time*.

2. *Contrary* propositions cannot be both *true* together; but may be either both *false*, or the one *false* and the other *true*.

Singular propositions cannot, in strictness of speech, be *contradicted*; for their quantity cannot be changed. But the *contrary* to a singular proposition affords as perfect an opposition as the contradiction between universals and particulars. For, the matter of a singular proposition cannot be *contingent*; and in necessary and impossible matter contraries cannot be either both true or both false together.

3. *Subcontrary* propositions cannot be both *false*; nor can they be both *true* except in *contingent* matter. The very definition of *contingent* matter requires that it should be such as to allow the predicate to be at the same time asserted of some things comprised under the subject, and denied of others.

4. *Subaltern* propositions may be both *true*, or both *false*; or the universal *false*, and the particular *true*. The universal proposition is called *subalternans*; the particular, *subalternate*. The relation between them is scarcely to be called *opposition* in the common acceptance of the word, though it comes

within the range of the definition which has here been given of that term.

If an universal proposition is true, the correspondent particular is also true.

If the particular is false, the corresponding universal must be false likewise.

If an universal is false, or a particular true, the proposition subalternately opposed to it may be either true or false.

Examples in Necessary Matter.

A. All human institutions are imperfect.	}	v.	{	Contrary to E.
				Subalt. to I.
E. No human institutions are imperfect.	}	f.	{	Contrad. to O.
				Contrary to A.
I. Some human institutions are imperfect.	}	v.	{	Contrad. to I.
				Subalt. to O.
O. Some human institutions are not imperfect.	}	f.	{	Subalt. to A.
				Contrad. to E.
				Subcont. to O.
				Contrad. to A.
				Subalt. to E.
				Subcont. to I.

Impossible Matter.

E. None of the planets are stationary.	}	v.	{	Subalt. to O.
				Contrary to A.
O. Some of the planets are not stationary.	}	v.	{	Contrad. to I.
				Subalt. to E.
A. All the planets are sta- tionary.	}	f.	{	Contrad. to A.
				Subcont. to I.
I. Some planets are sta- tionary.	}	f.	{	Contrary to E.
				Contrad. to O.
				Subalt. to I.
				Contrad. to E.
				Subcont. to O.
				Subalt. to A.

Contingent Matter.

I. <i>Some wars are just. . . .</i>	} v.	{	Subcont. to O.
			Subalt. to A.
O. <i>Some wars are not just.</i>	} v.	{	Contrad. to E.
			Subcont. to I.
A. <i>All wars are just. . . .</i>	} f.	{	Contrad. to A.
			Subalt. to E.
E. <i>No wars are just. . . .</i>	} f.	{	Subalt. to I.
			Contrad. to O.
			Contrary to E.
			Contrad. to I.
			Subalt. to O.
			Contrary to A.

Possunt etiam aliter hi Canones Oppositarum, cum pluribus aliis, tum hoc quoque modo demonstrari.

1. Contradictoriæ A. O. vel E. I. nec *simul veræ* nec *simul falsæ* esse possunt. Quod enim una negat, idem altera de eodem, secundum idem affirmat: Id vero fieri nec natura patitur, nec sensus ipse communis. Quare,

α. Si universalis vera sit, particularis, quæ sub eâ continetur, vera est. Et

β. Si particularis falsa sit, universalis, quæ eam continet, falsa est: Quoniam enim subjectum in universali distribuitur, fit, ut in eâ, et in particulari, idem, de eodem, secundum idem, dicatur: vere igitur et falso simul dici, (hoc est, affirmari simul et negari) nequit.

2. Contrariæ A. E. non possunt esse *simul veræ*: sed in materiâ contingenti sunt *simul*

falsæ. Nam 1°. Exponatur universalis vera; Ergo particularis vera per 1. α ; Ergo quæ particulari contradicit falsa per 1. Sed hæc est Expositæ contraria.

2°. Exponatur universalis de materiâ contingenti; Ergo et hæc falsa est, et particularis vera, vi materiæ: Ergo quæ particulari contradicit falsa per 1. Sed hæc est Expositæ universali contraria.

3. Subcontrariæ I. O. *simul falsæ* esse non possunt: vel *simul veræ*, vel *una vera, falsa altera*, esse possunt. Sunt enim duæ duarum contrariarum contradictoriæ, ut in Schemate patet, cum contrariis decussatim comparandæ. Quare, (per 1. et 2.) subcontrariæ sunt in nullâ materiâ *simul falsæ*; quia contrariæ in nullâ *simul veræ*: subcontrariæ in contingenti *simul veræ*; quia contrariæ in eâdem *simul falsæ*. In impossibili vero, et necessariâ, eadem utrisque lex est, ut sit una vera, falsa altera.

4. Subalternæ A. I. vel E. O. et *simul veræ*, et *simul falsæ*, et *una vera, falsa altera*, esse possunt. Nam 1°. Si subalternans (nempe universalis) vera sit, subalternata (sive particularis) vera est (per 1. α .) 2°. Si subalternata falsa, Ergo subalternans falsa (per 1. β .) 3°. Si subalternans falsa, Ergo quæ illi contradicit vera (per 1.) Ergo hujus subcontraria, quæ est Expositæ subalternata, vera vel falsa esse potest (per 3.) 4°. Si subalternata vera, Ergo

quæ illi contradicit falsa (per 1.) Ergo hujus contraria, quæ est expositæ subalternans, vera vel falsa esse potest (per 2.)

This ingenious imitation of mathematical proof is needless. Its conclusions are self-evident; the argument therefore cannot afford any additional satisfaction to the mind.

A single axiom is laid down, viz. that *The same thing cannot be affirmed and denied of the same thing at the same time*; from which the whole doctrine of contradiction is at once inferred, namely, that contradictory propositions cannot be both true, or both false together.

But the foundation is not sufficiently extensive for the superstructure. The principle laid down will, indeed, authorize the conclusion that neither contradictories nor contraries can be together true; but it does not prove that contradictories cannot be false together.

The following axiom might supply its place; *It is impossible that a proposition should be at the same time and in the same sense true and not true.*

If therefore it be true that *All vicious indulgences lay the foundation of future remorse*, the same assertion cannot be untrue; it cannot be said, *Not all vicious indulgences lay the foundation of future remorse*, that is, *Some vicious indulgences do not lay the foundation, &c.* If it be true, *No virtues are ultimately injurious to men*, the assertion that *Not-no virtues, (non-nullæ virtutes,)* that is, *some virtues, are ultimately injurious*, must be false. On the other hand; if it be false that *Omnis feret omnia tellus*, it cannot be false that *Non omnis feret omnia tellus, Some countries or soils will not produce every thing.* If it be false that *Nemo mortalium est philosophus*, it cannot be false that *Non-nemo mortalium est philo-*

sophus, Some men are philosophers. Thus contradictories cannot be either true or false together.

From the same axiom it is justly inferred that *if an universal be true, the corresponding particular will also be true.* For the universal includes the particular. If *all men are mortal*, it follows that any *some men*, that is, any particular class or number of men, are mortal. To deny therefore that *some men are mortal*, would be to assert the former proposition to be at the same time true and not true.

The same would be the absurdity, if, when a particular is false, the universal is not admitted to be false likewise. If it is false that *some planets are motionless*, it must continue false when involved in the universal, *all planets are motionless.* Consequently, that universal must be also false.

By means of these primary inferences the other rules of opposition are deduced by a process which, being at once obvious and unprofitable, needs no further illustration.

§. 5. *De Conversione Propositionum.*

CONVERTI dicitur Propositio, cujus extrema transponuntur. Variis id modis fieri potest, sed præsertim duobus: 1. *Simpliciter*, quando tam quantitas, quam utraque qualitas servatur. 2. *Per accidens*, quando servatâ qualitate, quantitas mutatur.

fEcI *Simpliciter convertitur, EvA per Acci:* et conversio utrobique illativa est.

Nam 1. sit vera E, puta *Nullum A est B:* Ergo (cum uterque terminus distribuatur)

quodvis A differt a quovis B. Ergo vicissim: Ergo *Nullum B est A*. 2. Sit vera I: Ergo falsa est ejus contradictoria E: Ergo et contradictoriæ simpliciter conversa: Ergo quæ conversæ contradicit, (i. e. expositæ simpliciter conversa,) est vera. 3. Sit vera E: Ergo et ejus simpliciter conversa: Ergo et conversæ subalternata: quæ est expositæ conversa per accidens. 4. Sit vera A: Ergo et ejus subalternata: Ergo et subalternatæ simpliciter conversa: quæ est expositæ per Accidens.

Ceteræ Conversiones, cum sint partim ambiguae, partim falsæ, partim ad præcepta Syllogismorum inutiles, in Logicâ negliguntur.

Conversion of propositions consists in the transposition of the subject and predicate; as, *Metals are not earths; Earths are not metals*. When no other change takes place, the process is called *simple conversion*: but if the quantity of the proposition is altered, the process is said to be an *accidental or subordinate conversion*: as, *All earthy substances are minerals, Some minerals are earthy substances*.

Universal negative, and Particular affirmative propositions, may be *simply* converted; all Universals, whether affirmative or negative, may be converted *per accidens*.

A is converted per accidens to I.

E is converted { simply to E.
per accidens to O.

I is converted simply to I.

O cannot be converted by any of these methods.

1. *Simple conversion* requires that the extremes of the proposition should be of equal extent; that is,

either *both* distributed, as in E; or *neither* distributed, as in I. For in these cases the mere transposition of the extremes, without any alteration of the sign, does not derange the quantity of the proposition. And for this reason, its accidental quality (its truth or falsehood) continues the same. So that simple conversion partakes of the nature of an argument; since, if any proposition is true, its simple-converse must be also true: if false, its simple-converse must be false.

Since, therefore, the universal negative proposition, *No ruminating animals are carnivorous*, is true, it is also true that, *No carnivorous animals are ruminating animals*. For, both extremes being distributed, the sentence, *No ruminating animals are carnivorous*, declares that *every ruminating animal* differs from *every carnivorous animal*. Therefore reciprocally, *every carnivorous animal* differs from *every ruminating animal*: that is, *No carnivorous animal is a ruminating animal*; or as it may be more concisely expressed, *No carnivorous animals ruminates*.

On the same principle, since it is false that *No kites are birds of prey*, it is false that *every kite* differs from *every bird of prey*. It is therefore false that *every bird of prey* differs from *every kite*; that is, that *no birds of prey are kites*.

The following are instances of the conversion of true universal negative propositions:

No true philosophers omit the enforcement of moral duty:

None who omit the enforcement of moral duty are true philosophers.

Nothing morally wrong is politically right:

Nothing politically right is morally wrong.

Real piety does not promote melancholy:

Whatever promotes melancholy is not real piety.

Again, the particular affirmative propositions, *Some proud men occasionally stoop to acts of the basest servility, Some poor persons are liberal*, may also be simply converted; for, the ellipsis of the sign being supplied, the sentences are, *Some proud men are some men who occasionally stoop, &c. Some poor persons are some liberal persons*. In the transposition therefore, both extremes retain their original quantity, and the truth of the proposition is also preserved: *Some who occasionally stoop to acts of the basest servility are proud men: Some liberal persons are poor*. So also, since it is false that *Some diamonds are Scotch-pebbles*, its converse, *Some Scotch-pebbles are diamonds*, is likewise false.

The truth of the simple converse of I is proved in the text by the following process. If a particular affirmative proposition is true, (as, *Some poor men are liberal*;) its contradictory is false; (namely, E, *No poor men are liberal*;) but the simple converse of this is also false; (namely, E, *No liberal men are poor*;) therefore the contradictory to this is true, (I, *Some liberal men are poor*;) which is the simple converse of the original proposition.

The following are examples of the conversion of particular affirmative propositions.

Some full-grown persons display all the folly and thoughtlessness which characterize youth:

Some who display all the folly and thoughtlessness which characterize youth are full-grown persons.

Some offences against the divine law are exempt from human cognizance:

Some practices exempt from human cognizance are offences against the divine law.

Some things imperceptible by the unassisted eye are productions of art:

Some productions of art are things imperceptible by the unassisted eye.

2. *Subordinate or accidental conversion* is not so perfect as the former, inasmuch as it requires a change from the universal to the particular.

Universal negative propositions are convertible not only *simply*, but also *accidentally*. For if the simple converse is true, the particular which is subalternate to that simple converse is also true; which, (by the definition,) is the accidental converse of the primary proposition. Thus, since it is true that, *No larks are web-footed birds*, it follows by simple conversion that, *No web-footed birds are larks*; whence it is necessarily true by the laws of opposition, that, *Some web-footed birds are not larks*; which is the converse *per accidens* of the original proposition.

Universal affirmative propositions may be converted *per accidens*. For when A is true, its subaltern is also true; which subaltern, being I, is simply convertible; and its simple converse will be the accidental converse of A. Thus it is true that, *Rich men are universally exposed to many snares*; it is therefore true that, *Some rich men are exposed to many snares*, of which the converse is also true, *Some who are exposed to many snares are rich men*. But this is the accidental converse of the original proposition.

The same may be said of the following examples:

Every act of fortitude is an act of virtue :
Some acts of virtue are acts of fortitude.

All the various ranks in society tend to the common good :

Some things which tend to the common good are the various ranks in society.

All tygers are carnivorous :
Some carnivorous animals are tygers.

A may be simply converted when its predicate is

distributed : as, 'Ἡ εὐδαιμονία ἐστὶ τὸ ἀρίστον' 'Ἡ ἀρετὴ ἐστὶν ἡ ἠθικὴ μεσότης' 'Ὁ μεγαλόψυχός ἐστὶν ὁ μεγάλων αὐτὸν ἀξίων, ἄξιός ὢν. *Et quod decet, honestum est, et quod honestum est, decet.* In these and similar sentences the subject and the predicate are co-extensive, and therefore reciprocal. Thus also if it is true that *Cicero was the discoverer of Cataline's conspiracy*, it is equally true that *the discoverer of Cataline's conspiracy was Cicero*.

But when this is not the case, an universal affirmative proposition cannot be simply converted ; as,

Admitting that the meeting was an illegal meeting, it does not necessarily result that it was a riotous one ; for although a riotous meeting is therefore an illegal one, yet it is not thence to be inferred, as a matter of course, that if illegal, it must be riotous.

Aliud est jus civile, aliud jus gentium. Quod civile, non idem continuo gentium ; quod autem gentium, idem civile esse debet.

It must be observed, that the *inference* in the case of accidental conversion is not so complete as in simple conversion ; for the accidental converse does not *necessarily* follow the leading proposition, except when the latter is true. If therefore any proposition be true, its converse, whether simple or accidental, must be true : but on the contrary, if a proposition be false, although its simple converse must be false, yet its accidental converse may be either true or false. For conversion *per accidens* depends on the laws of subaltern opposition ; in which the particular does not necessarily retain the accidental quality of the universal, except when the universal is true.

Hence it cannot be inferred from the falsehood of the propositions, *No Hottentots possess reason, All who are promoting the good of their fellow creatures are wealthy men*, that the accidental converse of

each is false ; namely, *Some who possess reason are not Hottentots ; Some wealthy men are promoting the good of their fellow creatures* : these propositions being in fact true.

O is not convertible either simply or per accidens. For since its subject is not distributed, the converse would require the predicate to be undistributed ; which is impossible in negative propositions.

There is another species of conversion which is of very frequent use. It is called *conversion by contraposition*, or, *by negation* ; and consists in the transposition of the extremes, and the combination of the *particula infinitans*, *not*, with both of them. It is applicable to universal affirmative and particular negative propositions. And the inference of the converse from the converted proposition is perfect ; since they are necessarily true or false together.

1. For instance, the *universal affirmative* sentence, *All vertebrated animals have red blood*, (that is, *All vertebrated-animals are redblooded-animals*,) converted by contraposition becomes, *All not-redblooded-animals are not-vertebrated-animals*, that is, *Whatever animals have not red blood are not vertebrated* : or, *None but redblooded animals are vertebrated*.

Thus also ;

Every duty is accompanied with a certain propriety and decorum : therefore, *Whatever is not accompanied with a certain propriety and decorum is not a duty*.

All benevolent persons exercise self-denial for the benefit of their fellow-creatures : therefore,

Whoever does not exercise self-denial for the benefit of his fellow-creatures is not benevolent : or, *They only who exercise self-denial, &c. are benevolent*.

All objects of congratulation are objects of envy ; therefore,

Ὁ δ' ἀφθόνητός γ' οὐκ ἐπιζήλος πέλει. (*Æsc. Ag. 912.*)

Whosoever is of God doeth righteousness and loveth his brother: therefore,

Whosoever doeth not righteousness is not of God, neither he that loveth not his brother.

The argument also in the 12th chapter to the Hebrews (ver. 7, 8.) proceeds on the same principle. It amounts to this; *All the children of God are partakers of chastisement: therefore, by contraposition, They who are not partakers of chastisement are not children of God.*

2. The particular negative proposition, *Some sentimental persons are not benevolent*, converted by contraposition becomes, *Some non-benevolent-persons are not non-sentimental persons*; which, divested of the harshness of its form, is, *Some who are not benevolent are sentimental.*

Again: *Some who are candidates for the office of directing others are not competent to regulate their own tempers.* By contraposition this becomes, *Some who are not competent to regulate their own tempers are not not-candidates for the office of directing others*: that is, less harshly expressed; *Some persons though incompetent to regulate their own tempers do not hesitate to offer themselves as candidates for the office of directing others.*

The process of converting a particular negative proposition by contraposition may be simplified by transferring the negative particle from the copula to the predicate. The sentence is thus reduced to a particular affirmative form; the simple converse of which will be the converse by contraposition of the original proposition. Thus the proposition, *Some jewels are-not diamonds*, is equivalent to, *Some jewels are not-diamonds*; of which the simple converse is, *Some not-diamonds are jewels*; that is, *Some things which are not diamonds are jewels.* In the same manner, because,

Some fishes have no teeth, therefore,

Some animals without teeth are fishes.

Some highly important duties cannot be accomplished without the exercise of selfdenial ; therefore,

Some things which cannot be accomplished without the exercise of selfdenial are highly important duties.

Some men of great abilities are not agreeable in manners or disposition :

Some persons who are not agreeable in manners or disposition are men of great abilities.

This method of conversion is of extensive use, both for logical and rhetorical purposes. It is logically useful, in the analysis of arguments for the purpose of reducing them to form ; and in the demonstration of the correctness of syllogisms. It is rhetorically useful, because the negative or contrapository converse frequently conveys a sentiment with more perspicuity and emphasis than the primary form. Thus, *All who deserve the fair are brave*, is weak in comparison with its equivalent sentence in the converted form, *None but the brave deserve the fair*. This observation applies most fully to the conversion of universal affirmative sentences, as is obvious from several of the examples above given.

CAP. III.

DE SYLLOGISMO CATEGORICO PURO.

§. 1. *Quid sit Syllogismus.*

TERTIA pars Logicæ agit de *Argumento* sive *Syllogismo*, quod est signum tertiæ operationis intellectûs: nempe *Discursus*, vel *Ratiocinium* Propositionibus expressum.

Quare, cum *Discursus* sit progressus mentis ab uno judicio ad aliud, perspicuum est in eo requiri, 1. Aliquid unde *discursus* ordiatur; 2. Aliud quo perveniat; 3. Ea sic ab invicem pendere, ut unum ex alio, et aliûs vi innotescat; secus enim, unum post aliud cognoscere, est tantum sæpe judicare.

Reasoning has been defined to be *the motion or progress of the mind from one judgment to another*. This definition is necessarily figurative; since it is naturally impossible to assign in explanation of it any notions which are in themselves more simple. It may perhaps be more properly called an *illustration* than a *definition*. As in natural motion, there must be a place from which the moving body sets out, a place at which it arrives, and a connexion between the two by the presence of the body successively in each intermediate point: so in the act of reasoning, there must be certain principles from which it commences; a conclusion at which it arrives; and such a relation between the principles

and the conclusion, that the mind possessed of the former shall be irresistibly carried on to the latter.

Thus when the mind is thoroughly convinced that, *Every science which elucidates history is of important use*; and that, *Chronology is a science which elucidates history*; it cannot refuse to acquiesce in the inference that, *Chronology is of important use*.

But when it is argued (as some have done) that *Because at the creation the sun was made to rule the day, and the moon and stars to rule the night; therefore the pope is superior to kings and emperors*; the mind cannot recognize any mutual relation: the sentence expresses no more than two or three unconnected judgments.

Jam, ex quo aliud cognoscendum est, ipsum certe præcognosci debet; et proinde quasi sine discursu notum, *antecedere, poni, præmitti*; et ex eo reliquum *concludi, colligi, inferri et sequi dicitur*.

The principles on which arguments are founded must be known *previously* to the position which is to be proved. Hence an astronomer, having previously discovered that *on such a day the earth will directly intervene between the sun and the moon*, infers that *a lunar eclipse will then occur*; while another person, having first been assured on competent authority of the fact of the eclipse, or being a witness of it, infers from that fact the relative position of the heavenly bodies.

The principles thus supposed to be previously known are therefore said to be *laid down* or *pre-mised*; and the new proposition at which the mind arrives by their means is, in familiar as well as technical language, said to *follow*, to be *deduced*, *collected*, or *inferred* from them.

These principles are themselves derived either from impressions conveyed to the mind through the bodily senses, or from consciousness, or from testimony, or from inductive process, or from previous syllogistic argument:

For instance: 1. *The too frequent use of the telescope injures the eyes; The sensation produced by contact with fire is painful; Winter is cold;* are conclusions the first principles of which were impressions conveyed through the medium of the senses.

2. *I am the same person that I was ten years ago;* is an inference from a principle which is derived from consciousness; namely, *I retain the impressions of events which affected me at that time.*

3. The principles, *Philip and Alexander were unable to govern themselves, Philip and Alexander were celebrated conquerors;* (from which flows the conclusion, *some celebrated conquerors have been unable to govern themselves;*) are derived from the testimony of historians.

4. In the argument, *No papilionaceous plants are poisonous; but trefoil is a papilionaceous plant; therefore trefoil is not poisonous:* both the principles from which the conclusion is drawn have been previously ascertained by induction; that is by an examination and comparison of so many individual instances as are deemed sufficient to authorize those universal laws or rules.

5. When it is argued, *Every measure which interferes with the stability of the British constitution is objectionable; The maintenance of a large standing army in time of peace is a measure which interferes with the stability of the British constitution; therefore the maintenance of a large standing army in time of peace is objectionable:* both the premised principles may be considered as already proved by syllogistic argument from other premises; namely, the first from the principle that *every such measure violates*

the bill of rights; the second from the principle that a standing army destroys the equilibrium of the three estates of the realm.

Those principles the knowledge of which is usually attributed to *intuition* are more correctly considered to be the result of spontaneous induction. Of this kind are the general truths called axioms.

The question whether induction and syllogism are sister-branches of argument or reasoning; or whether induction is a species of syllogism, does not require to be here decided. The appropriate office of induction is to discover truth; that of syllogism is to apply it. The latter is the subject of the following observations.

Est autem duplex *consequentia*:

1. *Materialis*; quando ex Antecedente Consequens infertur solâ vi Terminorum, quæ est *Argumenti materia*: ut, *Homo est animal*. • Ergo *est vivens*.

2. *Formalis*; quando infertur propter ipsum colligendi modum, quæ est *argumenti forma*; ut, *B est A; C est B: Ergo C est A*. Mutatis terminis et servatâ eorum dispositione, *Materialis* plerumque fallit, *Formalis* semper obtinet: et proinde hæc solum in *Logicâ* spectatur, illa, tanquam mutabilis et lubrica, negligitur.

The word *Consequence* (*consequentia*) is most frequently employed, both in familiar and in scientific writings, in the same signification as the word *consequent* (*consequens*); namely, to denote that which follows or is deduced from some antecedent cause or principle. But it is more consistent with the

analogy of language to apply it either to *the dependence of the consequent on its antecedent*; or to *the mode in which that dependence is shewn*. In the latter of these two senses it is here employed.

1. *Material consequence*, denotes the dependence of the proposition inferred from the principles premised, when that dependence is discoverable merely from the general sense of the passage, the argument not being expressed according to logical arrangement. In this manner arguments are most frequently advanced, unless any peculiarity in the subject, or in circumstances, requires a more definite and perspicuous statement.

The following are instances of material consequence.

A good education is highly valuable; for it softens the manners and ameliorates the dispositions of the heart.

The earth has been repeatedly circumnavigated; we need therefore no other evidence to authorize us to explode the ancient doctrine that we live on an interminable plane.

It is gross idolatry to pay religious adoration to a created being; now that the sun is a creature none can deny; consequently the worshippers of the sun are idolaters.

2. *Formal consequence* is that mode of stating an argument which strictly accords with logical principles, and represents the actual process of the mind in arriving at the conclusion.

The arguments above given, when reduced to form, will be thus expressed:

Every thing which softens the manners and ameliorates the dispositions of the heart is highly valuable: But, a good education softens the manners and ameliorates the dispositions of the heart: Therefore, a good education is highly valuable.

No interminable plane is circumnavigable: The

earth is circumnavigable : Therefore the earth is not an interminable plane.

Or thus : Nothing which has been circumnavigated is an interminable plane : The earth has been circumnavigated : Therefore the earth is not an interminable plane.

To worship a created being is idolatry : To worship the sun is to worship a created being : Therefore to worship the sun is idolatry.

Every *material* argument is reducible to a *formal* syllogism, by correcting the arrangement and by supplying that which is more usually left to the judgment of the hearer. The harshness and apparent tautology of the formal syllogism has, indeed, been an occasion of much prejudice against the syllogistic system. Such an objection is however as unreasonable as it would be to urge that grammar is futile, from the harshness which the writings of any author would present if all the grammatical ellipses were supplied. The man who should publish the Spectator with every grammatical ellipsis filled up, and he who should reduce Euclid's Elements to formal syllogisms, would alike display their own absurdity, but would not prove any futility, either in the science of grammar, or in the principles or practice of syllogistic argument.

It is not the province of Logic to ascertain the truth of the propositions in an argument, which must be the appropriate office of other sciences ; but, supposing the principles true, to ascertain the inferences deducible from them. It effects this chiefly by guarding the mind against the fallacies which may arise from the language in which an argument is expressed. To this object the following rules are directed : and in the illustrations attached to them, the premises must be hypothetically considered as true.

Hisce intellectis, opinor satis constare quo sensu definiatur *Syllogismus*; *Oratio, in quâ positis quibusdam atque concessis, necesse est aliud evenire præter et propter ea quæ posita sunt atque concessa.*

Syllogism is a species of sentence; and is distinguished from all the collateral species by the logical difference, which is described in the remainder of the definition. The antecedent contains principles which not only the person arguing lays down as true, but to which he supposes that those to whom the argument is addressed will yield assent. Those principles, if not assented to, require to be established by either syllogistic or other proof, according to their nature. The conclusion in a syllogism is so closely related to the principles premised as to be necessarily implied in them; yet it expresses a judgment totally distinct from them. To assert that *because no bad men are profitable companions, therefore no profitable companions are bad men*, is not to syllogize; for the conclusion is not distinct from the proposition whence it is deduced, but is entirely involved in it. The inference that *the company of bad men should be avoided, because it is pernicious*, is syllogistically drawn; for the conclusion, *the company of bad men should be avoided*, is both *præter* and *propter*, distinct from, and rendered necessary by, the previously known premises, *Whatever is pernicious should be avoided*; and, *The company of bad men is pernicious.*

§. 2. *Canones Syllogistici.*

MULTÆ sunt ejus species; sed una tantum præsentis instituti; nempe *Categoricus simplex*, i. e. qui constat tribus propositionibus de inesse.

E quibus duæ priores sunt Antecedens, tertia Consequens; quæ extra syllogismum spectata (scil. quamdiu hæret in incerto) *Problema*, et *Quæstio* dicitur; in syllogismo autem (nempe post fidem factam) *Conclusio*.

Question } *Is emulation a principle worthy of en-*
or } *couragement?*
Problem. }

Ante- } *Whatever promotes diligence is a principle*
cedent. } *worthy of encouragement;*
Conse- } *Emulation promotes diligence: Therefore,*
quent. } *Emulation is a principle worthy of en-*
 } *couragement.*

Ante- } *Whatever produces envy is not a principle*
cedent. } *worthy of encouragement;*
Conse- } *Emulation produces envy; Therefore,*
quent. } *Emulation is not a principle worthy of*
 } *encouragement.*

Quæstionis duo sunt extrema, Subjectum et Prædicatum; quorum de Convenientiâ vel Dissidio inquiritur, ope termini alicujus tertii; idque propter Canones sequentes, in quibus vis omnis Syllogistica fundatur.

Terms are said to *agree* with each other, when either of them can be affirmatively predicated of the other: they *disagree*, when the one cannot be predicated of the other. In estimating the agreement or disagreement, each term must be taken in conjunction with its appropriate sign; that is, in reference to its actual extent in the proposition. Thus, *All mountains are conductors of electric fluid*, denotes that the term *all-mountains* agrees with the term

some-conductors-of-the-electric-fluid, and that *some-conductors-of-the-electric-fluid* agrees with *all-mountains*. *Some minerals are inflammable substances*, expresses the mutual agreement between *some inflammable substances* and *some minerals*. *No metals can be decomposed*, signifies that *all metals* differ from *all decompoundable substances*, and *all decompoundable substances* from *all metals*. *Some specious theories have not been consistent with established facts*, intimates a mutual disagreement between *all systems consistent with established facts* and *a certain definite portion of specious theories*.

1. Quæ conveniunt in uno aliquo eodemque tertio, ea conveniunt inter se.

Terms which agree with some one and the same third term agree with each other.

Thus let *some birds* and *some swimming animals* be two distinct terms, and let each be compared with the third term *all swans*. Since the term, *some swimming animals* agrees with *all swans*; (that is, *all swans are swimming animals*;) and *some birds* agrees also with *all swans*, (that is, *all swans are birds*;) it follows that the two terms agree with each other. In other words, because

All swans swim, and

All swans are birds; therefore

Some birds swim.

Again, let the question or problem be, *Humility is worthy of constant cultivation*. The predicate (*worthy of constant cultivation*) agrees with a third term, (*An ornament of the Christian character*); but the subject (*humility*) agrees with the same third term; therefore the extremes agree with each other. Hence the following argument is correct:

Every ornament of the Christian character is worthy of constant cultivation;

Humility is an ornament of the Christian character :

Therefore, Humility is worthy of constant cultivation.

2. *Quorum unum convenit, alterum differt uni et eidem tertio, ea differunt inter se.*

If one term agrees with and another differs from any one and the same third term, they differ from each other.

Thus since, of the two terms *Liverpool*, and *city*, the latter agrees with the third term, *the chief town in an episcopal see*, but the former disagrees with the same third term; they also disagree with each other. That is, because

Every city is the chief town of an episcopal see ;

But, Liverpool is not the chief town of an episcopal see ;

Therefore, Liverpool is not a city.

Again, if it is desired to prove that *A suspicious habit is not a quality appropriate to a man of sense*. The subject (*suspicious habit*) agrees with a third thing, (*sc. that which springs from a conscious want of dignity*): but the predicate (*a quality appropriate to a man of sense*) differs from that third. Therefore the extremes disagree with each other, and the argument is thus expressed; *Nothing which springs from a conscious want of dignity is a quality appropriate to a man of sense: But a suspicious habit springs from a conscious want of dignity: Therefore, a suspicious habit is not a quality appropriate to a man of sense.*

These two canons may be considered as axioms. They are principles so comprehensive and incontrovertible that they challenge immediate assent as soon as understood, and are in practice naturally employed as the foundation on which the super-

structure of syllogistic reasoning is to be reared, and as the final appeal in argument. They bear some analogy to the mathematical axioms, *Things which are equal to the same are equal to one another*; and, *Things of which one is equal and the other not equal to the same, are not equal to one another*. Yet the objects of the two sciences are so different, that to insist too minutely on the supposed similitude between the mathematical and the logical axioms, would be calculated to mislead or at least to confuse the mind.

3. Quæ non conveniunt in uno aliquo eodemque tertio, ea non conveniunt inter se.

Sunto enim A et C, nec assignari possit ejusmodi tertium; Ergo nihil habent commune; Ergo non conveniunt inter se.

The third canon is merely an appendage to the first. It asserts that no terms can agree with each other, unless that principle can be applied to them; that is, unless some other term can be adduced with which each of the given terms agree.

Thus, no third term exists which will agree with the terms *men* and *plants*. Therefore it is impossible to prove that these terms agree with each other; that is, that *men* are *plants*. For although there are qualities which exist in both; or classes to which both may be referred; yet these are not such as afford any common term of comparison. *All men*, for instance, are *organized creatures*; and *all plants* are *organized creatures*; but each of these terms agrees with *some organized creatures* only; and that, not the same *some*, but two distinct portions or subdivisions of the general class: so that they are not the same term.

4. Quorum neutri inest quod non sit in alio, ea non differunt inter se.

The fourth canon is, in like manner, a confirmation of the second. It merely states that there is no method of proving the mutual disagreement of two terms, except by a comparison with some single term which agrees with the one and disagrees with the other. If no such term can be found, no disagreement exists.

Thus, no idea is comprised in the term *rational-animal* which is not comprised in the term *man*; and vice-versâ, there does not exist in the aggregate of the notions expressed by the term *man* any which is not also comprised in the word *rational-animal*. Therefore it is impossible to find a third term with which one of these terms may agree, and from which the other differs. Therefore these terms cannot differ from each other; that is, it cannot be said that *men are not rational animals*.

So also, there is no *tree* which is not comprehended in the class *vegetables*; nor is there any notion expressed by the word *vegetable* which does not form a part of the complex notion expressed by *tree*. Therefore these terms do not disagree: it cannot be denied that *All trees are vegetables*.

5. Quæ non probantur convenire in uno aliquo eodemque tertio, ea non probantur convenire inter se. Dubitari enim potest utrum detur ejusmodi tertium, et dubitatio ista non tollitur.

6. De quibus non probatur, convenire unum eidem alicui tertio cui alterum differt, ea non

probantur differre inter se. Dubitari enim potest, utrum detur ejusmodi tertium, h. e. utrum alterutri insit quod non est in reliquo; et dubitatio ista non tollitur.

The use of a third term in a syllogistic argument is absolutely necessary. The most positive assertion, the most accurate description, the most strenuous appeal to the understanding, the most elegant and forcible amplification will not supply the place of it. Verbiage is often, undoubtedly, put in the place of argument, and the judgment may be misled by the fallacy: but no genuine syllogistic argument exists unless there be a comparison of some two terms with a third, on one or other of the principles contained in the first and second canons.

§. 3. *Syllogismi Regulæ generales.*

EX sex hisce principiis, Syllogismi structura sic deducitur.

1. In omni Syllogismo sunt tres, et tres tantum, termini. Nam Syllogismus omnis probat aliquam conclusionem: Et in illâ sunt duo tantum extrema; Et illa neque convenire, neque differre probatur, sine uno, unoque tantum, tertio.

Jam, Prædicatum Quæstionis dici solet *majus extremum, major terminus*; Subjectum Quæstionis, *minor*; Terminus vero tertius, cui quæstionis extrema comparantur, Aristoteli *Argumentum*, vulgo *Medium*: Nam prædicatum quæ-

stionis plerumque amplius est medio; hoc minori.

1. That three terms are necessary, and no more than three are admissible, in a correct syllogism, is obvious from the axioms already laid down. For, the conclusion to be proved contains two terms: the process of proof requires the comparison of each with a single additional term; nor is there any room for the admission of any more. Thus in the following syllogism the terms of the question are *utile*, and *honestum*; and the term of comparison is *bonum*.

Quod bonum est, id certe utile;
Quod honestum, id bonum; Ergo,
Quidquid honestum id utile.

2. It is expedient that each of these terms should be distinguished by an appropriate name. The *predicate* therefore of the *question*, or *conclusion*, is denominated the *major term* or *extreme*; the *subject* of the *question* or *conclusion* is the *minor term* or *extreme*; and the term of comparison is called the *middle term* or *medium*. Thus in the syllogism above given,

The major extreme or term, namely, the predicate of the question, is *utile*:

The minor extreme or term, namely, the subject of the question, is *honestum*:

The medium, or third term, is *bonum*.

The distinguishing names, *Major*, *Minor*, and *Middle terms*, are derived from the comparative extent of each, in most syllogisms which have an universal affirmative conclusion. Thus, in the syllogism, *Whatever betrays^s meanness is hateful^M; but flattery^m betrays^s meanness: therefore flattery^m is hateful^M*: the major extreme, (M) *hateful*, is

more extensive in its application than the medium, (μ) *whatever betrays meanness*, which is only one class of things *hateful*: and this medium is more extensive than the minor term, (m) *flattery*, which is but one class of *things betraying meanness*.

In the following apparent syllogism there are four terms; *True wisdom cannot be too dearly purchased*: *Humility always accompanies true wisdom*: *Therefore humility cannot be too dearly purchased*. For the major term is, *a good which cannot be too dearly purchased*: and the minor term is *humility*: but instead of a single middle term, one of these extremes is compared with, *true wisdom*; and the other with, *some quality which accompanies true wisdom*; which are distinct terms.

This rule is obviously violated when an argument contains an equivocal word employed in different significations. But it also extends to every occasion in which, through the imperfection of language, the same word is applied in senses analogous to each other, but not precisely the same. It is impossible, indeed, to avoid giving to almost every word which is employed, various shades and modifications of signification, so that they shall denote sometimes a greater and sometimes a smaller number of simple notions. If however we allow that variety in the use of the same word in the course of the same argument, we are guilty of fallacious reasoning. When, for instance, it is affirmed that, *That which is greater than faith and hope is the highest Christian grace*, and that, *Charity (love) is greater than faith and hope*; and from these principles it is inferred that *charity (almsgiving) is the highest Christian grace*; the argument contains four terms. Again, if we reason thus; *That which consists in a tendency to promote the general happiness of man affords a good rule of social conduct*; but *Expediency consists in that tendency*; and therefore *Expediency affords a good rule of social conduct*; the

argument is perfectly correct if the terms are applied throughout in the same meaning. But there is danger of its being perverted by some, who will acquiesce in the truth of the premiss in the purest sense of the word *expediency*; but will practically apply the conclusion in the corrupt sense of the word, namely, as signifying *that which, whether right or wrong, appears best adapted to their private interests or inclinations.*

On the other hand an argument must not be condemned when the terms, although apparently exceeding the legitimate number, are obviously reducible to three only. In this case there is merely a deviation from form, to which every correct material argument may easily be reduced. For example, it is rightly argued; *Whatever is opposed to the divine will must be ultimately injurious; but every violation of social rights is an offence against the precepts of Scripture; so that no injustice can possibly be expedient.* For although the argument apparently contains six terms, it is, in fact, equivalent to the following: *Nothing which is opposed to the divine will is expedient; Every act of injustice is opposed to the divine will; therefore, No acts of injustice are expedient.*

2. In omni Syllogismo sunt tres, et tres tantum, propositiones. Duæ præmissæ, in quibus Medium cum extremis seorsim conferatur, (nempe *Major*, in quâ cum majori; *Minor*, in quâ cum minori;) una *Conclusio*, in quâ extrema invicem committantur.

N. B. 1. Quod Major dici solet simpliciter, *Propositio*; Minor, *Assumptio*. 2. Quod Medium non ingreditur conclusionem, alias idem

per idem probaretur; adeoque non essent tres termini.

The limitation to three terms necessarily implies that a syllogism does not admit of more or less than three propositions. Two of these are occupied by the comparison of each extreme with the middle term; and the third consists in the statement of the result of that comparison.

Major premiss } All *sin*^μ is *injurious*^M;
or proposition, }

Minor premiss } All *pride*^m is *sin*^μ.
or assumption, }

Conclusion, All *pride*^m is *injurious*^M.

Here the major term (M) is *injurious*:
the minor term (m) is *pride*:
the medium (μ) is *sin*.

The *major* premiss is that in which the middle term is compared with the *major* extreme; *All sin is injurious*:

The *minor* premiss is that in which the middle term is compared with the *minor* extreme; *All pride is sin*:

The *conclusion* is that in which the major and the minor extreme are brought together: *All pride is injurious*.

In the most perfect form of syllogisms, the major premiss is usually a general principle, which is calculated to approve itself to every man's judgment, and is therefore not likely to be called in question; on which account it is sometimes called, by way of eminence, the *Proposition*. The minor premiss is on the other hand *assumed*, with particular reference to the conclusion which is to be deduced; (whence it receives the name *Assumption*;) and it is more

liable to objection. Thus, in the preceding example, it is probable that none would deny that *all sin is injurious*, though some might object that *there are some kinds of pride which are not sinful*, and thus deny the *minor*, or, in other words, represent the *assumption* as unfounded.

It is more convenient, but by no means necessary to the accuracy of a syllogism, that the major premiss should be first in order. In material arguments it often occurs that the minor premiss is first; and still more frequently that the conclusion begins the sentence; or, to speak more accurately, that the question having been first stated, it becomes needless to repeat it in the form of a conclusion. Thus, *Habitual cheerfulness is the best promoter of health; for it checks those secret anxieties and those violent ferments which derange and wear out the constitution; and it cannot be denied that whatever possesses so excellent a quality must have that beneficial tendency.* Here the major extreme is, *the best promoter of health*; and the major premiss is the last proposition in the order of the sentence: the minor extreme is, *habitual cheerfulness*; and the proposition, *for it checks, &c.* is the minor premiss. The conclusion, which is not formally expressed, is the same as the *question*, by which the sentence is introduced, *Habitual cheerfulness is the best promoter of health.*

In the following apparent syllogism the middle term enters the conclusion.

Some of those who merit our esteem are learned: But those who have laboured much and successfully in study are learned: Therefore the learned are men who merit our esteem.

It has, indeed, been contended that illative conversion is really a species of syllogistic argument. But the inference deduced by the process of conversion, although it is the result of the given pro-

position, is not actually different from it. Thus, the sentences, *Nothing expedient is sinful*, *None but a kind-hearted person is adapted to the care of children*; are not distinct truths from those propositions of which they are, respectively, the simple and the negative converse; (namely, *Nothing sinful is expedient*, *All persons adapted to the care of children are kind-hearted*;) but are only the developement of the same truths in a different form.

3. Ancipiti medio nihil conficitur. Neque enim affertur in hoc casu unum aliquod idemque tertium vel in quo extrema convenient, vel cui unum conveniat, alterum differat.

A middle term which is used ambiguously will not authorize any conclusion. For example :

The end of a good soldier's life is the safety and peace of his country. But death is the end of a good soldier's life: Therefore his death is the safety and peace of his country. Here the middle term (*the end of a good soldier's life*) is compared in one sense (denoting *the aim, the object*) with the major extreme (*the safety and peace of his country*); and in a different sense (denoting *the close, the termination*) with the minor extreme, (*death.*) The medium, therefore, bears two significations: in consequence of which, the extremes are not compared with one and the same third term.

Mr. Pillet, in his description of English manners, affirms, that the disposition of the English to suicide is evident from the number of *sculls* daily found in the Thames. He uses a doubtful or ambiguous middle term, confusing the small boat called *scull*, with the human *scull*. He argues thus :

A people whose chief river abounds in sculls (craniis)

is a people addicted to suicide. The English are a people whose chief river abounds in skulls (cymbulis); Therefore the English are a people addicted to suicide.

A favourite argument of Voltaire was this; *The cause of evil is itself evil; The Christian religion is the cause of evil; it is therefore itself evil.* The fallacy lies in the ambiguity of the middle term. The proximate and real cause of evil is evil; but Christianity is only the accidental cause, or occasion of the divisions and bloodshed which have been perpetrated under the shelter of its name. The extremes therefore are not compared with one single term.

It is obvious that this rule is only a particular branch of the first.

4. Medium non distributum est anceps. Esto enim B terminus communis in b et β divisibilis; Ergo b et β sunt opposita: et tamen vere dicitur, Aliquod B est b, et Aliquod B est β . Quare aliquod B est Medium anceps.

If the middle term be not distributed, it is a common noun taken in each premiss *particularly*; that is, denoting *some portion only* of the things signified by it. Consequently it may be employed in each of the premisses to signify a *distinct part* of its whole extent; in which case the extremes are not compared with one and the same third term.

All metals are dug out of the earth;

Coal is dug out of the earth: therefore,

Coal is a metal.

Here the middle term is not distributed; the *things dug out of the earth* referred to in the major premiss form a class distinct from and opposed to that class of *things dug out of the earth* which is

signified in the minor premiss. It is therefore a doubtful term. This will be rendered still more obvious by filling up the ellipsis of the sign; thus,

All metals are some minerals.

Coal is some mineral.

The same fundamental error occurs in the following arguments:

Some animals are not quadrupeds; But all elephants are animals; consequently some elephants are not quadrupeds.

Some virtuous men are persons of unpolished habits; for all virtuous men are free from any disposition to flatter; and it is well known that many who are indisposed to flatter run into the opposite extreme and pride themselves in an unpleasing roughness of manners. That is,

Some who are indisposed to flatter retain unpolished habits; All virtuous men are indisposed to flatter: Therefore some virtuous men retain unpolished habits.

Some effectual check to the progress of seditious publications is absolutely essential to the safety of our country; The total abolition of the art of printing would prove an effectual check to their progress: Therefore the total abolition of the art of printing is absolutely necessary to the safety of our country.

5. Quare Medium in præmissis semel ad minimum distribui debet; sufficit tamen, si vel semel distribuatur. Nam 1. ad probandum A est C, conveniat C alicui B, et A omni; Ergo eidem alicui B: Ergo affertur unum aliquod idemque tertium &c. 2. ad probandum A non est C, conveniat C alicui B, et A differat omni; Ergo eidem alicui B: Ergo affertur &c.

It is indifferent to the correctness of an argument whether the middle term be distributed once or twice. For if one of the extremes agrees with *some part of the medium*, and the other extreme agrees with *every thing which is signified by the medium*; this extreme must also agree with the same part of the medium with which the former agrees: because the part is included in the whole.

Again, if one extreme agrees with *some part of the things denoted by the middle term*; and the other extreme *wholly* differs from the middle term *taken in its utmost extent*; then this extreme must also differ from the *part* of the middle term with which the former extreme agrees. So that in each case, the medium is virtually the same in both the premises.

<i>All injustice^D is evil;</i>	B is A.
<i>Persecution is injustice:</i>	C is B.
<i>Persecution is evil.</i>	C is A.

To prove that (A) *evil* agrees with, that is, is correctly predicated of (C) *persecution*; let (C) *persecution* agree with *some* (B) *injustice*; and let (A) *evil* agree with *all* (B) *injustice*. But *all injustice* comprehends every branch of *some injustice*; therefore (A) *evil* agrees with the same *some injustice* with which (C) *persecution* agrees, and they are duly compared with one and the same third term.

<i>Acquisitions^D of real value are not within the reach of the idle;</i>	}	B is not A.
<i>But science and literature are acquisitions of real value;</i>	}	C is B.
<i>Consequently they are not within the reach of the idle.</i>	}	C is not A.

The major extreme, *all benefits within the reach of the idle*, universally disagrees with *all acquisitions of*

real value, and consequently disagrees with those individual *acquisitions of real value* with which *science and literature* agree, and which constitute the real term of comparison or middle term.

6. *Processus ab extremo non distributo in præmissis, ad idem distributum in conclusione, vitiosus est. Nam ex aliquo non sequitur omne. Esto enim verum quod aliquod; Ergo potest esse verum quod aliquod non; (nam Subcontrariæ possunt esse simul veræ:) Ergo de aliquo potest affirmari quod non de omni. Esto rursus verum quod aliquod non; Ergo potest esse verum quod aliquod: Ergo de aliquo potest negari quod non de omni.*

An argument which professes to deduce an assertion concerning any term *universally* understood, from a premiss in which that term is only *partially* understood, must be unsound. For, by the principles of opposition of propositions, the truth of an universal cannot be inferred from the truth of the particular; and subcontrary propositions may be both true. Consequently the agreement or disagreement of the universal or *distributed* term cannot be inferred from the agreement or disagreement of the particular or *undistributed* term. If it is true, *Some wars are just*, it may also be true that *Some wars are not just*. Hence it cannot be inferred from either, that *All wars are just*; or that *No wars are just*. Therefore that may be affirmed or denied of *some*, which cannot be affirmed or denied of *all*.

No tale-bearer is worthy of confidence;

All tale-bearers are great talkers: therefore,

No great talkers^D are worthy of confidence.

Here the process of the minor extreme is illicit. The predicate of the minor premiss is *some great talkers*; therefore the only conclusion which it authorizes is, *Some great talkers are not worthy of confidence.*

*All traitors deserve capital punishment ;
Some murderers are not traitors : therefore,
Some murderers do not deserve capital punishment^D.*

The process of the major extreme is here illicit. In its premiss, it is the predicate of an affirmative, and therefore *is not* distributed; in the conclusion, being the predicate of a negative, it *is* distributed. No inference can be deduced from these premisses.

The study of nature is highly beneficial in expanding the mind ; but an acquaintance with ancient languages is a very different thing from the study of nature ; and consequently has not the same beneficial effect. Here the distribution of the major extreme is inaccurate: the premiss speaks of *some things highly beneficial in expanding the mind*; the conclusion makes an assertion in reference to *all things beneficial in expanding the mind.*

We know that our sight and our touch are bodily senses ; now experience teaches us how frequently both sight and touch are deceived ; we infer then that our bodily senses are universally liable to be misled. Here the distribution of the minor term is erroneous. The inversion of the order of the premisses (the minor premiss being first) is a deviation from the form, but does not render the argument incorrect. The premisses will admit of the particular conclusion, *Some of our senses may be deceived.*

This illicit process from an undistributed to a distributed extreme is a violation of the first rule; for the pretended syllogism contains four terms. It is therefore inconsistent with the fundamental principle of syllogistic argument; for the term compared with the middle term is not the identical

term of the question. Thus in the examples above given, *All great talkers, all who deserve capital punishment &c.* are the terms of the question ; but *some great talkers, some who deserve capital punishment* are the terms actually compared with the middle term, although they neither are the same as the former, nor even virtually imply them.

7. Præmissis negantibus nihil probatur: Affertur enim tertium cui utrumque extremum differt; non autem cui vel utrumque conveniat, vel unum conveniat, alterum differat.

The disagreement of any two terms with a third term does not afford any ground for inference as to their mutual agreement or difference. The absurdity of the following sentences, though they are placed in syllogistic form, is obvious.

No wicked men are happy; but some poor men are not wicked; therefore some poor men are happy: or, therefore some poor men are not happy.

No rich men are exempt from death; nor are they free from error; therefore those who are free from error are exempt from death: or, therefore none who are free from error are exempt from death.

Neither of the two primary axioms is here applied.

8. Si præmissarum altera sit negativa, erit etiam Conclusio. Nam præmissarum reliqua est affirmativa: Ergo extremorum unum differt medio, alterum convenit: Ergo extrema differunt inter se: Ergo conclusio est negativa.

A negative premiss must be followed by a negative conclusion. For it asserts the disagreement

between one of the extremes and the medium; while the other premiss, which must (by the preceding rule) be affirmative, asserts the agreement of the other extreme with the medium. Therefore (by the second canon) the extremes disagree, and the conclusion is negative. For example,

No mere man is infallible; now the pope is but a man; therefore the pope is not infallible.

9. Contra, si Conclusio sit negativa, erit etiam altera præmissarum. Nam extrema differunt inter se: Ergo eorum unum convenit medio, alterum differt: Ergo præmissarum altera affirmat, reliqua negat.

One negative and one affirmative premiss are necessary to prove a negative conclusion. For a negative conclusion asserts the disagreement of its extremes; which can be established only by means of a middle term which agrees with the one and differs from the other.

If it is to be proved that *Paganism is not a harmless invention of unenlightened mortals, intending, though ignorantly, to discover the true God*; it is necessary to adduce some medium with which *paganism* shall agree, and from which *a harmless invention, &c.* shall differ; or vice-versâ, with which the latter shall agree, and the former disagree. The term *whatever originates in a wilful departure from the truth* will serve for a middle term of the former kind; the term *that of which ignorance alone is the cause* will serve for a medium of the latter description. Hence the two following arguments are correct. They are given *materially*; it will be easy for the reader to reduce them to formal syllogisms.

It is sufficiently evident that paganism must have

originated in a wilful departure from the truth: indeed, its heinousness as involving the guilt of presumptuous opposition to the Divine will, is not to be disputed. It is, therefore, but a vain apology for heathenism to treat it as a harmless invention of poor unenlightened mortals, labouring, with good intentions but under invincible ignorance, to discover the true God, and to perform to him an acceptable service.

That system of error, indeed, of which ignorance alone was the cause, might be pleaded for as a harmless invention of poor unenlightened mortals; but ignorance could not be the cause of the introduction of false divinities by the immediate descendants of Cain and of Noah; therefore heathenism cannot be vindicated on any plea of harmlessness.

It has been observed (p. 92, 93.) that some propositions apparently negative are really affirmative; the adverb of negation being intended to qualify, not the copula, but one of the extremes. Hence arguments apparently inconsistent with the three fundamental rules concerning negatives in a syllogism may yet be correct. For instance;

He who loves not his neighbour is not a true Christian; but the slanderer loves not his neighbour; therefore the slanderer is not a true Christian.

Here the minor premiss is affirmative; since the particle *not* belongs to the predicate, as is evident by comparing the same term in the major premiss; for the medium of the syllogism is, *he who loveth not his neighbour*. The argument therefore may be thus expressed: *No men-who-love-not-their-neighbour are true Christians; but all slanderers are men-who-love-not-their-neighbour; therefore no slanderers are true Christians.* Or else instead of the major premiss may be used its converse, (by contraposition,) and then the minor premiss will be negative; *All true Christians love their neighbour; no slanderers love their neighbour; therefore no slanderers are true Christians.*

Again; *That which is not reducible to parts is eternal; the human soul is not reducible to parts; therefore it is eternal.* This syllogism (in which an affirmative conclusion is apparently deduced from a negative premiss) consists of three affirmative propositions; the middle term being, *that which is not reducible to parts.* It might be harshly yet correctly expressed, *Every thing non-reducible to parts is eternal; the human soul is non-reducible to parts; therefore the human soul is eternal.* Or the word *indissoluble* may be substituted as the middle term.

10. Præmissis particularibus nihil probatur. Nam præmissarum altera affirmat: Ergo in illâ medium non distribuitur: Ergo distribui debet in reliquâ: Ergo illa est negativa in quâ medium prædicatur; Ergo conclusio negativa: Ergo prædicatum ejus distribuitur, quod in præmissis non est distributum; Fuit enim vel affirmativæ terminus alter, vel subjectum negativæ; horum vero nullus distribuitur.

1. If both the premises in a syllogism be *particular affirmative* propositions, they cannot contain any distributed term. In this case therefore the middle term is not distributed, and (by rule 4,) no conclusion can be deduced. Thus no inference can be drawn from such premises as, *Some men are virtuous, but some are learned. Some of the planets are attended with satellites; but several of the heavenly bodies which the naked eye can discern are planets.*

2. If one of the premises be *negative*, it will contain the only distributed term in the antecedent of the syllogism, which must therefore be the middle term. It follows, that neither of the extremes is

distributed in the premises, and consequently (by rule 6.) neither may be distributed in the conclusion. But the conclusion must (by rule 8.) be negative; and in negative propositions one term at least must be distributed. In this case therefore there will be an illicit process of one extreme.

This may be illustrated by the following schemes.

I. <i>Med.</i>	<i>Maj.</i>		O. <i>Maj.</i>	<i>Med.</i> ^D
O. <i>Min.</i>	<i>Med.</i> ^D		I. <i>Min.</i>	<i>Med.</i>
O. <i>Min.</i>	<i>Maj.</i> ^D		O. <i>Min.</i>	<i>Maj.</i> ^D

In both these cases the process from an undistributed major extreme in the premiss to the same distributed in the conclusion is manifest. Accordingly the following arguments are totally incorrect:

Some of the older strata of the earth are not characterized by animal remains; Several of the superior strata are strongly characterised by them; therefore some of these are not to be classed among the older strata.

Some strictly virtuous men possess qualities which render them unpleasant companions; Some wealthy persons are not strictly virtuous; consequently some wealthy persons do not possess those qualities which render them unpleasant companions.

11. Si præmissarum altera particularis sit, conclusio quoque particularis est. Sit enim I. Præmissarum altera particularis affirmativa: Ergo in illâ nec extremum suum nec medium distribuitur: Ergo medium distribuitur in reliquâ, quæ etiam Universalis est, sitque I. Affirmativa: Ergo in illâ medium subjicitur, et extremum medio attributum non distribuitur: Ergo neutrum extremorum distribuitur in præ-

missis: Ergo neutrum in conclusione: Ergo conclusio particularis affirmativa est. Sit 2. Negativa: Ergo conclusio negativa; sed debet habere extremum non distributum: Ergo particularis negativa est.

Sit 2. Præmissarum altera particularis negativa: Ergo reliqua Universalis affirmativa: Ergo in præmissis duo tantum termini distribuuntur: Ergo conclusio habet extremum non distributum: Ergo cum negativa sit, erit etiam particularis.

If one of the premises be *particular*, the other must be *universal*.

The particular premiss must be either *affirmative* or *negative*. If it be *affirmative*, the universal premiss may be either affirmative or negative. If it be *negative*, the universal premiss must be affirmative. Hence arise three forms in which the premises may occur; namely, A. I. or I. A.; E. I.; and A. O. or O. A.

1. If the premises are both affirmative; the particular does not distribute either of its extremes, and the universal distributes only its subject; this distributed subject must therefore be the middle term. Consequently neither of the extremes of the question are distributed in the premises; therefore they must not be distributed in the conclusion; a limitation which is incompatible with any other species of proposition than the *particular affirmative*. Of this kind therefore the conclusion must be. Thus,

A. <i>Med.^D</i>	<i>Maj.</i>		I. <i>Med.</i>	<i>Maj.</i>
I. <i>Min.</i>	<i>Med.</i>		A. <i>Med.^D</i>	<i>Min.</i>
I. <i>Min.</i>	<i>Maj.</i>		I. <i>Min.</i>	<i>Maj.</i>

All minerals are fossils ; but some of the most useful substances in existence are minerals : therefore some of the most useful substances in existence are fossils.

Some recreations are necessary to the preservation of our health and spirits ; all recreations however are liable to be carried to excess ; so that some things liable to be carried to excess are necessary for the preservation of our health and spirits.

2. If the antecedent consists of a *particular affirmative* and an *universal negative* premiss, the former distributes neither term ; the latter distributes both : of which, one is necessarily the middle term, and the other is one of the extremes of the question. Therefore only one extreme can be distributed in the conclusion. But the negative premiss requires a *negative* conclusion ; and a negative proposition distributing only one extreme must be *particular*.

E. <i>Med.</i> ^D	<i>Maj.</i> ^D		E. <i>Maj.</i> ^D	<i>Med.</i> ^D
I. <i>Min.</i>	<i>Med.</i>		I. <i>Min.</i>	<i>Med.</i>
O. <i>Min.</i>	<i>Maj.</i> ^D		O. <i>Min.</i>	<i>Maj.</i> ^D

Upright and honest men ought never to be treated with contempt : Some men of very mean attainments and weak judgment are upright and honest ; therefore some men of mean attainments and weak judgment ought not to be treated with contempt.

3. If the premises are O and A, they contain two distributed terms ; of which one being the middle term, it remains that one only can be an extreme of the question ; consequently only one distributed extreme is admissible into the conclusion. But the conclusion must be *negative* (on account of the negative premiss,) and therefore, with that limited distribution, it can be no other than *particular*.

A. <i>Maj.</i> ^D	<i>Med.</i>		O. <i>Med.</i>	<i>Maj.</i> ^D
O. <i>Min.</i>	<i>Med.</i> ^D		A. <i>Med.</i> ^D	<i>Min.</i>
O. <i>Min.</i>	<i>Maj.</i> ^D		O. <i>Min.</i>	<i>Maj.</i> ^D

All real virtue is consistent with truth; but there are some kinds of candour which are not consistent with truth; therefore some candour is not real virtue.

This rule is only a branch of the sixth; for an universal conclusion cannot be inferred from a particular premiss without an illicit process of one of the extremes. As, *Some good men have been drowned; but no pirates are good men; therefore no pirates have been drowned.*

12. Quod si Conclusio particularis sit, non necesse est præmissarum alteram particularem esse. Fieri enim potest, ut instituto meo sufficiat subalternata, quando subalternans potuit inferri. Et cum illæ sint simul veræ, liberum est, utramvis inferre. Quanquam stricte loquendo, argumentatio non est accurata; nam subalternatæ veritas non immediate deducitur ex præmissis, sed ex subalternante.

This has not so much the nature of a rule, as of a caution. The eighth rule indeed, namely, that a negative premiss requires a negative conclusion, is reciprocal; for a negative conclusion also requires a negative premiss. But though, according to the eleventh rule, a particular premiss requires a particular conclusion, it is not true, reciprocally, that a particular conclusion requires a particular premiss. For instance,

Whatever wholly engrosses the soul renders men incapable of judging correctly concerning any future pleasure or pain: But all present experience of pleasure or pain wholly engrosses the soul: Therefore some present experience of pleasure or pain renders men incapable of judging correctly concerning those which are future.

This syllogism is not incorrect as to form; yet the more immediate conclusion from the premises would be, *Therefore EVERY present experience of pleasure or pain renders men incapable, &c.*; whence the subalternate, *some present experience, &c.* is to be inferred by the laws of opposition.

But if only the particular conclusion be required, it is more judicious to lay down in the premises no more than is necessary to authorize that conclusion. To do otherwise is to afford to an opponent a needless opportunity to cavil. In the above instance it might be objected to the minor premiss, that it is not true that *all present experience of pleasure wholly engrosses the mind*; and the objection, though in reality it does not affect the argument, might appear so to do to superficial readers or hearers, and would, at the least, divert the attention from the pith and force of the argument. This inconvenience would be avoided by adopting the *particular* for the *universal* premiss; thus, *It generally occurs, (or, it often occurs, or it sometimes occurs,) that present experience of pleasure wholly engrosses the soul; and therefore such present experience generally (or often, or sometimes) renders us incapable of judging correctly concerning future pleasure or pain.*

Two universal propositions may however bear such a relation to each other as will authorize no more than a particular inference: as,

All the stars are more distant from us than we are from the sun; But all the stars shed some degree of light on the earth; Therefore some things which shed a degree of light on the earth are more distant from us than we are from the sun.

An universal conclusion (*all things which shed light, &c.*) would offend against the sixth rule, by distributing the minor extreme when not distributed in its premiss. Yet the true conclusion (*some things which shed light, &c.*) might be drawn, if either of the premises were expressed particu-

larly. As the argument stands, the minor premiss is exposed to the objection that there are probably many stars the light of which has not yet reached the earth; which objection could not apply to it if thus expressed;

All the stars are more distant from us than we are from the sun; but some (or many) stars shed light on the earth; therefore some (or many) things which shed light on the earth are more distant from us than we are from the sun.

Syllogismi generales regulas complectitur hoc tetrastichon.

Distribuas medium; nec quartus terminus adsit:

Utraque nec præmissa negans, nec particularis:

Sectetur partem conclusio deteriore:

Et non distribuatur, nisi cum præmissa, negative.

The first of these lines expresses the substance of the first five rules above given; the second line refers to the seventh and tenth rules; the third to the eighth and eleventh rules; and the last line to the sixth and the ninth. The expression of the third line is derived from a fancied superiority of universal propositions over particulars; and of affirmatives over negatives.

All these rules of structure are nothing more than the application of the two primary canons to particular cases. For they simply amount to this, that when those circumstances occur which are prohibited by the rules, there is no comparison of two objects with a third term, with which both agree, or with which one agrees and the other disagrees,

Consequently, the arguments in support of these rules consist solely in an appeal to those canons.

The best means of familiarizing the mind with these rules is to apply them in the examination of syllogisms. And for this purpose it may be most convenient to adopt the following method. Obtain a definite apprehension of the question, or proposition to be proved; and of its component parts or extremes. Then trace the middle term, or hinge on which the argument turns. Reject needless words, reduce synonymous expressions to the same form, and supply whatever is elliptically left to the judgment of the reader or hearer. Having thus reduced the *material* argument into a *formal* syllogism; first, observe whether the terms are correct both as to number and sense; (rules 1. and 3.) and whether the propositions are correct as to number. (rule 2.) Then, compare the syllogism with the rules concerning particular and negative propositions; (rules 7—12.) and lastly, examine the distribution of the middle term, (rules 4, 5.) and of the extremes, (rule 6.)

For example, let the following *material* argument be given:

Confidence in promises is essential to the intercourse of human life. But there could be no confidence in promises, if men were not obliged to perform them. The obligation therefore to perform promises is essential, to the same ends, and in the same degree. (Paley.)

Here the question or problem is, *The obligation to perform promises is essential to the intercourse of human life.* The term of comparison is, (not, *confidence in promises*, but) *a quality necessary to create confidence in promises*; for the middle clause of the above sentence is equivalent to, *The obligation to perform promises is necessary to create confidence in promises.* Therefore the major premiss is, *Whatever is necessary to create confidence in promises*

is essential to the intercourse of human life; which is implied in the first clause. The formal syllogism is as follows:

Whatever is necessary to create confidence in promises is essential to the intercourse of human life; but the obligation to perform promises is necessary to create confidence in promises; therefore, the obligation to perform promises is essential to the intercourse of human life.

In which, (1st,) the terms are correct in sense and number; (2dly,) the propositions are correct in number and arrangement; (3dly,) the rules of negative and particular propositions are not violated; (4thly,) the middle term is once distributed; and (lastly,) the minor extreme, which is distributed in the conclusion, is also distributed in its premiss.

Again; let this argument be examined:

The care of the poor ought to be the principal object of all laws; for this plain reason, that the rich are able to take care of themselves. (Paley.)

Here the question or problem may be stated thus; *The poor ought to be the principal object of care in all laws.* The reason given is, *The rich are able to take care of themselves.* But this is not, in fact, the true reason, but another proposition which is implied in it, namely, *The rich alone are able to take care of themselves; that is, the not-rich, or the poor, are unable to take care of themselves.* The argument further proceeds on the supposition that every reader will spontaneously feel that *They who are unable to take care of themselves ought to be the principal object of care in all laws.* The syllogism therefore is:

They who are unable to take care of themselves ought to be the principal object of care in all laws: but the poor are unable to take care of themselves: therefore the poor ought to be the principal objects of care in all laws.

Which syllogism will be found consistent with each of the above general rules.

Several syllogisms both correct and incorrect are given, for the sake of practice, at the close of the Appendix.

§. 4. *De Modis Syllogismorum.*

SUPEREST per hasce regulas inquirere, quot modis componi possunt tres propositiones de inesse, ut syllogismum conficiant. Quâ in inquisitione duo spectanda sunt ;

1. *Modus*, sive legitima determinatio propositionum secundum quantitatem et qualitatem.
2. *Figura*, sive legitima dispositio medii cum partibus quæstionis.

That which renders the mind acquainted with its own powers is highly beneficial. Metaphysical studies render the mind acquainted with its own powers ; therefore metaphysical studies are highly beneficial.

1. To describe this syllogism as having the middle term employed as the subject to the major extreme, and predicated of the minor extreme, is to describe it by the *figure* to which it belongs. For such a description points out the arrangement of the middle term with the two extremes or parts of the question or conclusion ; which constitutes the *figure* of a syllogism.

2. To describe the same syllogism as consisting of three universal affirmative propositions, is to state its *mode* ; that is, the proper designation of the propositions according to their quantity and essential quality.

Modi sunt in universum 64. Nam, ut supra ostensum est, ad syllogismum faciunt propo-

sitiones tantum quatuor, A. E. I. O. Quare concipi potest quadruplex tantum major in syllogismo; cuilibet vero majori quadruplex tantum minor adjungi; unde 16 paria præmissarum; et singulis præmissis quadruplex tantum conclusio; unde 64 Modi syllogismorum.

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.

This table represents all the possible modes in which any three out of the four kinds of propositions can be placed together. The majority of them however must be inadmissible unless common sense were banished from the art of reasoning; for the rules of structure are nothing more than an arrangement of the dictates of common sense. The slightest comparison of the modes above enumerated with those rules will shew which of the combinations will produce correct syllogisms, and thus anticipate the following enumeration.

Ex his excluduntur sedecim per regulam 7. propter præmissas negantes, viz. EEA. EEE. EEI. EEO. *EOA. EOE. EOI. EOO. *OEA. OEE. OEI. OEO. *OOA. OOE. OOI. OOO. Duodecim per reg. 10. propter præmissas particulares, viz. IIA. IIE. III. IIO. *IOA. IOE. IOI. IOO. *OIA. OIE. OII. OIO. Duodecim per reg. 8. quia præmissarum altera negat, sed non conclusio, viz. AEA. AEI. AOA. AOI. *EAA. EAI. EIA. EII. *IEA. IEI. *OAA. OAI. Octo per reg. 11. quia præmissarum altera particularis est, sed non conclusio, viz. AIA. AIE. AOE. *EIE. *IAA. IAE. IEE. *OAE. Denique quatuor per reg. 9. quia conclusio negativa est sed neutra præmissarum, viz. AAE. AAO. AIO. *IAO.

Excluduntur igitur in univsum modi 52 = 16 + 12 + 12 + 8 + 4; e quibus multi contra plures regulas peccant, quamvis una tantum notetur.

Supersunt (64 — 52 =) 12 modi ad syllogismum utiles, viz. AAA. AAI. AEE. AEO. AII. AOO. *EAE. EAO. EIO. *IAI. IEO. *OAO.

This catalogue of excluded modes extends to those only which are erroneous as to the quantity or the quality of the propositions. But besides these, the mode IEO is essentially and necessarily incorrect. For the conclusion O requires the distribution of the major extreme; which extreme

(whether it be subject or predicate) the major premiss, I, will not allow to be distributed. It should therefore have been stated that there are *eleven* (not twelve) modes in which correct syllogisms may be formed.

§. 5. *Figuræ Syllogismorum.*

FIGURÆ Syllogismorum sunt quatuor. Nam Medium, quod cum utroque extremo comparatur, vel 1. subjicitur majori et tribuitur minori, et fit *figura prima*; vel 2. tribuitur utrique, et fit *secunda*; vel 3. subjicitur utrique, et fit *tertia*; vel 4. tribuitur majori et subjicitur minori, et fit *quarta*. Quæ omnia sequenti schemate declarantur.

Dispositio trium terminorum, scilicet majoris,

A, medii B, minoris C, in Figurâ.

1.	2.	3.	4.
B. A.	A. B.	B. A.	A. B.
C. B.	C. B.	B. C.	B. C.
C. A.	C. A.	C. A.	C. A.

Fig. 1.	Fig. 2.	Fig. 3.	Fig. 4.
MED. Maj.	Maj. MED.	MED. Maj.	Maj. MED.
Min. MED.	Min. MED.	MED. Min.	MED. Min.
Min. Maj.	Min. Maj.	Min. Maj.	Min. Maj.

The figures are not arbitrarily arranged, but according to the frequency of their use. The first figure is of the greatest practical utility, the fourth is of the least, or rather, of none. Of the other

two, the second is of more frequent occurrence and admits more extensive conclusions than the third.

Quare quælibet figura excludit adhuc sex modos : nempe;

1. Propter medium non distributum : Prima duos IAI. OAO. Secunda quatuor AAA. AAI. AII. IAI. Quarta duos AII. AOO.

2. Propter processum majoris illicitum : Prima quatuor AEE. AEO. AOO. IEO. Secunda duos IEO. OAO. Tertia quatuor AEE. AEO. AOO. IEO. Quarta duos IEO. OAO.

3. Propter processum minoris illicitum : Tertia duos AAA. EAE. Quarta duos AAA. EAE.

It is obvious that the distribution of the terms must be affected by their arrangement ; so that a mode which is correct under one figure will not be so under another. For example, let the mode AAA be successively applied to each of the figures.

1. *They who participate in the security of life and property conferred by a well-arranged system of government are bound by the strongest obligations to contribute to the maintenance of that government ; But all Englishmen participate in that security ; Therefore all Englishmen are bound to contribute to the maintenance of government.*

2. *All the moral virtues are habits ; But skill in the operations of any mechanical art is a habit ; Consequently skill in the operations of any mechanical art is a moral virtue.*

3. *All ostriches have short wings unsuited for*

flight ; But all ostriches are land-birds ; Therefore all land-birds have short wings unsuited for flight.

4. *Coal is a stratum of the earth containing much vegetable matter ; But whatever strata contain vegetable matter are of a later formation than granite ; Therefore whatever is of a later formation than granite is coal.*

The syllogism in the *first* figure is *correct*. That in the *second* figure is *incorrect*, for the middle term is not distributed. The syllogisms in the *third* and *fourth* figures are *incorrect*, on account of the illicit process of the minor extreme. And a comparison of these errors with the particular disposition of the terms will evince that they belong, not merely to the syllogisms adduced, but to any syllogisms in those figures consisting of three universal affirmative propositions ; that is, in the mode AAA.

In like manner each of the modes, except EIO and EAO, will be found inaccurate in one or more figures.

Supersunt Modi certo et necessario concludentes 24 ; sex in quâlibet Figurâ.

In Figurâ I.

<i>bAr</i>	Omne	B	est	A
<i>bA</i>	Omne	C	est	B : <i>Ergo</i>
<i>rA</i>	Omne	C	est	A.
<i>cE</i>	Nullum	B	est	A
<i>lA</i>	Omne	C	est	B : <i>Ergo</i>
<i>rEnt</i>	Nullum	C	est	A.
<i>dA</i>	Omne	B	est	A
<i>rI</i>	Aliquod	C	est	B : <i>Ergo</i>
<i>I</i>	Aliquod	C	est	A.

<i>f</i> E	Nullum	B	est	A.
<i>r</i> I	Aliquod	C	est	B: <i>Ergo</i>
O	Aliquod	C	non est	A.
A	Omne	B	est	A.
A	Omne	C	est	B: <i>Ergo</i>
I	Aliquod	C	est	A.
E	Nullum	B	est	A.
A	Omne	C	est	B: <i>Ergo</i>
O	Aliquod	C	non est	A.

1. BARBARA.

Those who derive benefit from every exertion of their industry are more likely to be industrious than labourers employed by the day; Journeymen who work by the piece derive benefit from every exertion of their industry: Therefore journeymen who work by the piece are more likely to be industrious than labourers employed by the day.

2. CELARENT.

No real hardship upon individuals should be authorized by legislative enactment; The impress of sailors is a real hardship upon individuals; Therefore the impress of sailors should not be authorized by legislative enactment.

3. DARII.

Every thing which obstructs the free course of justice deserves the reprobation of the virtuous; There are modes of enforcing the strict letter of the law, which obstruct the free course of justice; Therefore there are modes of enforcing the strict letter of the law, which deserve the reprobation of the virtuous.

4. FERIO.

Those who endure dangers and face death merely for the sake of acquiring glory to themselves, without being influenced by any desire to benefit their country, are not possessed of true fortitude; But it cannot be denied that several of the heroes of antiquity endured dangers and faced death merely for the sake of acquiring glory to themselves, without being influenced by any desire to benefit their country; Consequently, several of the heroes of antiquity were not possessed of true fortitude.

5. AAI.

Every thing which belongs to man is imperfect; All the arts of civilization are of human invention; Therefore some of [*or*, all] the arts of civilization are imperfect.

6. EAO.

No change of place can satisfy the discontented; All expeditions to foreign countries consist in change of place; Therefore some expeditions to foreign countries do not satisfy the discontented; [*or*, no expeditions, &c.]

In Figura II.

<i>cEs</i>	Nullum	A	est	B
A	Omne	C	est	B: <i>Ergo</i>
<i>rE</i>	Nullum	C	est	A.
<i>cAm</i>	Omne	A	est	B
Es	Nullum	C	est	B: <i>Ergo</i>
<i>trEs</i>	Nullum	C	est	A.

fEs Nullum A est B
tI Aliquod C est B: *Ergo*
nO Aliquod C non est A.

bAr Omne A est B
Ok Aliquod C non est B: *Ergo*
O Aliquod C non est A.

E Nullum A est B
 A Omne C est B: *Ergo*
 O Aliquod C non est A.

A Omne A est B.
 E Nullum C est B: *Ergo*
 O Aliquod C non est A.

1. CESARE.

No conscientious person wilfully violates a solemn engagement; Every careless clergyman wilfully violates a solemn engagement: Therefore no careless clergyman is a conscientious person.

2. CAMESTRES.

All those who are qualified for sea-service must possess some knowledge of the arts of navigation; Mere inland watermen do not possess any knowledge of the arts of navigation: Therefore mere inland watermen are not qualified for sea-service.

3. FESTINO.

No man of sound sense can despise the study of the classics; Some modern pretenders to literature

do, however, despise the study of the classics :
Therefore some modern pretenders to literature are
not men of sound sense.

4. BAROKO.

All the fixed stars emit light from themselves ;
Yet there are some of the heavenly bodies which
do not emit light from themselves : Therefore some
of the heavenly bodies are not fixed stars.

In Figurá III.

<i>dAr</i>	Omne	B	est	A
<i>Ap</i>	Omne	B	est	C: <i>Ergo</i>
<i>tI</i>	Aliquod	C	est	A.
<i>fEl</i>	Nullum	B	est	A
<i>Ap</i>	Omne	B	est	C: <i>Ergo</i>
<i>tOn</i>	Aliquod	C	non est	A.
<i>dIs</i>	Aliquod	B	est	A
<i>Am</i>	Omne	B	est	C: <i>Ergo</i>
<i>Is</i>	Aliquod	C	est	A.
<i>bOk</i>	Aliquod	B	non est	A
<i>Ar</i>	Omne	B	est	C: <i>Ergo</i>
<i>dO</i>	Aliquod	C	non est	A.
<i>dAt</i>	Omne	B	est	A
<i>Is</i>	Aliquod	B	est	C: <i>Ergo</i>
<i>I</i>	Aliquod	C	est	A.
<i>fEr</i>	Nullum	B	est	A
<i>Is</i>	Aliquod	B	est	C: <i>Ergo</i>
<i>On</i>	Aliquod	C	non est	A.

1. DARAPTI.

To be ashamed of one's birth, profession, or rank in life, has been represented as the result of modesty; whereas in reality it is a symptom of pride. So that even that which is a symptom of pride has been represented as the result of modesty.

2. DISAMIS.

Some practices which the divine law allows are under particular circumstances inexpedient; All practices which the divine law allows are in themselves consistent with holiness: Therefore some things in themselves consistent with holiness are under particular circumstances inexpedient.

3. DATISI.

Every kind of pride is wholly inconsistent with the spirit of true religion; Yet there are several kinds of pride which are highly commended by the world: Therefore there are feelings highly commended by the world which are wholly inconsistent with the spirit of true religion.

4. FELAPTON.

No conspiracies against the liberty of the country lay any just obligation on the conscience; All such conspiracies however have the nature of contracts: Therefore some contracts do not lay any just obligation on the conscience.

5. BOKARDO.

Some compositions of an imitative nature, calculated by sublimity of idea and beauty of diction to expand and delight the mind and to excite every noble passion, are not written in verse; All such compositions however are justly called poems: Therefore some works justly called poems are not written in verse.

6. FERISON.

No prejudices are compatible with a state of perfection ; But some prejudices are innocent : Therefore some innocent things are not compatible with a state of perfection.

In Figurâ IV.

<i>brAm</i>	Omne	A	est	B
<i>An</i>	Omne	B	est	C: <i>Ergo</i>
<i>tIp</i>	Aliquod	C	est	A.
<i>cAm</i>	Omne	A	est	B
<i>En</i>	Nullum	B	est	C: <i>Ergo</i>
<i>Es</i>	Nullum	C	est	A.
<i>dIm</i>	Aliquod	A	est	B
<i>Ar</i>	Omne	B	est	C: <i>Ergo</i>
<i>Is</i>	Aliquod	C	est	A.
<i>fEs</i>	Nullum	A	est	B
<i>Ap</i>	Omne	B	est	C: <i>Ergo</i>
<i>O</i>	Aliquod	C	non est	A.
<i>frEs</i>	Nullum	A	est	B
<i>Is</i>	Aliquod	B	est	C: <i>Ergo</i>
<i>On</i>	Aliquod	C	non est	A.
<i>A</i>	Omne	A	est	B
<i>E</i>	Nullum	B	est	C: <i>Ergo</i>
<i>O</i>	Aliquod	C	non est	A.

1. BRAMANTIP.

All diamonds consist of carbon; but all carbon is combustible: Therefore some combustible substances are diamonds.

2. CAMENES.

All the planets are opaque bodies; No opaque bodies are capable of transmitting light in any other way than by reflection: Therefore bodies capable of transmitting light in any other way than by reflection are not planets.

3. DIMARIS.

Some of the inhabitants of the sea have antennæ and horny jointed legs; but all animals of this description are insects: Therefore some insects are inhabitants of the sea.

4. FESAPO.

No vice is to be admitted as a species of relaxation suited to a Christian; Every species of relaxation suited to a Christian consists of a cessation from ordinary occupations: Therefore some cessation from ordinary occupations is not vice.

5. FRESISON.

No fallacious argument is a legitimate mode of persuasion; Some legitimate modes of persuasion fail of producing acquiescence: Therefore some arguments which fail of producing acquiescence are not fallacious arguments.

Barbara, Celarent, Darii, Ferioque, prioris:
Cesare, Camestres, Festino, Baroko, secundæ:
Tertia, Darapti, Disamis, Datisi, Felapton,
Bokardo, Ferison, habet: Quarta insuper addit

Bramantip, Camenes, Dimaris, Fesapo, Fresison:
Quinque Subalterni, totidem Generalibus orti,
 Nomen habent nullum, nec, si bene colligis,
 usum.

These lines serve as a *memoria technica*, to fix on the mind without much trouble the various forms of correct argument, and with them, the rules which follow on the subject of *reduction* of syllogisms. The examples of those modes in which a subalternate conclusion is given instead of an universal are sufficient to shew their inutility. See also the observations on the twelfth rule of structure, page 158, 159.

§. 6. *De Modorum Demonstratione.*

ATQUE omnes quidem 24 eatenus concludere, quod in iis convenientia vel dissidium extremorum certo atque necessario colligatur, ex Principio primo et secundo abunde constat.

For it has been before observed that every syllogism by which an affirmative conclusion is established is an application of the first Canon or general principle; (p. 135.) and that every syllogism in which a negative conclusion is inferred is an application of the second Canon. (p. 136.)

Quod optime demonstrat Aristoteles ad hunc modum.

Statuit primo Theorema, quod Scholastici vocant *Dictum de Omni et Nullo*; scil. “ Quod
 “ prædicatur Universaliter de alio, (i. e. de ter-

“mino distributo,) sive affirmative, sive negative; prædicatur similiter de omnibus sub eo contentis.”

Admisso hoc Theoremate (quod axioma sponte perspicuum est) constat una, modos quatuor priores in primâ certo atque necessario concludere. Nam eorum major ostendit majus extremum prædicari de medio distributo; et minor, minus extremum sub medio contineri.

The first figure consists in the application of some general principle to a subordinate case. It is, for instance, a general principle in which most persons will acquiesce, that, *No system which is impracticable in a large community is intended to be of universal obligation.* But, the system of *community of goods* is an especial case subordinate to the subject laid down, namely, *Systems impracticable in a large community.* The original principle will therefore be correctly applied to it; namely, *Community of goods is not a system intended to be of universal obligation.*

The fundamental axiom of the first figure is usually thus expressed: “Whatever may be either affirmatively or negatively predicated of any universal or distributed term, may be predicated in the same manner, (that is, affirmed or denied respectively,) concerning every thing comprehended under that term.”

Thus if *habits* are affirmed of *all virtues* universally; and if *prudence*, or *justice*, or *benevolence*, or *patience*, or *temperance*, is comprehended under the term *virtue*; then *habits* may also be affirmatively predicated of each of these. The syllogism therefore will be in this form;

All virtues are habits ;

Prudence, [or, justice, or benevolence, or patience, or temperance,] is a virtue :

Therefore prudence [or justice, or benevolence, or patience, or temperance] is a habit.

Again, in the following syllogism,

Quod bonum, id certe utile ;

Quod honestum, id bonum ; Ergo

Quidquid honestum, id utile :

The major extreme *utile* is, in the major premiss, predicated universally and affirmatively of *bonum* ; but the minor term *honestum* is declared in the minor premiss to be comprehended under *bonum* ; therefore *utile* is predicated in the same manner, that is, affirmatively, of *honestum* ; in other words, it is inferred that *quidquid honestum est, id utile*.

Quod contra naturam est, id non est utile :

Hominem hominis incommodo suum augere commodum est contra naturam :

Ergo, hominem hominis incommodo suum augere commodum non est utile.

The major extreme, *utile*, is, as stated in the major premiss, predicated universally, negatively, of *quod contra naturam est*, which is the middle term ; but the minor extreme, *hominem hominis incommodo suum augere commodum*, is stated in its premiss to be comprised under that middle term : therefore the major extreme is predicated negatively concerning the minor extreme.

It is obvious that the *major* premiss in this figure, inasmuch as it lays down a general principle, must be an *universal* proposition ; and that the *minor*, since its office is to assert the subordination of the minor term to the middle term, must be *affirmative*.

Quare, Modi quatuor prædicti nihilo peni-

tus indigent quo necessitas conclusionis appareat, præter ea quæ in præmissis posita sunt: et proinde quatuor illi sunt præ cæteris evidentes. Nam cæteri omnes aliquo vel aliquibus egent, quæ, utcunque per præmissas necessaria, in Syllogismo tamen non exprimuntur. Quare illos Aristoteles *perfectos*, hos *imperfectos* dicit; Scholastici *directos*, et *indirectos* vocant: quia per illos ad conclusionem, velut ad scopum, recta itur; per reliquos eodem perveniri potest, prius tamen alio deflectendum est.

The illative force of syllogisms in the first four modes of the first figure has been already shewn. But every correct argument in the other figures may be reduced to an equivalent syllogism in some one of these modes, by changing one or both of the premises into others of the same signification which shall involve the principle of the first figure. For instance, the following is a syllogism in the second figure:

*No birds are viviparous animals ;
Bats are viviparous animals ; therefore,
Bats are not birds.*

But by substituting for the major premiss its simple converse, (which is necessarily implied in it,) the same argument may be thus expressed in the first figure:

*No viviparous animals are birds ;
Bats are viviparous animals ; therefore
Bats are not birds.*

Again, it may be argued in the third figure, that,
No dishonest measures are really expedient ;

But some dishonest measures bear the appearance of expediency;

Therefore some measures which bear the appearance of expediency are not really expedient.

To which the following syllogism in the first figure is equivalent; being deduced from it only by the simple conversion of the minor premiss:

No dishonest measures are really expedient:

But some measures which bear the appearance of expediency are dishonest;

Therefore some measures which bear the appearance of expediency are not really expedient.

This process is denominated *Reduction*. It is usually applied to the purpose of demonstrating the correctness of the *consequence* (that is, the real dependence of the conclusion on the premises) in the modes of the three latter figures. And the evidence which is thus afforded is undoubtedly satisfactory.

It is not however the only or the primary evidence of the correctness of these modes. Much less can it be supposed that they are in themselves less accurate forms of argument than those in the first figure; or that their conclusions are authorized only because they imply certain corresponding forms in that figure: although this erroneous apprehension has given occasion to the names, *imperfect*, *indirect*, and *inevident*, by which they are usually distinguished. If indeed such a distinction were founded on truth, the first figure would always be the most natural form of an argument, which is not the case. The following argument, for instance, is in the second figure, in *Camestres*; a form of very frequent use; *The real culprit has a deep scar on his left cheek; but the prisoner at the bar has no such mark, and therefore is not the real culprit.* But it can scarcely be supposed to owe its correctness to the fact that its premises imply the following harsh syllogism in the first figure:

No man who has a deep scar on his left cheek is the prisoner at the bar ;

But the real culprit has a deep scar on his left cheek ;

Therefore the real culprit is not the prisoner at the bar ;

which conclusion implies its converse,

Therefore the prisoner at the bar is not the real culprit.

Common sense will at once suggest which is the more *direct* and *evident* mode of reasoning.

In fact, each figure consists in the application of a distinct and independent axiom or general principle.

The principle of the SECOND FIGURE is this:
 “ Whatever universally *comprehends* any quality
 “ disagrees with every thing which *excludes* that
 “ quality; and, whatever universally *excludes* a qua-
 “ lity, disagrees with every thing which *comprehends*
 “ the same quality.” Or it may be thus stated:
 “ If any quality is universally predicable concern-
 “ ing any thing or class of things, whatever *does*
 “ not possess that quality disagrees with that thing
 “ or class: and if a quality is universally denied
 “ concerning any thing or class, whatever *possesses*
 “ that quality must also be denied of the same.”

Thus, in the premises, *All real nettles are provided with stinging bristles ; but the plant called dead-nettle is not provided with stinging bristles ;* it is asserted that a certain quality (*viz. being provided with stinging bristles*) may be universally affirmed of *real nettles*, but is denied of *the plant called dead-nettle*. The inference is that these disagree with each other; that is, *The plant called dead-nettle is not the real nettle.*

Again, the premises, *Real nettles have no blossom, but the plant called dead-nettle has blossoms,* shew that because *real nettles* universally exclude the qua-

lity of *having blossoms*, which quality is possessed by *dead-nettles*, these classes disagree with each other. The conclusion therefore is that *the plant called dead-nettle is not the real nettle*.

Again, if the quality of *making good use of the knowledge acquired* is universally characteristic of *wise men*; and if there are *learned men* who do not possess the quality of *making good use of their acquired knowledge*; then those *learned men* destitute of that quality must be excluded from the whole class of the *wise*. Hence the argument, *All wise men make good use of the knowledge they have acquired; but some learned men do not so; therefore some learned men are not wise*.

This principle can only prove disagreement of the extremes: and therefore the second figure admits of none but *negative conclusions*; and requires a *negative premiss*. The *major premiss* must also denote the *entire* comprehension or exclusion of the quality adduced; that is, it must be *universal*.

The principle of the THIRD FIGURE is this: "If two qualities co-exist in the same subject, (being predicated of the same class, or portion of a class, or individual,) it is thereby proved that they *may agree* with each other. Or, if one is excluded from, and the other exists in, the same subject, it follows that they *may differ* from each other." The former case proves the qualities in question to be *compatible* with each other; the latter proves them to be *separable* from each other. Hence the *conclusions* founded on this axiom are necessarily *particular*. And when the conclusion is negative, the major premiss (and not the minor) must be negative; because the major term is denied of a portion of the minor term; so that the *minor premiss* must uniformly be *affirmative*.

If, for example, the two qualities, *responsibility* and *mortality*, are affirmed to co-exist in the sub-

ject, *man*, (as expressed by the premises, *All men are responsible; but all men are mortal;*) then it must follow that, *Some mortal beings are responsible.*

Again; if, of the two qualities, *virtue* and *responsibility*, the former is excluded from *some men*, and the latter belongs to the same *some men*, (which must be the case if it belongs to *all men*;) then the quality of *virtue* is separable from that of *responsibility*: that is, if *some men are not virtuous*, and yet *all men are responsible*, it follows that *some responsible beings are not virtuous.*

This figure frequently admits of a singular noun or an accumulation of singular nouns for the term of comparison: as, *Elijah was translated from earth without experiencing death; yet Elijah was a mere man; therefore a mere man may be translated from earth without experiencing death.* Again, *Meekness is compatible with fearlessness; for they were combined in the character of the great example of perfection.* Again; *Even infidels have acknowledged the purity of the moral precepts of Scripture; for Voltaire, Rousseau, and Hume have made such acknowledgment, and they are well known to have been infidels.*

The principles of the FOURTH FIGURE are these:
 “ If a class of things, or a part of a class, is com-
 “ prehended in another class, and this in a third;
 “ then the first class must comprehend some indi-
 “ viduals belonging to the third.” Again, “ if one
 “ class universally excludes another which is wholly
 “ or partially comprehended under a third, the first
 “ is partially excluded from the third.” And vice-
 versâ, “ if one class is universally comprehended
 “ under another, from which a third is wholly ex-
 “ cluded, this third is wholly excluded from the
 “ first.”

The first branch of this rule applies to the modes *Bramantip* and *Dimaris*: the second to *Fesapo* and

Fresison: and the third to *Camenes*. The terms of the rule shew that this figure admits of no negative premiss unless it be universal, and of no universal conclusion unless it be negative.

Perfici igitur et revocari atque reduci dicimus indirectos, cum per modum aliquem directum illationis suæ vim demonstrant. Et definitur *Reductio*, imperfecti modi in perfectum mutatio, quo necessitas illationis fiat ex inevidenti evidens. Fiet autem, quando evidenter (h. e. in primâ) ostenditur conclusionem vi præmissarum vel 1. talem esse; vel 2. aliam esse non posse. Unde *Reductio* est vel *ostensiva* vel *ad impossibile*.

Reduction is properly defined, "The change of a syllogism in one figure into an equivalent syllogism in another figure."

But that branch of reduction which is employed to demonstrate the validity of the argument in the latter three figures by an appeal to the principle of the first figure is defined, as above, "The changing an indirect mode into a direct mode, for the purpose of rendering evident the necessity of its inference."

1. This reduction is *ostensive* or *direct* when the new premises in the first figure authorize either the identical conclusion of the original syllogism, or a conclusion from which the original conclusion can be legitimately inferred by conversion.

2. The reduction is *indirect* or *ad impossibile* when the correctness of the conclusion is proved by tracing the contradiction and absurdity which would necessarily follow its denial.

Utriusque praxin pro modis nominatis docent ipsa modorum nomina a scholasticis in hunc finem conficta. Nam in iis tres vocales sunt totidem propositiones syllogismi suâ quantitate et qualitate signatæ. Consonæ initiales B. C. D. F. notant modum primæ, ad quem fit reductio. S. P. propositionem, quam vocalis proxime antecedens designat, esse in reductione convertendam: S simpliciter; P per accidens. M transponendas esse præmissas. K reductionem fieri per impossibile, i. e. pro præmissâ, cujus symbolo adhæret, sumendam esse conclusionis contradictoriam. Quibus ex præscripto factis, colligitur in primâ conclusio vel expositæ eadem, vel eam inferens, vel præmissæ contradictoria, ut in exemplo.

<i>cEs</i>	Nullum	A	est	B
<i>Ar</i>	Omne	C	est	B: <i>Ergo</i>
<i>E</i>	Nullum	C	est	A.

ad

<i>cE</i>	Nullum	B	est	A
<i>lA</i>	Omne	C	est	B: <i>Ergo</i>
<i>rEnt</i>	Nullum	C	est	A.

<i>dIs</i>	Aliquod	B	est	A
<i>Am</i>	Omne	B	est	C: <i>Ergo</i>
<i>Is</i>	Aliquod	C	est	A.

ad

<i>dA</i>	Omne	B	est	C
<i>rI</i>	Aliquod	A	est	B: <i>Ergo</i>
I	Aliquod	A	est	C.

<i>bAr</i>	Omne	A	est	B
<i>Ok</i>	Aliquod	C non est	B: <i>Ergo</i>	
O	Aliquod	C non est	A.	

ad

<i>bAr</i>	Omne	A	est	B
<i>bA</i>	Omne	C	est	A: <i>Ergo</i>
<i>rA</i>	Omne	C	est	B.

§. 7. *De Reductionis validitate.*

REDUCTIONIS ostensivæ validitas sic ostenditur. Ex præmissis reducendi, per conversionem imperatam, necessario colliguntur præmissæ reducti: atque ex iis, per figuram primam, conclusio reducti: quæ vel ipsa conclusio reducendi erit, vel per illativam conversionem fiet.

In ostensive reduction, the significant consonants attached to the vowels which symbolize the *premisses* imply directions to make the requisite changes. The new premisses being thus obtained, the conclusion is to be deduced immediately from them. The comparison of this new conclusion with that of the original syllogism affords the required evidence of validity. When no significant consonant is subjoined to the symbol of the conclusion, (as in

Cesare, Felapton,) the two conclusions are the same. But when *s* or *p* follow the final vowel, the new conclusion will be found reducible to the original conclusion by simple or accidental conversion.

For example :

- cEs* *The fixed stars do not revolve about a centre ;*
A *The planets revolve about a centre : Therefore,*
rE *The planets are not fixed stars.*

To illustrate the correctness of this method of reasoning, let the premises be so arranged, or changed for others equivalent to them, as to reduce them into the first figure. This will be effected by the simple conversion of the major premiss, as intimated by the *s* annexed to its symbol. The new premises, as the initial *c* denotes, will be in the mode *Celarent* : thus,

No heavenly bodies which revolve about a centre are fixed stars ; All planets are heavenly bodies which revolve about a centre : from which premises the conclusion must be, The planets are not fixed stars.

Again ;

- dA* *Every modification of pride is sinful ;*
tIs *Some modifications of pride are approved and encouraged by the majority of mankind.*
I *Some things approved and encouraged by the majority of mankind are sinful.*

In the name *Datisi*, the letter *t* has no symbolic meaning. The argument is thus reduced to *Darii* by the simple conversion of the minor premiss :

Every modification of pride is sinful ; Some things approved by the majority of mankind are modifications of pride : Therefore some things approved by the majority of mankind are sinful.

Again, let the following syllogism be given :

- fE* *Polished brass is not gold ;*
lAp *Polished brass glitters :*
tOn *Not-all that glitters is gold*

Here, the letters *l, t, n,* are not symbolic. *P* denotes the conversion *per accidens* of the minor premiss, to the symbol of which it is annexed. This single change reduces the premiss into the mode *Ferio*; viz. *Polished brass is not gold; but some things which glitter are polished brass.* And the evident conclusion is the same; *Some things which glitter are not gold.*

Again;

frEs Reason is not instinct;

Is Instinct is a kind of natural sagacity:

On Some kind of natural sagacity is not reason.

Thus reduced to *Ferio*:

Instinct is not reason; Some kind of natural sagacity is instinct: Therefore some kind of natural sagacity is not reason.

Again;

dIs Some acts of friendship militate against justice.

Am All acts of friendship appear virtuous and splendid to the thoughtless: Therefore,

Is Some things which appear virtuous and splendid to the thoughtless militate against justice.

The significative consonants which affect these premises are *s* and *m*. The latter teaches that the premises are to be transposed. The former shews that the simple converse of the major premiss is to constitute the new minor premiss. These changes produce the following premises in the first figure in *Darii*:

All acts of friendship appear virtuous and splendid to the thoughtless. Some acts which militate against justice are acts of friendship: from which new premises, the direct conclusion is, *Some acts which militate against justice appear virtuous and splendid to the thoughtless.* Of which the original conclusion

is the simple converse ; as the final *s* in *Disamis* intimated. Thus that conclusion and the mode in which it is drawn are shewn to be valid.

Again ;

- cAm* *The passions are common to brutes ;*
Es *The virtues are not common to brutes :*
trEs *The virtues are not passions.*

Thus reduced to *Celarent* :

No qualities common to brutes are virtues ; The passions are qualities common to brutes : Therefore the passions are not virtues.

Again ;

- brAm* *Worldly honours are transient vanities ;*
An *Transient vanities are sources of certain disappointment : Therefore*
tIp *Some sources of certain disappointment are worldly honours.*

The transposition of the premises produces the following new antecedent, in *Barbara* :

All transient vanities are sources of certain disappointment ; Worldly honours are transient vanities. The conclusion from which premises is ; Worldly honours are sources of certain disappointment : of which the original conclusion is the converse per accidens ; and is therefore inferible from it.

Reductionis per Impossible validitas sic ostenditur. Quoniam præmissæ ex hypothesi sunt semper veræ, ergo contradictoria præmissæ nunquam vera: ergo contradictoria conclusionis nunquam vera: (nam has simul veras esse demonstratur in Barbara) ergo contradictoria conclusionis semper falsa: ergo conclusio ipsa semper vera.

The argument *ab impossibili* consists in the hypothetical concession of the falsehood of that which is the subject of discussion, and in the tracing of such concession to its consequences, so as to shew that it necessarily involves some manifest absurdity or impossibility. As truth cannot be either absurd or impossible, it follows that the thing conceded is not true; and consequently the dependence of the proposition contended for on the premises from which it has been deduced is incontrovertible.

When therefore this method of reasoning is applied to the reduction of Syllogisms, the following process is adopted. The proposition to be established is that the conclusion deduced by a certain mode of syllogism is valid; that is, is necessarily true provided the premises be true. To prove this it is *pro tempore* conceded, that although the premises are true, yet the conclusion is false. And from this concession it is shewn, by the change directed in each case, that one of the premises must unavoidably be false: and consequently that the objector, if consistent, must be guilty of the absurdity of believing the same thing to be at once both true and false.

This kind of reduction is necessary only in those two modes in which one premiss is *particular negative*; namely, *Baroko* and *Bokardo*. And the technical method consists in substituting the contradictory of the conclusion for the particular negative premiss, as is denoted by the symbol *k* attached to it. For example,

bA *The contented are happy;*
 rOk *Some men are not happy:*
 O *Some men are not contented.*

In the place of the minor premiss, to which the symbol *k* is attached, substitute the contradictory of the conclusion: the new premises will then be, in *Barbara*,

*The contented are happy ;
All men are contented :*

whence is deduced the direct conclusion, *All men are happy.*

Now the original premises are (by hypothesis) true ; therefore the contradictory of either of them is false : but the new conclusion is the contradictory of the original minor premiss : therefore that new conclusion is false. But that conclusion is correctly inferred from the premises in *Barbara*. Therefore one of those premises is false : this cannot be the major premiss, (which is the same as the original major, and has been granted to be true :) therefore the minor premiss is false : therefore its contradictory is true : but its contradictory is the original conclusion : therefore the original conclusion is true, and correctly inferred from the premises.

Again ;

*bOk Some legal coins possess no intrinsic value ;
Ar All legal coins have an adventitious value :
dO Some things which have an adventitious value
possess no intrinsic value.*

By adopting the contradictory of this conclusion for a major premiss, and retaining the minor premiss, the following syllogism will be produced in *Barbara*.

All things which have an adventitious value possess also an intrinsic value ;

*All legal coins have an adventitious value :
All legal coins possess an intrinsic value.*

But this conclusion is false, for it contradicts the original premiss : therefore the new major premiss is false : therefore its contradictory, which is the original conclusion, is true.

The reduction *ad impossibile* may be entirely superseded by the use of the method of *conversion by contraposition*, described on pages 124—126. In both the modes in question, (*Baroko* and *Bokardo*),

the major premiss must be converted in this manner ; and in *Bokardo* the premises must be transposed.

Let the following be a syllogism in *Baroko* :

*Profitable property will produce an income more than sufficient to replace the expenses attendant on it ;
But some coal-mines will not produce such an income ;
Therefore some coal-mines are not profitable property.*

By converting the major premiss by *contraposition*, the minor premiss is rendered affirmative, (the negative particle being combined with the predicate,) and the new syllogism is in *Ferio*. Thus : *Whatsoever will not produce an income more than sufficient to replace the expenses attendant on it is not profitable property ; But some coal-mines will not produce such an income : Therefore some coal-mines are not profitable property.*

Again, let the following syllogism in *Bokardo* be given to be reduced.

Some systems of unjust exaction have not been followed by immediate punishment ;

All systems of unjust exaction incur guilt :

Therefore, some things which incur guilt have not been followed by immediate punishment.

By converting the major premiss by *contraposition*, and transposing the premises, a syllogism is formed in *Darii* ; thus,

All systems of unjust exaction incur guilt ;

*Some things which have not been followed by immediate punishment are systems of unjust exaction :
Therefore,*

Some things which have not been followed by immediate punishment incur guilt.

The conclusion from the original premises is the simple converse of the new conclusion, and consequently inferible from it.

The latter process may be more simply described

thus; by combining the negative with the major extreme the syllogism is reduced to *Disamis*, and the reduction to the first figure may be performed according to the directions given for that mode.

§. 8. *Figurarum Regulæ speciales.*

PERSPICUUM est ex antedictis

I. Syllogismos simplices, certo atque necessario concludentes, fieri 24 modis: 6 in qualibet figurâ.

II. Et in aliquo istorum modorum probari posse conclusionem quamlibet de inesse: nempe A uno modo, E quatuor, I septem, O duodecim. Et rursus; in primâ, conclusionem quamcunque: In secundâ, omnes et solas negativas: In tertiâ, omnes et solas particulares: In quartâ, quamlibet præter A. De præmissis denique, quod in primâ et secundâ, major semper universalis est: in primâ et tertiâ, minor affirmativa: In secundâ, præmissarum altera negativa: aliaque ejusmodi; quæ ipsa modorum nomina satis indicant.

An *universal affirmative* conclusion can be deduced only from two universal affirmative premises, in the first figure, in the mode *Barbara*.

Universal negative conclusions may be proved by the first figure, in *Celarent*; by the second figure, in *Cesare* and *Camestres*; and by the fourth figure, in *Camenes*.

Particular affirmative conclusions may be proved, by fig. 1. in *Darii* and *AAI*.—by fig. 3. in *Darapti*, *Disamis*, and *Datisi*;—by fig. 4. in *Bramantip* and *Dimaris*.

Particular negative conclusions may be proved by each of the figures: namely, in *Ferio*, of the first figure; *Festino*, *Baroko*, in the second figure; *Felapton*, *Bokardo*, and *Ferison*, of the third; *Fesapo*, and *Fresison*, of the fourth figure; together with the subalternates of the four modes by which universal negatives are proved.

The following table represents the propositions, according to their quantity and essential quality, which are admissible in each figure.

<i>Fig.</i>	<i>Major Premiss.</i>	<i>Minor Premiss.</i>	<i>Conclusion.</i>
1.	Universal.	Affirmative.	Any.
2.	Universal.*	Any.	Negative.
3.	Any.	Affirmative.	Particular.
4.	Any but O.	Any but O.	Any but A.

* In the second figure, one of the premises must be negative.

These special rules have already been shewn (p. 178, and 181—183.) to flow immediately from the general principles, on which the figures depend.

But they may also be established by the following technical analysis of each figure.

FIRST FIGURE,

A, E.		MED.....Maj.
A, I.		Min.....MED.
A, I, E, O.		Min.....Maj.

Rule 1. *The Minor Premiss must be affirmative.*

For if otherwise, let it be negative: then the major premiss must be affirmative; and the conclusion must be negative. The affirmative major does not distribute the predicate, which must, by the figure, be the major extreme. But the conclusion, being negative, distributes that major extreme. Therefore the process of this extreme is illicit. Therefore the minor premiss must not be negative: that is, *it must be affirmative.*

Rule 2. *The Major Premiss of the first figure must be universal.*

For the minor premiss must be affirmative: therefore the middle term, which is its predicate, is not distributed. Therefore it must be distributed in the major premiss, in which, by the figure, it is the subject. But universals alone distribute their subject. Therefore *the Major Premiss must be universal.*

SECOND FIGURE.

A; E.	Maj.....MED.
E, O; A, I;	Min.....MED.
E; O.	Min.....Maj.

Rule 1. *One of the premises in the second figure must be negative.*

For the figure requires that the middle term be the predicate of both the premises. But if both are affirmative, the middle term is not once distributed: for negatives alone distribute the predicate. Therefore *one of the premises must be negative.*

Rule 2. *The Conclusion in the second figure must be negative.* Because one of the premises must be negative.

Rule 3. *The Major Premiss in the second figure must be universal.*

For, the conclusion being negative, the major extreme is distributed. It must therefore be distributed in the major premiss; in which it is the subject. But universals alone distribute the subject: Therefore *the major premiss must be universal.*

THIRD FIGURE.

A, E, I, O.		MED.....Maj.
A, I.		MED.....Min.
I, O.		Min.....Maj.

Rule 1. *The Minor Premiss must be affirmative.*

For, if it were negative, the major premiss must be affirmative, and consequently would not distribute its predicate, which is the major extreme. But the conclusion, being negative, would require the distribution of that extreme. Therefore the process would be incorrect. Therefore *the minor premiss must be affirmative.*

Rule 2. *The Conclusion of the third figure must be particular.*

For the minor premiss (which must be affirmative) does not distribute the predicate, which, by the figure, is the minor extreme. Therefore the minor extreme cannot be distributed in the conclusion. But particulars alone have the subject undistributed. Therefore *the conclusion must be particular.*

FOURTH FIGURE.

A, E, I.		Maj.....MED.
A, E, I.		MED.....Min.
E, I, O.		Min.....Maj.

Rule 1. *A particular negative premiss is inadmissible.*

1. If the *major* premiss be particular negative, the major extreme, being its subject, is not distributed. But the conclusion must be *O*, in which that extreme must be distributed. Therefore an illicit process occurs. Therefore the *major premiss may not be particular negative.*

2. If the *minor* premiss be *O*, the middle term, which is the subject, is not distributed. But the major premiss must be *A*. Therefore the medium, which is the predicate, is again undistributed. Therefore *the minor premiss may not be O.*

Rule 2. *An universal affirmative conclusion cannot be proved in the fourth figure.*

For such a conclusion can be deduced only from universal affirmative premises. But the minor extreme is, by the figure, the predicate of its premiss. Therefore it is not distributed. Therefore it cannot be distributed in the conclusion. Therefore *the conclusion cannot be universal affirmative.*

An acquaintance with these rules simplifies the method of scrutinizing an argument. When a syllogism is reduced to form, it becomes easy, by comparing it with the special rules of the figure to which it belongs, to decide whether the conclusion has a real dependence on the premises, and is legitimately deduced from it. The occasional exercise of thus analyzing a good parliamentary debate, or a judicial speech, would tend to produce a tact and readiness in discerning the force and cogency of an argument, and a perspicuity (free however from the technicality of formal syllogism) in expressing a train of reasoning. The promiscuous syllogisms given at the close of the Appendix will serve as a more simple exercise of the same nature.

The following table presents at one view the special rules of the figures, with their respective proofs.

<i>Fig.</i>	<i>Rules.</i>	<i>Proofs.</i>
1.	Minor premiss affirmative Major premiss universal	Else illicit process of the major term. Else the middle term not distributed.
2.	One premiss negative Conclusion negative Major premiss universal	Else the middle term not distributed. Because a negative premiss. Else illicit process of major term.
3.	Minor premiss affirmative Conclusion particular	Else illicit process of major term. Else illicit process of minor term.
4.	Major premiss not O Minor premiss not O Conclusion not A	Else illicit process of major term. Else the middle term not distributed. Else illicit process of minor term.

The subsequent examples exhibit errors against each of these rules.

I. 1. *Self-denying acts of virtue are followed by an inward satisfaction ; but the exercise of gratitude is not a self-denying act of virtue ; and consequently is not followed by any inward satisfaction.*

Air is essential to the support of human life ; but the light of the sun is not air : therefore the light of the sun is not essential to the support of human life.

2. *Some of the ancient Greeks had confessedly a much higher relish for all the beauties of oratory than the moderns. But among the ancient Greeks are to be reckoned the Lacedæmonians ; these therefore had a higher relish than the moderns for the beauties of oratory.*

Some animals have been discovered imbedded in stone, in which they must apparently have existed since the deluge ; but all elephants are animals ; therefore some elephants have been found imbedded in stone apparently from the time of the deluge.

II. 1, 2. *Whatsoever is better than strength is peculiarly characteristic of man as distinguished from the brute creation : reason, for instance, is peculiarly characteristic of man in that preeminent point of view : reason, therefore, is better than strength.*

The electric fluid is a very subtle penetrating substance : the galvanic fluid is also a very subtle penetrating substance : therefore the galvanic fluid is the same as the electric fluid.

3. *Some implements of husbandry are of modern invention ; but ploughs are not of modern invention : therefore some ploughs are not implements of husbandry.*

Some vegetable substances are specifically lighter than water ; but no metals are specifically lighter than water ; therefore some metals are not vegetable substances.

III. 1. *The Epicureans thought that the universe was created by the casual concurrence of atoms. But*

the Epicureans were not Peripatetics: The Peripatetics therefore did not hold that doctrine.

2. *If it cannot be denied that every act of virtue is beneficial to society; and is at the same time an act advantageous to the individual who performs it: must it not follow that whatever act is advantageous to the agent is likewise beneficial to society?*

IV. 1. *There have been men of great eminence who have not had the advantage of a liberal education; but those who have enjoyed that advantage are responsible for the good employment of every talent with which they have been endowed: therefore some of those who are thus responsible have not been men of great eminence.*

2. *All those objects which afford pleasure to the imagination are at once great, and uncommon, and beautiful; for, whatever combines these three qualities seems to enlarge the mind, to gratify curiosity, and to diffuse a delightful satisfaction and interest throughout the soul: and it is evident that whatever produces these effects must afford pleasure to the imagination.*

Atque hinc facile colligitur, inspecto schemate modorum, quali medio probanda sit quæstio omnis de inesse. E. g. Quæstio A probatur in *Barbara*; medio, de quo prædicatum quæstionis universaliter affirmatur, quodque de subjecto quæstionis affirmatur itidem universaliter: et sic de cæteris.

Thus, *I* may be proved, either by a middle term wholly comprehended under the predicate and partially comprehending the subject, as in *Darii*: or by a middle term representing a class or individual of which both extremes are qualities, as in *Darapti*,

Disamis, and *Datisi*: or by a middle term comprehending the predicate and comprehended by that class of which the subject represents a portion, as in *Bramantip* and *Dimaris*.

Again, to prove *O*, any one of the four principles on which the figures are respectively founded may be employed.

Adverte tamen quod imperite disputantis est afferre modum innominem: ponet enim in præmissis plusquam opus est ad conclusionem. Quare et innomines hæctenus sunt incensi; quamvis negari nequeant, sicubi per inscitiam adhibentur.

See the observations on the twelfth rule of structure, page 158—160.

Adverte etiam, quod figura quarta tribus cæteris deterior est: cum aliis de causis, tum ex hoc præsertim, quod medium dicat de majori, hunc de minori, minorem de medio, h. e. medium nugatorie de seipso.

For instance:

All metaphysical enquiries are involved in some degree of obscurity:

But all things involved in obscurity are liable to much error:

Therefore some things liable to error are metaphysical enquiries.

This syllogism predicates the medium *involved in obscurity* of the major term *metaphysical enquiries*; this is predicated (in the conclusion) of the minor term, *things liable to error*: and this minor term is

predicated (in the minor premiss) of the medium *involved in obscurity*. That is, the class or aggregate denoted by the term, *things involved in obscurity*, is represented to comprehend all *metaphysical enquiries*; the term *metaphysical enquiries* is asserted to comprehend *some things liable to error*; and *some things liable to error* are represented to comprehend *every thing that is involved in obscurity*. Thus it is implied, in a circle, that the middle term, *things involved in obscurity*, comprehends *things involved in obscurity*; which is nugatory.

The same observation applies also to each of the *extremes*: Thus, by tracing the terms in a retrograde order, we find it asserted that the major extreme, *metaphysical enquiries*, is predicated of the minor extreme, *things liable to error*; this is predicated of the middle term, *things involved in obscurity*; and this again of the major extreme, *metaphysical enquiries*: that is, the major extreme is nugatorily predicated of itself.

The fourth figure is indeed useless; and is introduced only for the sake of displaying all the possible modes of syllogistic argument. It is probable that it has seldom, if ever, been employed in the course of real argument; and the mind seems to revolt from every example of it which is adduced even for the purpose of illustration.

The first figure is sometimes made to assume the appearance of the fourth by the transposition of its premises: a transposition which is strongly urged by some as the proper order. Their chief argument however is derived from an inaccurate conception of the nature of the *middle term*. Overlooking its connexion with the extremes, and thus neglecting to advert to the meaning of the word *medium* as bearing reference to its correlates *major* and *minor*, (as illustrated under the first rule of structure, page 140.) they take the word only in a mechanical sense,

as implying that it occupies the middle place. They would therefore argue thus :

A child bearing testimony in its father's cause is an interested witness : but interested witnesses are not admissible in courts of justice : therefore a child bearing testimony in its father's cause is not admissible in courts of justice.

But such an arrangement is obviously unphilosophical. Whereas the statement in the first place of the broad incontrovertible principle, *Interested witnesses are not admissible in courts of justice*, prepares the mind for an involuntary acquiescence in the subordinate assertion, that *a child bearing testimony in its father's cause (being an interested witness) is not admissible in courts of justice.*

§. 9. *De Enthymemate, &c.*

SYLLOGISMIS etiam adnumerantur aliæ argumentorum species; quæ nec stricte loquendo Syllogismi sunt, nec ita tamen peccant, ut propterea mereantur excludi: in quibus scilicet reticetur argumenti pars aliqua, sed quam proclive est cogitatione substituere.

1. *Enthymema* ; cujus antecedens constat propositione et judicio ; nam judicium est propositio in mente ; e. g. *Homo est animal ; ergo est vivens.* Dicitur etiam Aristoteli *Syllogismus Oratorius* ; et, si integra ejus vis contineatur in unicâ propositione, *sententia Enthymematica* ; utrumque Quintiliano *sententia cum ratione* ; ut, *Mortalis cum sis, immortale ne geras odium.* Deest illi ad Syllogismum altera

præmissarum ; utrum vero major an minor, ex quæstione dignoscitur.

In an *enthymem*, the conclusion is drawn from two premises of which only one is expressed. It is, as to form, a defective syllogism, in which the writer or speaker relies on the common sense of his reader or hearer to supply the suppressed premiss. Hence it is said that the antecedent consists of a proposition and a judgment : that is, of one premiss expressed and the other implied.

Every *enthymem* contains the three terms of the syllogism which it represents. One of these terms (namely, one of the extremes of the question) occurs twice ; the middle term and the other extreme are each expressed but once. The suppressed premiss is to be supplied by comparing with the middle term that extreme which occurs only once.

For example : *The human soul is immaterial ; consequently it is immortal.* Here the conclusion is, *The human soul is immortal.* The minor extreme is, *the human soul* ; which term also occurs in the expressed premiss, *The human soul is immaterial.* This is therefore the minor premiss. And it compares its extreme with the middle term *immaterial.* The major extreme is *immortal* ; and the suppressed proposition is, *Every thing immaterial is immortal.* The complete syllogism therefore is in *Barbara* ; namely,

*Every thing immaterial is immortal ;
But the human soul is immaterial ;
Therefore the human soul is immortal.*

It is most frequent, in enthymems, to express the minor premiss ; since this is usually more liable than the major to be called in question. The major premiss is generally a proposition of a more

general nature, and therefore better known, and less exposed to contradiction or doubt.

For instance : *We enjoy a greater degree of political liberty than any civilized people on earth, and can therefore have no excuse for a seditious disposition.* The major premiss is here understood ; *Those who enjoy a greater degree of political liberty than any other civilized people on earth, have no excuse for a seditious disposition.*

The power of ridicule is a dangerous faculty ; since it tempts its possessor to find fault unjustly, and to distress some for the gratification of others. This sentence comprehends two enthymems ; for there are two middle terms. And the major premises respectively implied in each are, *That which tempts its possessor to find fault unjustly is a dangerous faculty ;* and, *That which induces its possessor to distress some for the gratification of others is a dangerous faculty.*

Those only who understand other languages are competent to treat correctly of the principles of their own ; since such a competency requires a philosophical view of the nature of language in general. Here the major premiss is suppressed, and the sense of the direct conclusion is more emphatically conveyed by the use of its contrapository converse. The syllogism is in *Barbara* :

All who have a philosophical acquaintance with the general nature of language understand other languages besides their own ;

All who are competent to treat correctly of the principles of their own language have a philosophical acquaintance with the general nature of language ;

Therefore, all who are competent to treat correctly of the principles of their own language understand other languages besides their own.

Or by retaining the contrapository form throughout, it may be thus stated, in *Celarent* :

Those who have not a philosophical view of the general nature of language are not competent to treat correctly of the principles of their own ;

But those who do not understand other languages have not a philosophical view of the general nature of language ;

Therefore, those who do not understand other languages are not competent to treat correctly of the principles of their own.

Or again it may be thus expressed,

Whatever requires a philosophical view of language in general requires an acquaintance with more than one language ;

The ability to treat correctly of the principles of our own language requires a philosophical view of language in general ;

Therefore, that ability requires an acquaintance with more than one language.

If however it happens that the minor premiss is very obvious ; or if it is desirable to give a particular prominence and emphasis to the major premiss, the former is suppressed. For example : *During every protracted war it happens (for whatever throws capital into new channels will produce this effect) that various profitable branches of commerce are carried to a great extent : that is,*

Whatever throws capital into new channels occasions the carrying various profitable branches of commerce to a great extent.

But every protracted war throws capital into new channels.

Therefore, every protracted war occasions the carrying various profitable branches of commerce to a great extent.

The minor premiss, though essential to the argument, was too well known to the audience to which it was addressed, to require a formal statement.

Ridicule is a dangerous weapon ; for such, in fact,

is every talent by which a man stirs up a secret enmity against himself. The suppressed premiss is the minor; *Ridicule is a talent by which a man stirs up a secret enmity against himself.*

The enthymematic form is best adapted to the first figure. It is indeed rarely thought necessary to express both the premises in this figure, unless it be for the purpose of adding some explanation or modification, or an incidental argument to confirm them. Thus no one can hesitate to fill up the logical ellipsis, when he reads, *The study of mathematics is essential to a complete course of education, because it induces a habit of close and regular reasoning*; in which the major premiss is omitted: or, *So great is the importance of a habit of close and regular reasoning, that the study of mathematics must be essential to a complete course of education*: in which the minor premiss is omitted. The syllogism is in *Barbara*:

Whatever induces a habit of close and regular reasoning is essential to a complete course of education:

The study of mathematics induces a habit of close and regular reading:

Therefore the study of mathematics is essential to a complete course of education.

In the second figure the enthymem is not so uniformly employed, because it frequently occurs that neither of the premises is more obvious or general than the other. For example, the syllogism,

Involuntary infirmities excite compassion rather than reprehension; which is by no means the case with vicious habits; these therefore cannot be judged to be involuntary; is a more natural form than the enthymem, *Vicious habits must not be classed among involuntary infirmities, because they do not excite compassion, but rather reprehension.*

The third figure is, for the same reason, still less

frequently expressed in a form purely enthymematical. The two premises are however very commonly compressed into one sentence; which gives to the argument the appearance, although not the exact character, of the enthymem. For instance;

A man remarkable for the knowledge of nature and of policy, the wisdom of his maxims, the justness of his reasoning, and the variety, distinctness, and strength of his characters, may want exactness in his diction and be careless in the art of writing; for we find both these qualities united in Lord Clarendon.

Here the last clause represents two premises; *Lord Clarendon wants exactness, &c.; Lord Clarendon was a man remarkable for the knowledge of nature, &c.*

Again; *Hard substances may be elastic; for ivory is both hard and elastic.*

A correct enthymem may often appear to contain more than three terms; but this is occasioned merely by the deviation from strict form. For instance;

Whatever is done skilfully appears to be done with ease; and art, when it is once matured to habit, vanishes from observation. We are therefore more powerfully excited to emulation by those who have attained the highest degree of excellence, and whom we can therefore with least reason hope to excel. That is,

Acts performed with the greatest apparent ease are the most powerful excitements to emulation:

But the acts of those who have attained the highest degree of excellence and whom we can with least reason hope to surpass are performed with the greatest apparent ease;

Therefore the acts of such persons are the most powerful excitements to emulation.

The usual form of an enthymem is that of a complex causal sentence. But its force is often

concentrated into one simple grammatical sentence: which is denominated an *enthymematic sentence*. Thus the single proposition, *The example of Virgil shews that even a great poet may be seduced into some faults by the practice of imitation*, represents the following syllogism in *Darapti*.

Virgil was seduced into faults by imitation;

Virgil was a great poet; Therefore

Some great poet has been seduced into faults by imitation.

Again: *The apparent insufficiency of every individual to his own happiness or safety compels us to seek from one another assistance and support*. This appears at first sight to be no more than a simple proposition. But it involves an argument; it consists in the application of a general principle to a particular case. It is equivalent to,

All beings which are manifestly insufficient to their own happiness or safety are compelled to seek from each other assistance and support: But every individual of the human race is so: Therefore every individual, &c.

Thus Nehemiah's question, *Should such a man as I flee?* involves the following argument: *They who are raised up by Divine Providence to accomplish a great and beneficial undertaking, should not be ready to flee from the appearance of danger: but such am I; I ought not therefore to flee.*

Again, the query of the unbelieving Pharisees was an enthymematic sentence: *How can a man that is a sinner do such miracles?* The following syllogism represents the train of thought which suggested that question: *Sinners are not endued from above with the power of working miracles: this man is a sinner: therefore he is not endued with the power of working miracles*. Their minor premiss was false; and therefore, (the consequence, or connexion of the conclusion with the antecedent, being correct,) their inference was also false.

Demosthenes very forcibly compresses three arguments into one enthymematic sentence, when, in stirring up his country to espouse the cause of the democratic party in Rhodes against the aristocracy, and their ally the Queen of Caria, he says,

Οὐκ αἰσχρὸν, εἰ ὑμεῖς, ὄντες Ἀθηναῖοι, βάρβαρον ἄνθρωπον, καὶ ταῦτα γυναῖκα, φοβηθήσεσθε;

Two arguments are emphatically contained in the following sentence;

Αἰσχρὸν ἔστιν ἄρχειν σε, εἴνα Ἀθηναῖον, Πελοποννησίων καὶ Λακεδαιμονίων. (*Anab.*) Xenophon was *but an individual*, and he was an *Athenian*; this would render his authority obnoxious to Lacedæmonians; that, to all accustomed to a popular or mixed government.

The argument from the frailty of human nature is very frequently thus implied in the poets, and other writers. For instance; Πρᾶγος δ' ἀτίζειν οὐδὲν ἄνθρωπον χρέων. (*Soph.*) - that is, ἄνθρωπον ὄντα, οἱ εἶπερ ἄνθρωπος εἰμι. Again, Τὸ γὰρ ἀμαρτάνειν, ἀνθρώπους ὄντας, οὐδὲν οἶμαι θαυμαστόν. (*Xen.*) Σὺ οὐκ οἶδας, ἄνθρωπος εἶν, κῶς χρεὶ τὸ βέβαιον. (*Herod.*)

The following are examples of enthymems and enthymematic sentences.

Real learning is too valuable a thing to be within the grasp of the idle.

I ask your lordships, whether parliament will be in a state to transact public business, or be attended by a sufficient number of members, while engaged in preparing for a public election.

The meanest individual may apply to the law for his defence; for actual safety and the full assurance of safety are alike the right of all: that is, All have a right to that safety and assurance of safety which the law provides: and therefore the meanest individual has that right. Or thus, That which is the right of all is the right of the meanest; but the safety which the law provides is the right of all; therefore, &c.

Popular commotions, though commencing on a small

scale, are so liable to ripen into systematic sedition, that they ought to be speedily and decisively checked.

Popular commotions, however small the scale on which they begin, ought to be speedily and decisively checked, on account of their great liability to ripen into systematic sedition.

That which, if left to its own course, though proceeding from circumstances apparently unimportant, has a tendency to advance to systematic sedition, (and this is undoubtedly the nature of all popular commotions, however insignificant in their origin,) calls for a speedy and decisive check.

Shame is not a virtue, for it bears the character of a passion rather than of a habit.

The enthymem is obviously adapted to fallacious arguments; because, although the implied premiss is known, yet the attention is not so strongly arrested to it; and therefore it may be false, or if true may occasion an incorrect reasoning, without being so readily detected. Thus it has been urged, "*I can shew the Protestant that many parts of the Bible are wanting. Where are the books of the Wars of the Lord? the books of Jasher, of Samuel, of Nathan, of Gad, of Iddo, of Ahijah, of Jehu, and of Shemeiah? Where are the songs and the natural history of Solomon, or the Epistle from Laodicea? But if the Protestant has not the whole Bible, that which he has cannot be a sufficient rule of faith to him.*" The first of these arguments, (for the sentence obviously comprehends two) is in the third figure, and assumes for its minor premiss the false proposition, that *the books enumerated were parts of the Bible, or inspired writings.*

The infidel urges, *The New Testament was not written at the date when it professes to have been written, for it was never heard of until the Council of Laodicea.* But the fallacy is detected by completing

the syllogism ; thus, *No series of independent tracts or writings can exist before they are collected into one book and comprised under a common title ; the New Testament is a series of independent tracts or writings ; therefore the New Testament did not exist before it was collected into one book and comprised under a common title.* The major premiss is false.

Again, *Forgery must be punished with death, for it absolutely requires a powerful and decisive check.* That is, *Some powerful and decisive check is requisite to prevent the commission of forgery : but the infliction of death is a powerful and decisive check ; therefore the infliction of death is requisite to prevent the commission of forgery.* But this is unsound, the middle term being undistributed. Or if thus represented, *Whatever is the only decisive check is requisite to prevent forgery ; but death is the only decisive check, &c.* the minor premiss lies open to controversy.

2. *Inductio ; in quâ ponitur quantum opus est de singulis, et deinde assumitur de universis ; ut, Hic et ille et iste magnes trahit ferrum ; ergo omnis.* Est igitur Enthymema quoddam ; nempe Syllogismus in Barbara, cujus minor reticetur.

Induction is the derivation of general propositions from singular objects, and from those general propositions others still more general, and so on, till the mind arrives at the most general propositions, which, both on account of their priority in the order of nature, and of their use in syllogistic reasoning, are called *principles*.

It has been before observed, that syllogistic reasoning is founded on certain general principles, and that its appropriate office is to reduce those

principles to that particular application which renders them practically useful in scientific pursuits, and in the direction of conduct in common life. A natural enquiry therefore suggests itself: whence are these principles derived? Many of them may indeed be syllogistically traced back to principles more general; and these again to others of a still more general nature. But sooner or later the mind is checked in this career. It arrives at principles in which indeed it cannot but acquiesce; but the truth of which it cannot syllogistically demonstrate.

Of these principles, some rest solely on *testimony* or *authority*. The majority of mankind, for instance, implicitly receive their religious and philosophical tenets from their immediate ancestors, as these also did from theirs; and thus error is perpetuated. So also a student may suppose himself to be following the dictates of his own mind, while he is really influenced by esteem for the judgment of the author whom he studies, or of the instructor to whose guidance he intrusts himself. But the only general principles which ought to rest on external testimony, are those of religious doctrine and obligation, which depend on the immediate authority of Him who cannot deceive or be deceived. Human testimony, strictly speaking, is to be received only in relation to individual facts: not for the establishment of general principles.

The principles acquired by human powers have been, by many, considered as twofold. Some have been supposed to be *intuitive*; and these are commonly called *axioms*; their extreme universality entitling them to a certain *ἀξιώματα* or *dignity*, above all propositions of a less comprehensive nature. Such are the mathematical axioms; *The whole is greater than any of its parts. Things equal to the same are equal to each other. Magnitudes which coincide with each other are equal to one another.*

The other class of general principles are those

acquired by *Induction*; which are sometimes called *secondary axioms* or *principles*, sometimes *laws*, sometimes (*ιδίαι*) *forms*.

But this distinction can scarcely be considered correct. It is highly probable, if not certain, that those primary axioms, which have been esteemed intuitive, are in fact acquired by an inductive process: although that process is less discernible, because it takes place long before we think of tracing the actings of our own minds. It is certain that it is often found necessary to facilitate the understanding of those axioms, when they are first proposed to the judgment, by illustrations taken from individual cases. But whether it is, as is generally supposed, the mere *enunciation* of the principle, or the *principle* itself, which requires the illustration, may admit of a doubt. It seems probable, however, that such illustrations are nothing more than a recurrence to the original method by which the knowledge of those principles was acquired. Thus the repeated trial or observation of the necessary connexion between mathematical coincidence and equality first authorizes the general position or axiom relative to that subject. If this hypothesis is correct, it follows that both *primary* and *ultimate* principles have the same nature, being alike acquired by the exercise of the inductive faculty.

Induction bears some analogy to *abstraction*. Both of them commence with individuals, and proceed, by successive comparisons, from these to generals, and from those things which are less general to those which are more general. But there is this essential difference between them; *Abstraction* is simply an instrument of classification, and relates to the formation and arrangement of notions: whereas *Induction* is an instrument adapted to the discovery of laws and principles previously unknown. In proportion, however, as our operations

of abstraction are more correct, scientific, and complete, they approach more nearly to the nature of induction.

An induction in which every individual case is enumerated is a perfect demonstration. And in general, the more nearly we approach to the entire enumeration, the higher is the degree of probability attained by the induction: provided, at least, that facts of an opposite tendency are not discoverable, or if they occur, are satisfactorily shewn not to be *really* inconsistent with the principle deduced. The great error in induction is too great haste in drawing a conclusion without having premised a sufficient number of individual cases. Many, for example, if they have met with or heard of *one or two dishonest lawyers*, or observed *a comet in a warm summer*, think themselves authorized to draw the sweeping inference, that *all lawyers are dishonest*, or *all comets occasion a warm season*. So, because *the earth is watered by rain from the clouds in England, France, Spain, Italy, and every other part of Europe; and the same is found to be the case in the various parts of Asia, Africa, and America, concerning which we may have made enquiry*, it might be erroneously inferred that *every part of the earth is so watered*. Thus also, the medicine of an empiric is supported by a published induction of the many cures effected by it; which succeeds in deluding those who forget to consider how many cases are not published: the majority of which, it may be not unreasonable to suspect, were failures. Correct induction therefore requires much patience, caution, and diligent investigation.

Induction is most frequently employed in the acquisition of physical science, in the prosecution of metaphysical researches, and on subjects of a moral or political nature.

1. *Moral Induction*, or observation of the motives and

effects of human conduct, the influence of education, association, and other circumstances, is the foundation of the moral and political axioms (with the exception of those exclusively derived from divine authority) to which we habitually appeal for the regulation of our conduct in regard to ourselves or society in every new train of circumstances. The man of observation acquires from his historical knowledge, and from the facts which have successively presented themselves to his notice, when judiciously examined and compared with each other, a fund of axioms which he learns to apply syllogistically to any particular case, in relation either to the government of a state, the direction, and instruction of others, or the regulation of his own conduct. Such a man is called *prudent*, and is said to possess a knowledge of human nature.

Moral proverbs are, or profess to be, the results of this kind of induction. The Proverbs of Solomon, though they also rest on the higher and indubitable foundation of inspiration, are general axioms, the result of the observations and comparisons of the wisest of men.

Aristotle adopts the inductive form, when he enumerates all the virtues; (viz. fortitude, temperance, liberality, magnificence, magnanimity, lenity, friendliness, veracity, politeness, modesty, and justice;) and after having shewn that each of them consists in a medium, infers, *Μεσότητας εἶναι τὰς ἀρετὰς πιστεύομεν ἂν, ἐπὶ πάντων οὕτως ἔχον συνίδοντες.* (*Eth. Nic. iv. 7.*)

Thus the Chorus in the *Antigone* of Sophocles (*ver. 332—365.*) establishes by an inductive process the position, *Πολλὰ τὰ δεινὰ, κούδέν ἀνθρώπου δεινότερον πέλει.*

Again, Artabanus, in Herodotus, (*vii. 18.*) says, *Ἐπιστάμαι ὡς κακὸν εἶη τὸ πολλῶν ἐπιθυμείειν μεμνημένος μὲν τὸν ἐπὶ Μασσαγέτας Κύρου στόλον ὡς ἔκρηξε, μεμνημένος δὲ καὶ τὸν ἐπ' Αἰθίοπας τοῦ Καμβύσεω, συστρατευόμενος δὲ καὶ Δαρείω ἐπὶ Σκύθας.*

The inductive form is ironically employed by Socrates to expose the absurdity of his accuser :

- (Σωκράτης.) Εἰπέ, ὦ ἀγαθὲ, τίς τοὺς νέους ἀμείνους ποιεῖ ;
 (Μέλιτος.) Οὗτοι, ὦ Σώκρατες, οἱ δικασταί.
 (Σωκρ.) Πότερον ἅπαντες ;
 (Μέλ.) Ἄπαντες.
 (Σωκρ.) Τί δὲ δὴ ; οἶδε οἱ ἀκροαταὶ βελτίους ποιοῦ-
 σιν, ἢ οὐ ;
 (Μέλ.) Καὶ οὗτοι.
 (Σωκρ.) Τί δὲ οἱ βουλευταί ;
 (Μέλ.) Καὶ οἱ βουλευταί.
 (Σωκρ.) Ἄλλ' ἄρα, ὦ Μέλιτε, μὴ οἱ ἐν τῇ ἐκκλησίᾳ
 ἐκκλησιασται διαφθείρουσι τοὺς νεώτερους ;
 ἢ κακίονοι βελτίους ποιοῦσιν ἅπαντες ;
 (Μέλ.) Καὶ ἐκεῖνοι.
 (Σωκρ.) Πάντες ἄρα, ὡς ἔοικεν, Ἀθηναῖοι καλοὺς
 καγαθοὺς ποιοῦσι, πλὴν ἐμοῦ.

Plato *Apol. Socr.* §. 12.

The following extract affords another instance of inductive reasoning of the moral kind.

It is evident that paganism must have originated in a wilful departure from the truth. For when we consider, that man was not from the beginning left to himself to discover the true Author of nature, or the worship that was due to him ; but was instructed by immediate communication from his Creator in every thing relative to his spiritual concerns : how can we regard the introduction of false divinities in any other light than that of wilful apostacy from the true God ? Ignorance could not be the cause of Cain's departure from the faith ; nor of the infidelity of his immediate descendants ; neither could it be pleaded in excuse for the children of Seth, emphatically called " the sons of God," when they forfeited their claim to that title, by entering into alliance with the wicked posterity of Cain. The same is to be observed respecting the immediate descendants of Noah, whom we cannot suppose to have been ignorant of the true religion founded on

the expectation of the promised Redeemer, notwithstanding their readiness, so soon after the flood, to renounce that expectation, and to follow their own corrupt imaginations.

This is a perfect induction; for it enumerates all the individuals in whom idolatry could possibly have originated: since by others it has been adopted from imitation only.

A beautiful specimen of moral induction occurs 2 Peter ii. 4—9. The conclusion is twofold; and the sacred writer accordingly adduces a double train of individual instances, strikingly contrasted with each other. The substance of the arguments is this: *The offending angels,—the antediluvian world,—the inhabitants of Sodom and Gomorrah,—were divinely punished; therefore, all the unjust shall be divinely punished.* Again, *The holy angels who did not offend,—Noah, the preacher of righteousness,—and just Lot,—were delivered from trial; therefore all the godly shall be delivered from trial.*

The three introductory chapters of the Epistle to the Romans contain an inductive argument; in which the proposition, *All have sinned*, is inferred to be universally true, because it has been successively proved true, first of all Jews and then of all Gentiles.

Again, the general conclusion in Psalm xxxvii. 23, 24, as deduced from the train of observation mentioned in the subsequent verse;—and that in the 38th verse, as deduced from verses 35, 36, are specimens of moral induction.

2. In *Metaphysical Induction* a great degree of obscurity necessarily prevails. In that branch of metaphysics, for instance, which relates to the powers and operations of the mind, the student has, primarily, but one subject on which he is able to make his observations; namely, his own mind. By habitual reflection, however, he may watch and

scrutinize its operations under the influence of a variety of different circumstances. And he may infer, with a high degree of probability, that the process which he discovers to take place in his own mind, bears a great similarity to that which occurs in the minds of men in general. Yet he is continually liable to be misled in consequence of an inability to distinguish between those operations which are purely natural and common to all who are possessed of mind, and those which are adventitious, the result of early habits, and associations formed long before he had entered on his philosophical speculations.

Next to his own experience, the metaphysician is enabled to improve his acquaintance with the human mind by tracing its operations in those about him. Here he has a wide scope. He learns something from the old and young, the rich and poor, the learned and unlearned, the poet and the philosopher. Yet here also he lies under a great disadvantage; he can only conjecture what passes in the mind of others, by the means of the expressions, the conduct, the countenance, and other external circumstances, which are but imperfect and often inaccurate indices of the real operations of the mind.

The recorded sentiments of other metaphysical students afford a third, but perhaps the most exceptionable help to this species of induction. These should be received with suspicion; for every writer of talent is able so to trace out his opinions on this subject, that the mind of the student is involuntarily borne along; and is made to feel as if its own previous and natural mode of operation were described by the writer, while in fact it does no more than follow the line which is, as it were, arbitrarily marked out for it.

These circumstances retard the progress of this branch of metaphysical science, so that it still con-

tinues and probably will long continue to be in a state of much imperfection.

3. *Physical Induction* consists in the right use of observation and experiment in regard to external objects; and the deduction of correct inferences from them. The most simple process of physical induction is to watch the unbiassed operations of nature. But the results derived from such observation most frequently require to be confirmed by experiments; by which nature is (if we may so speak) compelled to perform her operations under those circumstances and limitations which man sees fit to prescribe. This is usually a long and laborious process; but it is necessary for the investigation of truth. The operations of nature are sometimes too magnificent and extensive for the grasp of our contracted senses; but experiments reduce these operations, as it were, to a miniature form, so as to enable the philosopher to trace at one view their nature, causes, and consequences. They are at other times too subtle, too rapid, or too secret to be observed: they require therefore to be educed by particular experiments, and thus subjected to the scrutiny of the senses.

Thus the geologist follows nature by a protracted and laborious research, wherever he may have opportunities of witnessing the interior formation of the earth, or of receiving facts concerning it from others. On the other hand the philosophical chemist makes nature display itself in his laboratory by repeated experiments.

By means of observation and experiment the natural philosopher at first does no more than make an historical record (either mentally or actually) of the facts or phenomena which have come to his knowledge: he then endeavours to classify those facts; to contrast them with all such facts as appear to be of an opposite nature; and by dividing and

separating essentials from non-essentials, things necessary from things contingent, he determines and distinguishes in every object the nature from its properties and accidents; he traces phenomena to their physical causes or antecedents; divests them of those similarities or differences which are merely apparent; classifies them according to their real relations to each other; and thus discovers those general principles or laws according to which all things are regulated, and the knowledge of which constitutes true science.

For example; the practical miner, on the discovery of a *pebbly red sand-stone*, will probably assert without hesitation that *coal* may be found within a moderate depth from the surface. His induction is however incomplete; he is biassed by localities, and judges without any scientific acquaintance with the structure of the earth. The attempt may be made, and the expectations of the proprietor disappointed. This fact presents an apparent opposition to the general principle that *red sand-stone on the surface indicates coal beneath*. But the philosopher, by more extensive examination, discovers that there is also *another* stratum of *pebbly red sand-stone*, subjacent to the *coal strata*, bearing a very great similarity to the former. By repeated examinations however he discovers certain uniform marks of distinction between the *superincumbent* and the *subjacent* stratum. This discovery at once produces an important step in the advancement of the science, and may rescue many from the toil, expense, and disappointment of seeking coal beneath a stratum to which it must necessarily be superior.

It is thus, also, that the utility of *vaccination* has been established. It was not sufficient that a vast mass of individual instances of *successful* vaccination should be adduced; every search and enquiry has been made to discover *failures*. These have been accurately recorded, and diligently examined. Many

were found to be merely idle reports. Others proved to be instances of real failure. The circumstances attending these cases have, as far as was practicable, been scrutinized. The proportion of failures to the successful cases has been ascertained to an astonishing degree of precision; and the beneficial effects of the practice have by this process been far more undeniably and satisfactorily established, than they would have been by any vague assertion of its universal and unerring efficacy.

The laws or conclusions acquired by induction are syllogistically applied to any new case in which no opportunity of observation or experiment is afforded. But such cases, as soon as observation or experiment can be applied to them, reciprocally become parts of the aggregate from which the conclusion is derived, and consequently are fresh confirmations to the general law. Thus by a syllogistic application of general principles, the laws which regulate the motion of the planet Uranus were ascertained before it had accomplished the tenth part of its orbit from the place in which it was discovered. When observation shall have traced it till its return to that place, those laws will no longer depend on the syllogistic inference; but will be established by induction, and will afford additional confirmation to the already-discovered laws of the motions of the heavenly bodies in general. Each successive observation of astronomers constitutes a part of the inductive process; as does also the fact that Flamsteed, Mayer, and Le Monnier have pointed out stars, which are now not discoverable, in the very places where, according to calculation, Uranus would have been at the respective periods when their observations were made.

To attempt, however, a full illustration of the process of physical induction would be to explain the science, or at least the branch of science, from which the illustration should be borrowed. The

history of the discovery of the circulation of the blood; of gravitation; of the laws of light and motion; of the modern improvements in chemical, geological, and agricultural science, which may be found in particular treatises, or in a good Encyclopedia, will best serve to illustrate its nature.

Those who acquiesce in the preceding observations will feel a regret to find *Induction* classed among defective or informal syllogisms. In the text, the *minor* premiss is said to be understood; and the argument is considered reducible to this form: *A certain number of examined cases agree with a certain general law; all the cases belonging to the same species are virtually the same thing as that given number of examined cases: therefore all the cases belonging to the same species agree with that general law.* Or, to adopt the example adduced, *All the examined specimens of the species of iron ore called magnet have the property of attracting iron; but all existing specimens of that ore are (or may be deemed equivalent to) the aggregate of examined specimens; therefore all magnets have the property of attracting iron.* Others, more appropriately, contend that the *major* premiss is to be supplied, and that the syllogistic statement is as follows: *That property which belongs to every examined specimen of magnet belongs to the whole species; but the power of attracting iron is a property which belongs to every examined specimen of magnet; therefore the power of attracting iron belongs to the entire species of the magnet.* But, to allow the utmost, this represents only the final part of the process. The essence of the induction consists, first, in the accumulation of the individuals examined, so as to authorize the assertion contained in the *minor* premiss; and then, in the calculation of probabilities requisite to establish the *major* premiss.

The observation therefore of Aristotle, that induction is prior in its nature to syllogism, appears

to be correct. Nor can syllogistic reasoning be carried on to any extent without previous induction.

Yet this acknowledged dignity and value of induction has no tendency to degrade the syllogistic system. It does not afford any sufficient reason either for the omission of this branch of logic, or for the universal study of the inductive system. For though, theoretically, as before observed, no human testimony will authorize our admission of general principles; yet in fact the greater part of mankind must rely on testimony. We are compelled to act on the principle, (however incorrect it is in theory,) *cuique in sua arte credendum*. Few are competent to repeat the inductive process of a Harvey, a Galileo, or a Newton; or to follow a modern geologist in his researches over almost every part of the globe. Few are able even to peruse the history of the phenomena and experiments which others have recorded, and thus, taking their facts only for granted, to make the conclusions their own. The majority, even of literary and scientific men, must be contented, on most subjects, with a superficial knowledge; merely taking upon trust the general results, without any acquaintance with the train of observation and discovery on which they were originally founded. And the case is similar in respect to moral induction. Our own opportunities of observation are limited; we must continually rely, in practice, on the counsels and opinions of others on subjects of moral and political expediency.

And this necessity appears to be the true reason why the syllogistic system should be first and most generally understood. For while few have opportunities or powers to carry on an inductive process beyond the simple observation of those things which present themselves unsought to their notice, all have daily occasion to use that kind of reasoning

which depends on syllogistic principles. No step in common life can be taken without it. It is convenient indeed, if practicable, to obtain an acquaintance with the process by which general principles are acquired; as it is an advantage to the manufacturer to understand the nature and construction of his machinery. Yet if his machinery should be beyond his comprehension, he still finds by experience its utility, and carries on his work. To abolish or to lay aside the use of syllogism, for the sake of devoting every power to the advancement of inductive knowledge, would be not less absurd than if our manufacturers should cease from their beneficial occupations until they should succeed in bringing mechanism to the highest pitch of perfection.

3. *Exemplum*; (Aristoteli *Inductio Oratoria*;) ubi quod ponitur de singulari noto, assumitur de simili ignoto: ut, *Sylla et Marius laceravere rempublicam*; ergo *Cæsar et Pompeius lacerabunt*. Hujus etiam minor reticetur; quapropter (ut in cæteris) quæstionem *assumi* dico; neque enim *colligitur* nisi exposito et subintellecto.

Example differs from *Induction* chiefly in these two respects:

1. As to the *antecedent*; which in *Induction* must consist of the enumeration of *many* singular facts; whereas *Example* does not require more than *one*.

2. As to the *conclusion*; which in *Induction* is, either strictly or morally, *universal*; but in *Example* is *singular*.

The following are specimens of arguments from *Example*.

Hannibali imperatori parem consulem nominare decet. Hoc anno, ad Capuam, Jubellio Taureæ Campano summo equiti provocanti summus Romanus eques Asellus Claudius est oppositus. Adversus Gallum, quondam provocantem in ponte Anienis, T. Manlium, fidentem et animo et viribus, misère majores nostri. Ob eandem causam haud multis annis post fuisse non negaverim, cur M. Valerio non diffideretur, adversus similiter provocantem arma capienti Gallum ad certamen. Quemadmodum pedites equitesque optamus, ut validiores, si minus, ut pares hosti habeamus; ita duci hostium parem imperatorem quæramus. (Liv. ex Fabii oratione: xxiv. 8.)

In minore te experti, Otacili, re sumus. Haud sane, cur ad majora tibi fidamus, documentum quidquam dedisti. . . . Si te classem obtinente, etiam, veluti pacato mari, quælibet Hannibali tuta atque integra ab domo venerunt; si ora Italiæ infestior hoc anno, quam Africæ, fuit; quid dicere potes, cur te potissimum ducem Hannibali hosti opponant? (Liv. ib.)

Artabanus employs this kind of argument to dissuade Xerxes from his intended invasion of Greece. *Ἐγὼ Δαρείω ἠγόρευον μὴ στρατεύεσθαι ἐπὶ Σκύθας, . . . ὁ δὲ στρατευσάμενος, πολλούς τε καὶ ἀγαθούς τῆς στρατιῆς ἀποβαλὼν ἀπῆλθε. Σὺ δὲ, ὦ βασιλεῦ, μέλλεις ἐπ' ἀνδρας στρατεύεσθαι πολλὸν ἔτι ἀμείνονας ἢ Σκύθας. (Herod. vii. 10.)* Two or three other instances of this kind occur in the same speech.

Hermocrates, when announcing to the Syracusans the expected approach of the Athenian armament, argues in the same manner from the defeat of the Persian invaders of Greece (an individual fact already known) to the probable destruction of the invaders of Sicily. (*Thuc. vi. 33. Ὀλίγοι γὰρ . . . ζυμβῆναι.*)

Demosthenes thus introduces an apposite example: *Ἵπὲρ ἧς (χώρας) ὡς μὲν τοὺς ἐπιόνας ἐκείνων*

ἀμυνοῦμεθα, οἱ ἐν Μααθαῶνι τῶν πρόγονων αὐτοῦ μάλιστα ἀν εἰδεῖν. (Περὶ τῶν συμμορ.)

A correct and forcible instance of this mode of argument by analogy occurs in 1 Samuel xvii. 34—47. The *examples* also used by the Israelites in their lively remonstrance with the Reubenites, &c. (Josh. xxii. 17, 18, 20.) by the Jewish elders in behalf of Jeremiah, (Jer. xxvi. 17—19.) and by Gamaliel in behalf of the apostles, (Acts v. 36—39.) are very apposite and striking. The speech of Rabshakeh, recorded in Isaiah xxxvi. 18, 19, 20. presents a fallacious instance of the same. The conclusion in this case is not drawn *de simili*; there was no comparison between the omnipotent God of Israel and the idol-gods of the heathen.

This species of argument even when derived from real facts produces only a low degree of moral probability. But it comprehends also *similes*, and even *fables*, which, although really no more than illustrations, affect the unguarded mind as if they were arguments, and are therefore frequently substituted for proof by Rhetoricians. Thus the latter part of the first illustration from Livy (*Quemadmodum pedites, &c.*) is an *Example*; though of an inferior order to those contained in the preceding portion of that sentence. Thus Demosthenes: Ὁ μὲν γε (βασιλεὺς) χρυσίον, ὡς φασιν, ἄγει· τούτο δὲ ἀν διαδῶ, ζητήσει· καὶ γὰρ τὰς κρήνας, καὶ τὰ Φρέατα ἐπιλιπιῖν πέφυκεν, εἴαν τις ἀπ' αὐτῶν ἀθρόα καὶ πολλὰ λαμβάνῃ. (Περὶ συμμορ.)

Again, *He who voluntarily continues in ignorance, is guilty of all the crimes which ignorance produces; as to him who should extinguish the tapers of a lighthouse may justly be imputed the calamities of shipwreck.* (Dr. Johnson.)

4. *Sorites*; in cuius Antecedente, ex ordinatâ serie terminorum, præcedens quisque sub-

jicitur sequenti, donec a subjecto quæstionis pervenitur ad prædicatum, v. g. *Homo est animal: animal est vivens: vivens est substantia; ergo Homo est substantia.* In Sorite igitur subaudiuntur tot Syllogismi quot sunt intermediæ propositiones; (vel si mavis, quot in antecedente termini intermedii;) unde et a cumulo nomen habet.

In the following Epicurean Sorites, though some of the premises, and consequently the conclusion also, are false, the argument is formally correct. *Quoniam deos beatissimos esse constat; beatus autem esse sine virtute nemo potest; nec virtus sine ratione constare; nec ratio usquam inesse nisi in hominis figura; hominis esse specie deos confitendum est.* (Cic. de Nat. Deor. §. 18.) Which may be thus stated:

The gods are happy beings;

All happy beings are virtuous;

All virtuous beings are endued with reason:

All beings endued with reason bear the human form;

Therefore, The gods bear the human form.

The intermediate terms of the antecedent, and the intermediate propositions of the whole argument, are three. Consequently this Sorites is no more than a condensed expression of three categorical syllogisms: which may be thus displayed at length.

1. *All happy beings are virtuous; the gods are happy; therefore the gods are virtuous.*

2. *All virtuous beings are endued with reason; the gods are virtuous beings; therefore the gods are endued with reason.*

3. *All beings endued with reason bear the human form; the gods are endued with reason; therefore the gods bear the human form.*

In this analysis, the first two propositions of the Sorites, transposed, constitute the premises of the first syllogism. The conclusion from these premises forms the minor premiss of the second syllogism; the major premiss of which is the third proposition of the Sorites. The conclusion of this second syllogism forms the minor premiss of the third, while the major premiss consists of the fourth proposition of the Sorites, which is here the last of the antecedent. This is therefore the last syllogism, and its conclusion is the inference of the whole Sorites.

The Sorites may be analysed in another method, by taking the propositions of the antecedent in a retrograde order: thus;

1. *Whatever is endued with reason bears the human form; Every virtuous being is endued with reason; Therefore, every virtuous being bears the human form.*

2. *Every virtuous being bears the human form; Whatever is happy is virtuous; Therefore, whatever is happy bears the human form.*

3. *Whatever is happy bears the human form; The gods are happy; Therefore, the gods bear the human form.*

According to this method, the proposition last in order in the antecedent of the Sorites is the major premiss of the first syllogism; and the proposition immediately preceding the last, is its minor premiss. The conclusion of the first syllogism constitutes a second major premiss, to which the last proposition but two, of the Sorites, affords a minor premiss: and so on, till all the propositions of the Sorites are exhausted. The first proposition becomes the minor premiss of the last syllogism, the conclusion of which is the general inference of the Sorites.

The inspired author of the Epistle to the Romans more than once employs this mode of argument.

The Sorites in chap. viii. 29, 30, when reduced to form, and expressed in the most concise manner, will appear thus :

All the foreknown are predestinated :

All the predestinated are called :

All the called are justified :

All the justified are glorified ;

Therefore, All the foreknown are glorified.

Aristotle argues thus : Οὐκ ἂν, μὴ οὔσης ἀλλαγῆς, κοινωνία ἦν οὔτ' ἀλλαγῆ, ἰσότητος μὴ οὔσης· οὔτ' ἰσότης, μὴ οὔσης συμμετρίας. (Eth. Nic. v. 5.) That is ;

The preservation of society requires exchange ; Whatever requires exchange requires equitable valuation of property ; Whatever requires equitable valuation of property requires the adoption of a common measure : Therefore the preservation of society requires the adoption of a common measure.

The first and second propositions of this Sorites, when transposed, afford premises in Barbara, which prove the conclusion, *The preservation of society requires equitable valuation of property.* And this conclusion, with the third proposition in the Sorites, constitutes another antecedent in Barbara, whence is deduced the conclusion above drawn, viz. *The preservation of society requires the adoption of a common measure.*

Syllogismus ex propositionibus constat, propositiones ex verbis, verba notionum tesseræ sunt. Itaque si notiones ipsæ (id quod basis rei sunt) confusæ sint et temere a rebus abstractæ, nihil in iis quæ superstruuntur est firmitudinis. (Bac. Org. 14.) That is ; *Syllogisms are composed of propositions ; whatever is composed of propositions is composed of the constituent parts of propositions, namely, words ; that which is composed of words is composed of the symbols of notions ; that which is composed of the symbols of notions is composed of the symbols of things confused, and rashly abstracted ; whatsoever things are composed of such symbols must themselves be weak and unsound ;*

therefore syllogisms are weak and unsound. This argument is therefore a compression of four syllogisms in Barbara.

The two following rules are rendered obvious by the preceding analysis of the nature of a Sorites.

1. Its antecedent admits of no *negative* proposition except the *last*. For each of the other propositions must be either a minor premiss in the first figure; and therefore affirmative: or a major premiss of a syllogism of which the conclusion must be affirmative.

2. Its antecedent admits of no *particular* proposition except the *first*. For all the other propositions are successively major premises in the first figure, and therefore universal.

5. Soriti affinis est Syllogismus, cujus præmissarum altera est sententia Enthymematica; ut, *Nullus injustus est amandus: Omnis Tyrannus (crudelis cum sit) est injustus; ergo, Nullus Tyrannus est amandus.* Qui quidem Syllogismus peculiare nomen non habet; præmissæ autem Enthymematicæ antecedens, Aristoteli *Prosylogismus* est.

The *Prosylogism* is an appended proposition which is incidentally introduced to confirm one of the premises of the main argument. It forms the premiss of a distinct enthymem, of which the proposition to which it is adjoined is the conclusion. The syllogism thus combined with its prosyllogism is called an *Epichirema*.

The plan of Cicero's oration in defence of Milo is frequently adduced as a good instance of this

mode of reasoning. It is to this effect: *He who attempts to assassinate another, may be justly killed by the object of his murderous intentions: (for the laws of nature and of nations, and the conduct of good men, prove it lawful :) But Clodius attempted to assassinate another; (for he formed an ambuscade against him, and provided himself with armed soldiers :) Therefore Clodius was justly killed by the object of his murderous intentions.*

Ὀμοίωται δὲ ἡ πολιτικὴ ἀνδρεία μάλιστα τῇ ἀληθίνῃ, ὅτι δι' ἀρετὴν γίνεται δι' αἰδῶ γὰρ, καὶ διὰ καλοῦ ὀρεξίν, (τιμῆς γὰρ,) καὶ φυγὴν ὀνείδους, αἰσχροῦ ὄντος. (*Arist. Eth. Nic. iii. 8.*) This sentence contains a complex epichirema, comprehending three leading prosyllogisms, together with two others, subordinate to the former. The main argument consists of the enthymem, *Political fortitude is produced by virtue, and therefore bears most similarity to genuine fortitude.* To the expressed premiss, which is the minor, three prosyllogisms or enthymematic proofs are adjoined; δι' αἰδῶ γὰρ, διὰ καλοῦ ὀρεξίν, διὰ φυγὴν ὀνείδους. To the second of these is added a subordinate proof or prosyllogism, *τιμῆς γὰρ*: and to the third, another subordinate prosyllogism, *αἰσχροῦ ὄντος*.

Confidence in promises is essential to the intercourse of human life; because without it, the greatest part of our conduct would proceed upon chance. But there could be no confidence in promises, if men were not obliged to perform them; the obligation therefore to perform promises is essential to the same ends and in the same degree. (Paley.) This is a syllogism, stated at full length, and having a prosyllogism, (*because without it, &c.*) attached to the major premiss.

The publication of a libel is criminal: but the act of putting a libel into the post is an act of publication: (for the moment a man passes the libel from his hand, his control of it is gone :) that act therefore cannot but be pronounced criminal. (Lord Ellenborough.)

The following is an epichirema, or an enthymem

confirmed by a prosyllogism. *Syllogismus ad principia scientiarum non adhibetur, ad media axiomata frustra adhibetur, (cum sit subtilitati naturæ longe impar :) assensum itaque constringit, non res. (Bacon. Org. i. 13.)*

6. Huc denique revocandum est compendium illud disputandi opponentibus usitatissimum, reticendi scilicet conclusionem; cum sit ipsa quæstio, quam respondens non supponitur ignorare.

This practice of not making a precise statement of the conclusion at the close of every argument, is not confined to *opponents* in formal disputations; but is the natural habit of all who are discussing a subject in private conversation, in public deliberations, or in argumentative compositions. To act otherwise would frequently occasion needless tautology and waste of time.

Yet the habit of suppressing the conclusion affords a great facility to the use of fallacious arguments; especially in those branches of fallacy which are denominated *ignoratio elenchi*, or the proving something different from the real question; and *fallacia consequentis*, or the fictitious mode of reasoning generally called a *non-sequitur*.

For example; Let the question be put by a supposed enquirer; *Is it not wrong to bow down before images?* To which the instructor answers thus: *If it is not lawful for Catholics to bow down in their chapels, how comes it to be lawful for Protestants to bow down themselves when they enter their churches? Again, why do the Protestants let beggars bow down at their doors for a morsel of bread, their little children bow down for their parents' blessing, the poor bow down before the rich? And all the Protestants bow*

down before the Lord's supper ; and even to an empty chair when it is set for the king's throne in the parliament house. The argument is apparently an argumentum ad hominem ; thus ; Any practice maintained by our opponents may be assumed to be free from objection ; but bowing is a practice maintained by our opponents ; (as proved by an induction of particular instances ;) therefore bowing may be assumed to be free from objection. But this is not the conclusion required : the question does not refer to the objectionableness of bowing absolutely ; but to that of bowing before images.

It is therefore important that every hearer or reader should frequently recal to his mind the real question under discussion, and examine whether the arguments adduced apply to it, or to some other proposition which bears a resemblance to it.

A few examples (correct and incorrect) of all these modes of reasoning will be found at the close of the Appendix, in the second series of " Promiscuous Syllogisms."

CAP. IV.

DE SYLLOGISMIS HYPOTHETICIS.

§. 1. *De Syllogismis Conditionalibus.*

SYLLOGISMUS Hypotheticus est in quo una, duæ, vel tres propositiones hypotheticæ, v. g. *Si sapit, est beatus: Sapit; ergo est beatus.* Vel, *Qui sapit est beatus: Si est Philosophus, sapit; ergo Si est Philosophus, est beatus.* Vel, *Si sapit, est beatus: Si est Philosophus, sapit; ergo Si est Philosophus, est beatus.* Nos de eo tantum loqui instituimus qui est cæteris usitatior, in quo nempe Major Hypothesica.

Propositio Hypothesica late sumta definitur, Plures Categoriæ per conjunctionem aliquam unitæ; et conjunctio vocatur *Copula*; estque *Conditionalis, Disjunctiva, Causalis &c.* ut apud Grammaticos; unde totidem Hypothesicarum species, suis copulis cognomines. Sed ad Syllogismum non faciunt, præter *Conditionalem, et Disjunctivam*; quarum exempla, *Si sapit est beatus. Vel dies est vel nox.*

The definition here given of *hypothetical propositions* is by far too vague, and deviates from the common as well as the technical signification of that term. It in fact includes every kind of compound sentence. According to this definition the

following sentences would be hypothetical; for each of them is composed of two or more categorical propositions united by a conjunction or copula.

Solon was an Athenian [and] Lycurgus a Lacedemonian.

Man appears mean and worthless now, [but] a nobler state is in reserve for him.

The understanding sometimes rests on testimony, when testimony of right has nothing to do, [because] it is easier to believe than to be scientifically instructed.

The thing under proof is not capable of demonstration, [and therefore] must be submitted to the trial of probabilities.

[If] a man has for haste skipped over what he should have examined, he must begin and go over all again, [or else] he will never come to knowledge.

The light of knowledge is pure and bright, [unless] it be perverted and polluted by wickedness or imperfect instruction.

The definition of a hypothetical proposition which has been given in the second chapter, namely, *Quæ sub conditione enunciat*, (see pages 88 and 90,) is more accurate. This comprehends the two species of hypothetical sentences; namely, those in which the condition is expressed; and those in which it is implied. The former are called *conditional* propositions; as, *If restrictions are essential to security, they are not inconsistent with civil liberty.* The latter are *disjunctive* propositions; as, *Monarchies are either hereditary or elective. Either Metius or Galileo was the inventor of the telescope.*

Hypothetical syllogisms are accordingly either *conditional* or *disjunctive*.

1. *Conditional syllogisms* may consist of three conditional propositions: as,

If light is not refracted near the surface of the moon, it cannot experience any twilight;

But, if the moon has no atmosphere, light is not refracted near its surface :

If therefore the moon has no atmosphere, it cannot experience any twilight.

Others contain *two* conditional propositions ; namely, one of the premises and the conclusion : as,

None who neglect to fulfil their engagements can reasonably expect to maintain their credit :

But if a man does not pay his debts, he neglects to fulfil his engagements :

Therefore, if a man does not pay his debts, he cannot reasonably expect to maintain his credit.

But the species of conditional syllogism which is of most extensive use is that which consists of one conditional proposition followed by a categorical premiss and conclusion : as ;

If liberty has a tendency to degenerate into licentiousness, it requires to be restricted by judicious laws :

But liberty has a tendency to degenerate into licentiousness :

Therefore it requires to be restricted by judicious laws.

2. *Disjunctive syllogisms* admit only of the last of the above forms ; as

The affinities of natural substances must be ascertained either by syllogistic or by inductive process :

But those affinities cannot be ascertained by syllogism :

Therefore they must be ascertained by induction.

To denominate the hypothetical proposition in a syllogism, *the major premiss*, is inaccurate, and calculated to create confusion.

Conditionalis habet vim illativam. Unde *Conditio* ipsa, sive pars prior, quæ est instar

inferentis, *Antecedens* dici solet; *Assertio*, sive pars posterior, quæ rationem habet illatæ, *Consequens*; partiumque inter se connexio, *Consequentia*.

A conditional proposition does not affirm the truth of either of the categorical propositions of which it is composed; but merely states that there exists such a connexion between them that if the former of them, or the supposition, be granted, the latter must follow. And this connexion is called the *consequence*. (See p. 130, 131.) Thus the sentence, *If ab is equal to xy , then $\frac{a}{x}$ is equal to $\frac{y}{b}$* , involves no intimation of the truth or falsehood of the assertion, *ab is equal to xy* ; or if the assertion, *$\frac{a}{x}$ is equal to $\frac{y}{b}$* ; but, laying down the former as a *condition*, it then asserts that the latter would necessarily follow from that condition. From their relative situation in sense, and most frequently in arrangement, the former member of a conditional sentence is technically called the *antecedent*; the latter the *consequent*.

Condition or } *If the human soul is immaterial, ...*
Antecedent. }

Assertion or } *It is immortal.*
Consequent. }

Condition or } *If words have no natural meaning*
Antecedent. } *of their own,*

Assertion or } *They carry to the hearer whatever*
Consequent. } *sense he has been used to attach*
to them.

In the following sentence the consequent precedes the antecedent. *There could be no confidence in promises, if men were not obliged to perform them.*

The following propositions bear only the form of hypotheticals, because there is no *consequence*

or mutual dependence between their members. *If the sky should fall, we shall catch larks. If Mars and Jupiter are in opposition, bitter calamities will befall our country.*

Conditionalis cujusque sententia est, quod, datâ Conditione, datur Assertio; quod bifariam explicari potest. 1. *Si detur* Conditio, *danda est* Assertio; unde *Regula prima*: Positâ Antecedente, recte ponitur Consequens. 2. Si daretur Conditio, *danda esset* Assertio; unde *Regula secunda*: Sublatâ consequente, recte tollitur Antecedens.

Porro hoc unum statuit, Antecedente verâ, veram esse Consequentem; non autem ambas esse simul veras, aut simul falsas, aut una vera, falsam alteram: per illam igitur, sublatâ Antecedente, poni vel tolli potest consequens; aut positâ Consequenti, poni vel tolli potest Antecedens. Unde *Regula tertia*: Sublatâ Antecedente, vel Positâ Consequente, nihil certo colligitur.

Conditionalis igitur Syllogismi duæ sunt, nec plures, formulæ.

I. Quæ vocatur *Constructiva*.

Si C. D. tum K. Δ.

Sed C. D. ergo K. Δ.

II. Quæ dicitur *Destructiva*.

Si C. D. tum K. Δ.

Sed non K. Δ. ergo non C. D.

1. The very form of a *conditional proposition* implies that if the *condition* or *antecedent* be actually granted, the *assertion* or *consequent* must be admitted. Hence the first rule; *The antecedent being laid down as true, the truth of the consequent is legitimately inferred.*

The conditional syllogism founded on this principle is said to be of the *constructive* form.

If the practice excites discontent, it should be at once suppressed: But it does excite discontent; Therefore it should be suppressed.

If the moon is this day in its first quarter, it cannot be eclipsed; But it is this day in its first quarter; Therefore it cannot be eclipsed.

2. From the necessary connexion or *consequence* between the condition and the assertion in a correct conditional proposition, it is further evident, that, *supposing* the condition to be true, the assertion will then be *necessarily* true. If therefore it is ascertained that the assertion is *not* true, it must follow that the condition is *not* true. This principle gives occasion to the second rule: *The consequent being removed as false, the antecedent is also rightly removed.* The syllogism formed on this principle is said to be of the *destructive* form. Thus,

If words were not ambiguous, they would never have been the occasion of useless controversy: But they have repeatedly been the occasion of useless controversy: Therefore they are ambiguous.

If each man ought to have more wives than one, more than one would have been given to Adam: But not more than one was given to Adam: Therefore each man ought not to have more than one.

If they had been of us, they would have continued with us; but they went out, that they might be made manifest that they were not all of us. (1 John ii. 19.) that is, destructively; but they did not continue with us; therefore they were not of us.

If the inheritance be of the law it is no more of promise; but it was given to Abraham by promise; therefore it is not of the law. (Gal. iii. 18.)

3. The assertion of the consequent, or the denial of the antecedent, cannot authorize any conclusion. For the conditional proposition affirms only that *the given antecedent* must be attended by *the given consequent*. But it does not denote any limitation to the consequent; which *may attend the given antecedent*; but may also follow from some *other antecedent*. For instance:

If the mill has too copious a stream, it cannot work; but it has not too copious a stream; therefore

If the mill has too copious a stream, it cannot work; but the fact is that it cannot work; therefore

It cannot be inferred in the former instance that *the mill can work*; or in the latter instance, that *it has too copious a stream*; because the same consequent might follow from *a deficiency of water, a want of repair, or some other cause*.

The distinction between the *constructive* and the *destructive* form bears no relation to the quality of the conclusion. Affirmatives and negatives may be inferred by either method, as is shewn by the examples above given.

It is very frequent to express the conditional proposition alone; the sense, the connexion, or even the tone of the speaker, enables the reader or hearer to judge whether the constructive or the destructive argument be intended. For example:

If thou didst receive it, why dost thou glory? (1 Cor. iv. 7.) that is, constructively; If thou hast received every good thing thou possessest, thou hast no cause to glory in thyself: but thou hast received every good thing which thou possessest; therefore thou hast no cause to glory in thyself.

If this man were not of God he could do nothing:

that is, destructively ; but he has wrought this great miracle ; therefore he is of God.

If righteousness come by the law, then Christ is dead in vain.

If schisms be an evil, they who give unnecessary offence are as much to be blamed as they who take it : that is, constructively, but schisms are an evil, therefore, &c.

Neque enim bonitas, nec liberalitas, nec comitas esse potest, non plus quam amicitia, si hæc non per se expetantur, sed ad voluptatem utilitatemve referantur : that is, destructively ; si bonitas, &c. non sunt per se expetendæ, esse non possunt : sed sunt bonitas, liberalitas, &c. ; ergo, per se sunt expetendæ.

Si utilitas firmâ corporis constitutione ejusque constitutionis spe exploratâ continetur ; certe hæc utilitas cum honestate pugnabit. The argument implied is, Sed hoc fieri nequit, ergo nec illud.

When the argument is expressed, it is usually for the purpose of appending a prosyllogism to the categorical premiss : as,

If there be no resurrection of the dead, then is Christ not risen ; but our blessed Lord is risen ; (for this is a fact established by the testimony of the most pure and credible witnesses ;) therefore there is a resurrection from the dead.

If the earth be a plane, some edge or boundary must be discoverable : but no such edge or boundary is discoverable ; (for all who have persevered in sailing continually in the same direction have returned to the longitude from which they set out without making any such discovery ;) Therefore the earth cannot be a plane.

Conditional syllogisms are sometimes accumulated in the form of the *Sorites*. Thus, the Apostle's ar-

gument in 1 Cor. xv. 13—19, when reduced to form, will stand as follows:

If the dead rise not, then is not Christ raised; and if Christ be not raised, our faith is vain. If our faith is vain, our hope is confined to this life; but if in this life only we have hope in Christ, we are of all men most miserable. The immediate inference is, If the dead rise not, believers in Christ are of all men most miserable; and the implied argument is; But they are not of all men most miserable, (being alone possessed of true peace and happiness,) therefore the dead will rise: or more fully thus; therefore our hope is not confined to this life,—our faith is not vain,—Christ is risen,—and the dead will rise.

Again; *Si hoc natura præscribit, ut homo homini, quicunque sit, ob eam ipsam causam quod is homo sit, consultum velit, necesse est secundum eandem naturam omnium utilitatem esse communem. Quod si ita est, und continemur omnes et eddem lege naturæ: idque ipsum si ita est, certe violare alterum naturæ lege prohibemur. Verum autem primum, verum igitur extremum. (Cic. Off. iii. 6.)*

The mathematical argument *ad impossibile* is a destructive hypothetical syllogism, usually founded on a premiss deduced from a conditional Sorites. For instance;

If a straight line drawn at right angles to the diameter of a circle at its extremity does not fall without the circle, it falls within it; if it falls within it, it may be produced till it meets the circumference; if so, a straight line from the centre to the point of meeting is equal to the semidiameter between the centre and the extremity from which the line was drawn at right angles; if so, the two lines from the centre, with the line at the extremity of the diameter, form an isosceles triangle; if they form an isosceles triangle, the angles subtended by the equal sides are equal: if equal, they are both right angles: if this be the case, two angles of a triangle are equal to two right angles: There-

fore, if a straight line drawn at right angles to the diameter of a circle at its extremity does not fall without the circle, it occasions the existence of a triangle containing two angles equal to two right angles; but nothing can occasion this; therefore such a line must fall without the circle. (Euc. El. iii. 16.)

Every correct conditional syllogism may be reduced to an equivalent categorical syllogism.

Those which consist of one conditional and two categorical propositions are reduced to the form of regular enthymems by the removal of the hypothetical premiss. Thus;

If the knowledge of truth is desirable, it should be sought with perseverance.

But the knowledge of truth is desirable:

Therefore it should be sought with perseverance.

If the introductory premiss be omitted, there remains this enthymem:

The knowledge of truth is desirable;

Therefore it should be sought with perseverance.

And by supplying the major premiss, *Whatever is desirable should be sought with perseverance*, a pure categorical syllogism is produced.

Again,

If no mammiferous animals are properly called fishes, then whales are not properly called fishes;

But no mammiferous animals are properly called fishes; Therefore whales are not properly so called.

Omitting the conditional premiss, the two remaining propositions constitute an enthymem; and to complete the syllogism, it is requisite only to supply the *minor* premiss; thus;

No mammiferous animals are properly called fishes:

Whales are mammiferous animals; therefore

Whales are not properly called fishes.

In the other two forms of conditional syllogisms the propositions may always be converted into equivalent categorical propositions. For example:

If absolute monarchs had no object in view but the prosperity of their subjects, their sway would be unobjectionable :

If all men were what they ought to be, absolute monarchs would have no object in view but the prosperity of their subjects :

Therefore, if all men were what they ought to be, the sway of absolute monarchs would be unobjectionable.

Which may be thus categorically stated :

That which would occasion absolute monarchs to have no other object in view but the welfare of their subjects, would occasion that the sway of such monarchs would not be objectionable :

The state in which all men should be what they ought to be would occasion absolute monarchs to have no other object in view than the welfare of their subjects :

Therefore that state in which all men should be what they ought to be would occasion that the sway of absolute monarchs should not be objectionable.

A conditional syllogism is incorrect, unless its terms may be strictly reduced to three. For instance; *If Livy is a faithful historian, we may rely on the facts which he relates; but he is a faithful historian; (for so he was esteemed by his contemporaries, who were best able to detect misrepresentations, and no doubt would have so done, had he afforded them an opportunity;)* therefore we may rely on the facts which he records. That is, *If the facts recorded by Livy are recorded by a faithful historian, they demand to be believed, &c.*

If Livy is to be believed, the Romans experienced a signal defeat at Cannæ; but he is to be believed; therefore they did experience that defeat. That is, If that which depends on the testimony of Livy be true, it is true that the Romans were defeated at Cannæ, &c. In which there are three terms only.

If Titus was a virtuous and patriotic emperor, his subjects must have been happy; but such he was; it may therefore be inferred that they were happy. That is; The subjects of a virtuous and patriotic emperor are happy; the subjects of Titus were subjects of a virtuous and patriotic emperor; therefore, the subjects of Titus were happy.

§. 2. *De Syllogismis Disjunctivis.*

QUÆ de *Conditionali* dicta sunt *Disjunctivæ* satis cavent. Ejus enim in Syllogismo positæ sententia conditionaliter efferi semper potest.

V. g. Si, positâ vel C vel D, subsumatur

1. Sed C, ergo non D:
2. D, non C:
3. non C, ergo D:
4. non D, C:

Pro expositâ Disjunctivâ dic conditionaliter,

1. Si C, tum non D:
2. D, non C:
3. non C, tum D:
4. non D, C:

Disjunctive propositions are compound sentences connected by disjunctive particles.

Disjunctive hypothetical propositions are compound sentences connected by disjunctive particles employed not distributively but exclusively.

The following sentences are *disjunctive* but *not*

hypothetical, because the disjunctive member in each is distributive :

Studies serve for delight, for ornament, or for ability ; that is, some studies serve for one of these purposes and some for another of them.

Botanical arrangements are either natural or artificial ; that is, some are natural, and some artificial,

But in the following examples the disjunctive particles are exclusive, so that the admission of one alternative implies the denial of the others. They are therefore *disjunctive hypothetical* propositions.

The botanical arrangement of Linnæus is either natural or artificial.

Either Ceres or Juno is the smallest discovered planet of our system.

Caloric is either a very subtle fluid substance, or else a vibratory affection of the particles of bodies.

Disjunctive syllogisms are those in which a disjunctive proposition is followed by an enthymem which by affirming one branch of the disjunctive member denies the other, or by denying one branch affirms the other. It accordingly admits of four forms : as,

1. *Caloric is either a substance or a quality :
But it is a substance :
Therefore it is not a quality.*
2. *Caloric is either a substance or a quality :
But it is a quality :
Therefore it is not a substance.*
3. *Caloric is either a substance or a quality :
But it is not a substance :
Therefore it is a quality.*
4. *Caloric is either a substance or a quality :
But it is not a quality :
Therefore it is a substance.*

It is easy to reduce these to conditional syllogisms,

by altering the form of the hypothetical premiss. According to the directions in the text the disjunctive proposition in the first of the above forms may be thus expressed conditionally: *If caloric is a substance, it is not a quality.*

In the second form: *If caloric is a quality, it is not a substance.*

In the third form: *If caloric is not a substance, it is a quality.*

In the fourth form: *If caloric is not a quality, it is a substance.*

By this change *constructive conditional syllogisms* are produced. And if the conditional premises above appropriated to the first two forms, or those appropriated to the third and fourth forms, be respectively transposed, the conditional syllogisms will be of the *destructive kind*.

But there is very little utility in this process. It may be more useful to observe that *disjunctive syllogisms* are reduced to *categorical syllogisms*, by removing the disjunctive premiss and completing the remaining enthymem: as,

1. *No substance is a quality; heat is a substance: therefore it is not a quality.*

2. *No substance is a quality: heat is a quality: therefore heat is not a substance.*

3. *Every thing immaterial (every not-substance) is quality; heat is immaterial; therefore heat is a quality.*

4. *Whatever is not a quality is substance; heat is not a quality; therefore heat is a substance.*

Disjunctive syllogisms generally have the categorical premiss confirmed by a prosyllogism: as,

Virtues are either faculties, passions, or habits: But they are not faculties or passions: (for brutes, which cannot be virtuous, possess both:) Therefore they are habits.

The same argument may be expressed *conditionally*, by substituting for the disjunctive premiss

either of the following : *If virtues are not faculties or passions, they are habits ; or, If virtues are not habits, they must be either faculties or passions.*

It may also be expressed *categorically* by substituting the following in the place of the hypothetical premiss : *Those qualities of the soul which are neither faculties nor passions must be habits.*

All regal governments must be either hereditary or elective ; and as I believe there is no instance wherein the crown of England has ever been asserted to be elective, except by the regicides at the infamous and unparalleled trial of King Charles the First, it must of consequence be hereditary. (Blackst. Comm. v. 1. b. i. ch. 3.)

Here the introductory proposition is the major premiss of a categorical syllogism in Barbara, of which the disjunctive member constitutes the major extreme ; namely, *All regal governments are either-hereditary-or-elective ; the English government is a regal government ; therefore the English government is either hereditary or elective :* on which conclusion is founded the subsequent *disjunctive* syllogism ; *But it is not elective, therefore it is hereditary.*

§. 3. *De Dilemmate.*

SUPEREST Syllogismus quidam Hypotheticus redundans, alio nomine *Dilemma*, quia plerumque duo (etsi interdum plura) proponit adversario capienda; quorum utrumvis acceperit, causâ cadet. Tale est illud Biantis, *Si uxorem ducas formosam, habebis κοινήν, communem ; si deformem, ποιήν, pœnam :* ergo *Nulla est ducenda.*

Hoc non valet, nisi ita comparetur, ut partem alteram accipi sit necesse; utraque autem feriat; nec possit retorqueri. Quæ si vidisset Bias, suo sibi Dilemmate minus placuisset; neque enim vel formosa uxor vel deformis necessario futura est: sed est media quædam pulchritudo, quam Ennius *statam* appellavit; Favorinus eleganter *uxoriam*. Porro, nec formosa omnis est communis, nec deformis, pœna. Denique Dilemma facile retorqueri potest. Puta, *Si formosam duxero, non habebo pœnam; si deformem, non habebo communem.*

Dilemma nihil aliud est, quam *Inductio Negativa*; in quâ syllogismi Major conditionalis est cum consequente distributivâ; puta, *Si omnino, tum sic, vel sic, vel sic*: quam afferre categorice adeo est proclive ut non indigeat præcepto.

A *Dilemma* is a hypothetical syllogism of the destructive form; in which the hypothetical premiss consists of a conditional antecedent followed by a distributive or disjunctive consequent.

Its hypothetical premiss is therefore at once conditional and disjunctive. Thus the proposition, *If perfect virtue exists, it is to be discovered among men*, is conditional: the proposition, *Perfect virtue is to be discovered amongst either the civilized or the uncivilized*, is disjunctive: but the proposition, *If perfect virtue exists, it is to be discovered either in the civilized or the savage state*, is compounded of the conditional

and the disjunctive, and affords the basis of the dilemma, *But it is not to be discovered in either of these states; therefore it does not exist.*

But the dilemma further requires that the denial of each branch of the consequent be separately confirmed by a prosyllogism. Thus; *If perfect virtue exists, it exists either among civilized or among uncivilized communities. But among the latter it is not discoverable; for all the actions of savages are regulated by that narrow self-love which induces each to gain his own ends by cruelty and injustice. Nor is there a much nearer approach to it among civilized communities; for the improvements of civilization produce only a spurious kind of virtue, which owns no better motive than mere expediency. Therefore perfect virtue is a thing which does not exist.*

The name implies that the members of the disjunctive consequent should be only two. It is however applied without limitation to any number of alternatives.

These observations, together with the rules laid down for hypothetical arguments in general, will sufficiently illustrate the *form* of the dilemma. The rules which relate to the *matter* of the dilemma are chiefly the three following.

1. A dilemma must be so framed that *one alternative must be admitted.* This is its *first* fundamental rule. Thus it is insufficient to say, *All companions are either profitable or pernicious.* It is also inaccurate to reason thus; *If you change your course of life, you must either be influenced by your own judgment, which is in such cases peculiarly liable to be biassed by passion or prejudice: or you must be blindly led by some indifferent or interested person, who consults his own advantage while professing to seek yours, or who to save himself the trouble of thinking gives his advice at random.* In

both these instances a third alternative may be adduced. *Companions may be simply not injurious though not profitable. A change may be recommended by thoughtful and experienced advisers, deeply interested in your welfare.*

2. The second rule of a dilemma is, that *each alternative must exactly apply.* The following is therefore inaccurate. *If you study metaphysics, you must either follow implicitly the sentiments of some writer on the subject; and then you merely take things upon trust: or else you must trace the workings of your own mind; and then you will involve yourself in inextricable confusion.* The second alternative does not strike home, or compel assent. A man may trace for himself the workings of his own mind, without involving himself in inextricable confusion.

3. A dilemma ought to be incapable of being retorted. This is its third fundamental rule. Thus Aristotle represents an Athenian mother as endeavouring to dissuade her son from taking a part in public business by this dilemma, *Μὴ δημηγορῆς· εἰάν μὲν γὰρ τὰ δίκαια λέγῃς, οἱ ἄνθρωποι σε μισήσουσιν· εἰάν δὲ τὰ ἄδικα, οἱ θεοί.* To which, he observes, the young man might answer by the following retort; *Δεῖ μὲν οὖν δημηγορεῖν· εἰάν μὲν γὰρ τὰ δίκαια λέγω, οἱ θεοί με φιλήσουσιν· εἰάν δὲ τὰ ἄδικα, οἱ ἄνθρωποι.*

The nature of these rules proves that it requires a considerable degree of ingenuity to frame a dilemma which shall be altogether unexceptionable.

The following are instances of the *Dilemma.*

Si gravis sit dolor, brevis erit; si longus, levis; ergo fortiter ferendus. (Epicurean argument in *Cic. Fin. i. 12. and ii. 7.*) That is, *If any pain is intolerable or allows of impatience, it must be either severe or protracted pain which is so; but severe pain does not authorize impatience, (for it is but transient;) nor does protracted pain authorize impatience, (for protracted*

pain is not violent, but slight;) therefore no pain authorizes impatience; that is, all pain should be borne with fortitude.

Ἄλλ' ἐγὼ θαυμάζω πότερα ὡς κρατῶν βασιλεὺς αἰτεῖ τὰ ὄπλα, ἢ ὡς διὰ φιλίαν καὶ δῶρα. Εἰ μὲν γὰρ ὡς κρατῶν, τί δεῖ αὐτὸν αἰτεῖν, ἀλλ' οὐ λαβεῖν ἐλθόντα; εἰ δὲ πείσας βούλεται λαβεῖν, λεγέτω τί ἔσται τοῖς στρατιώταις, ἐὰν αὐτῶ ταῦτα χαρίσωνται. (Xen. Anab. ii. 1, 8.)

Οὐ μὴ παραδώσομεν τὰ ὄπλα· ἡμεῖς γὰρ οἴομεθα, εἰ μὲν θεοὶ βασιλεῖ φίλους εἶναι, πλείονος ἂν ἄξιοι εἶναι φίλοι, ἔχοντες τὰ ὄπλα, ἢ παραδόντες ἄλλω· εἰ δὲ θεοὶ πολεμεῖν, ἀμεινον ἂν πολεμεῖν ἔχοντες τὰ ὄπλα, ἢ ἄλλω παραδόντες. (Anab. ii. 1, 14.)

Tum Cæsar, si quod difficilius est id tibi reliquit Antonius, est nobis, inquit, causa cur te audire cupiamus: sin, quod facilius, tibi causa non est cur recuses. (Cic. de Oratore 2. fin.)

Did they believe what they then asserted? If they did not, they had imposed on the public; and if they did, the public ought never again to listen to such men.

Legatos decernitis? si ut deprecentur, contemnet: si ut imperetis, non audiet. (Cic. in Anton.)

Whoever contends that public discussion is not the best instructor in political transactions is either foolish, or else biassed by some private interest. He is foolish, if he thinks it possible by any other method to form a judgment of that which is still future and involved in obscurity: and he is under the influence of interested motives, if, while he wishes to persuade to some dishonourable measure, he feels himself incompetent to speak persuasively in support of that measure, but hopes by bold accusation to strike alarm both into his opponents and into his audience. (Thucyd. iii. 42.)

An unholy minister is the greatest of all sinners; for either he is a person of more than ordinary knowledge, or he is not. If not, he sinned greatly in undertaking that office, for which so great knowledge is requisite: If he be, his knowledge doubtless increaseth his guilt. (Bp. Bull.)

CAP. V.

DE SYLLOGISMO QUOAD MATERIAM.

§. 1. et 2. *De Opinione.*

§. 1. HÆC de Syllogismo quoad *Formam* spectato. Jam de eodem quoad *Materiam*, h. e. *Certitudinem* et *Evidentiam* propositionum ex quibus componitur.

Certa autem propositio est, cui nihil occurrit in contrarium, vel quod occurrit instar nihili est; ut, *Omnis homo est risibilis: Evidens*, quæ simul ac percipitur assensum imperat; ut, *Totum est majus suâ parte: Dubia*, in quâ hæremus, cum illius pars utraque valde se probet intellectui; ut, *Astra regunt homines*; nam et regere et non regere videntur.

Dubitanti siquid aliud occurrat, quo pendens animus in alterutram partem propendeat, quod erat *Dubium* fit *Probabile*. Et potest, quod probatur, *Verum* esse, sed probanti tantum *Verisimile* est. Multis nihilominus assentimur isto modo, et assensui nomen est *Opinio*.

Est igitur *Opinio* propositionis *tantum probabilis*; eique nulla competit certitudo; sed in ipsâ sui ratione includit *formidinem oppositi*. Sunt Opinioni tamen *Gradus* quidam *ad certitudinem*, pro diverso pondere rationum quæ

assensum movent, diversi. Est quod omnibus, quod plerisque, quod sapientibus videtur; et quod horum singulis, quod plerisque, quod celeberrimis: quorum omnium dispar est probabilitas; quorumdam vero tanta, ut ad certitudinem quam proxime accedat.

§. 2. QUI *Opinionem* (h. e. assensum quemlibet scientiâ minorem) parit, Syllogismus appellatur *Dialecticus*, Διαλεκτικός, i. e. probabiliter disserens: quæque proprie dicitur *Dialectica*, est pars Logicæ quæ de hoc agit Syllogismo. Multiplex autem est materia circa quam versatur opinio, et per omnes sparsa disciplinas: cujus infinitam pene varietatem ad pauca capita revocavit Aristoteles, et sub iis Effata Dialectica suis quasi in sedibus locavit. Hæc itaque capita Τόποις, i. e. *Locos* appellat; unde Syllogismus Dialecticus alio nomine *Topicus* dicitur.

De Locis Dialecticis et ad ea pertinentibus Effatis, sive (ut Scholastici vocant) Maximis, plura non loquor. Pro exemplo tamen hoc accipe: Inter Maximas Loci primi, qui est *Testimonium*, reperitur hæc; *Peritis credendum est in suâ arte*: ex quâ elicitur hujusmodi Syllogismus Topicus. *Quod* (Pythagoras) *Ipse dixit concedendum est*: *Migrare animas Ipse dixit*; ergo *Migrare animas concedendum*

est. Probatur Major; quia Peritis credendum est in suâ arte.

Opinion, or Belief, is founded on Probability. That is really probable which is veri simile; that is, which bears a greater resemblance to truth than its contrary does. That is apparently or relatively probable, in which there appears or is supposed to exist a resemblance to truth. Actual or objective probability exists in those things in which there is no uniform or necessary cause or antecedent, but which occur ὡς ἐπὶ τὸ πᾶν, having (to speak metaphorically) a certain bias more or less strong to one of two or more different results. Thus, if a die has on each face a different number, the throwing any certain number in preference to another is neither probable nor improbable, but indifferent. But if it be marked on three sides with one, on two sides with two, and on the remaining side with three, there is an actual probability that the trois will be least frequently, and the ace most frequently thrown. On the other hand, the sanguine purchaser of a lottery ticket bearing a favourite number thinks there is a great probability of obtaining a large prize; whereas the actual probability is exactly the reverse. And if he has formerly obtained a large prize by a ticket of the same number, the relative probability, that is, his fancy or imagination as to the chance of the same result a second time, may perhaps be increased in the same ratio in which its actual or absolute probability is diminished.

There are an infinite number of degrees both in real and in apparent probability. And a similar variety exists in the strength of the opinion or belief produced by them. The lowest degree is suspicion, doubt, hesitation, uncertainty. The highest degree amounts to moral certainty. For every thing, which

is not strictly demonstrable is, philosophically speaking, classed among probabilities.

It is a *slight* degree of probability which induces a person to hope for a fine day to-morrow, because it is fine to-day; or which regulates the compilers of almanacks in their weekly conjectures concerning the weather. It is a *higher* degree of probability which would lead a man to infer from the character of popery that the public worship of English protestants at Rome would not be long allowed. A *further advance* in the scale of probability is made if public report represents the English Church there as actually closed. But the probability is received as a *certainty*, when a credible friend upon the spot communicates by letter the fact of its suppression.

The proofs on which opinion or belief is founded may be either *direct* or *indirect*.

1. The *direct* foundations of assent to any thing as probable, are personal *observation* and *experience*. The rustic acts on this kind of probability when he applies a herb to stanch the blood from a wound, or to reduce a swelling, because, having found it beneficial on former occasions, he expects it to be again attended with the same result. On the same principle is founded the general expectation that *the sun will rise to-morrow*; that *summer will succeed the spring*; that *April will be showery and August hot*; that *the parent will be angry when his child runs heedlessly into danger or mischief*. Under the influence of this species of probability, although of a degree approaching much more nearly to demonstration, the philosopher without hesitation deduces an universal conclusion from an accumulation of particular observations and experiments which have uniformly brought him to the same point. - All inductions (except those which enumerate every indi-

vidual) depend on analogy, which is a species of probable or presumptive evidence.

2. The mind is influenced by *indirect* proof to acquiesce in the probability of any thing, when it infers that probability by the help of some principles already received as probable.

The most frequent and almost universal *indirect* proof of probability is *testimony*. This is the only mode by which it is possible to ascertain the probability or truth of *facts* which have not fallen under our own observation. And as to *principles* and *general conclusions*, although testimony is not the legitimate method of attaining them, yet in consequence of the shortness of life, the imperfection of our faculties, the want of opportunity, and the paramount importance of other pursuits, it is necessary, in most cases, to be satisfied with this evidence, and to rely on the fallacious maxim, *Cuique in sua arte credendum*. Even the philosopher must often, in his own science, rely on the testimony of others; or else he will occupy his time in retracing the steps which they have previously trodden, instead of proceeding from the points to which they had attained, and thus advancing science. The student will also in many cases find it expedient to adopt some general principles in a hypothetical manner, as probabilities resting on the simple testimony of his instructor, with the purpose of subsequently submitting them to the strictest test of proof or demonstration which the subject will admit.

Those general principles, indeed, which are thus received from the evidence of others, ought not to be so admitted as if they depended on the *authority*, the *ipse dixit* of those from whom they were received; that is, as if the fact, that such was their *opinion*, were sufficient evidence of the correctness of the principle: but simply as a matter of testi-

mony, that a moral or demonstrative certainty has been philosophically acquired by them. Thus we do not believe the laws of gravitation because certain philosophers have asserted or held them; but because we have strong probable evidence of the historical fact, that they have proved them by an attentive and laborious induction.

The probability of facts depends on the credibility of the testimony on which they rest. The chief qualifications which render a witness credible are these :

1. That he has been an eye-witness, or has had other satisfactory means of decidedly knowing the facts.

2. That he possesses good sense and sound judgment; that he is free from a fanciful imagination, superstitious feelings, &c; and that he has that kind of knowledge which will enable him to comprehend the nature of the fact.

3. That he is a person of habitual veracity; which we may judge to have been the case if he has obtained credit among his cotemporaries, his own country and neighbourhood, his immediate successors, &c.

4. That he is free from any bias of interest or prejudice. If the testimony is opposed to his previous opinions or habits of thinking, and inconsistent with personal interest, the probability of the fact is confirmed; and still more so if the same testimony is persevered in, although dishonour, loss, pain, or death be the manifest consequence.

5. That he maintains a consistency in all the parts of his testimony; for real inconsistencies afford positive proof that some part of the testimony is inaccurate, and a suspicion that the whole may be so. Yet *apparent* inconsistencies should be well examined; for circumstances may separately appear opposite which in connexion with a series of events are not really so. A coincidence in the sub-

ordinate parts and minutiae of a narrative helps much to establish the probability of it. An apparent variance between circumstances which on close examination appear compatible, affords also a very strong confirmation to the credibility of the witness: such particulars being out of the probable reach of collusion.

If a witness in whom these qualifications exist is confirmed in his declarations by the concurrent testimony of other unbiassed and independent witnesses; if his personal enemies, or those unfriendly to the disclosure of the facts or interested in the suppression of them corroborate his testimony; if his testimony is made public and yet not disproved or denied; all these and similar circumstances, added to the former, raise the probability to the highest degree, and entitle it to the denomination of certainty.

§. 3. *De Certitudine et Evidentiâ.*

CERTITUDO eadem videtur, quæ improprie vulgo dicitur *Evidentia Moralis*; quæque iis convenit effatis, de quibus nemo prudens dubitaverit: qualia præsertim sunt *Principia* ad vitam moresque pertinentia, cum conclusionibus quæ ab his legitime deducuntur. Nam hujusmodi propositiones videntur esse plusquam probabiles, nondum tamen evidentes: neque enim eas quisque amplectitur quamprimum apprehendit; sed iis prudens sine ullâ formidine assentitur.

Certitudo duplex est; alia *Objecti*, quæ est rei percipiendæ; alia *Subjecti*, quæ est intel-

lectûs percipientis. Et utrique sui sunt *gradus*. Est enim *Certius* certitudine Objecti, id cui minus obest; certitudine Subjecti, cui quod obsit minus percipitur.

Certainty, as here described, is comprehended in the term *probability* taken in the extended sense in which it has been used in the preceding observations; and is the medium between that which is commonly called by the name of probability on the one hand, and demonstration on the other. It is that highest degree of probability (in the philosophic sense) which none can doubt without folly or obstinacy: and therefore has the same practical influence as demonstration.

Physical and inductive conclusions are certain, not evident: deduced by analogy, not by demonstration. Yet men act with as much confidence on the principle, *that the harvest moon will occur at such a season, or, that water will rise to the level of its source; or that the promise of a man of veracity may be safely relied on;* as on the demonstrable facts that *the opposite angles formed by the intersection of two straight lines are equal, or that the radius of a circle, the chord of sixty degrees, and the tangent of forty-five degrees are equal to one another.*

The probability educed from satisfactory testimony also produces certainty. We are certain of the main facts related by Livy, abating only the casual frailties and errors to which the most accurate and judicious are liable, and the relation of prodigies in which the superstition of his age led him to place credit. Nor do a few circumstantial discrepancies between him and Polybius authorize us to mistrust either, as to the main facts which they relate. The authenticity and inspiration of each book of the holy Scripture depend on a train of probable proofs, which when combined amount

to absolute certainty. The great and fundamental fact of Christianity, the resurrection of our blessed Lord, is not strictly speaking *demonstrated*, (for to demonstrate a past event is a contradiction in terms;) but it is established by such an accumulation of testimony as amounts to the strongest possible certainty.

The term *certainty* is employed both *objectively* and *subjectively*. *Objective certainty* relates to the thing which is presented to the understanding and judgment. *Subjective certainty* denotes the impression made on the mind: namely, that state of mind in which it feels free from doubt on any subject. And when thus applied it expresses the effect of intuitive or demonstrative as well as of probable evidence.

The mind often *feels* certain of that which actually is *not* certain. The influence of early associations, the authority of eminent men, the opinions of our ancestors, general consent, the lively manner in which a subject has been first brought before the judgment, too great haste and too little cautious examination in coming to a decision, as well as other causes, occasion this error of judgment.

Besides the mode of producing certainty already mentioned, (namely, by shewing the highest degree of probability,) it may be occasioned by consciousness; as a man is certain that he *thinks, hopes, loves, &c.* and lastly, by immediate revelation from God; as the facts and doctrines of holy Scripture.

Evidentia similiter duplex est; *Objecti* nempe, et *Subjecti*; et utrique sui sunt *gradus*. Dispar enim evidentia est, prout id quod percipitur vel est sponte perspicuum; vel a sponte perspicuo propius abest; vel utrumvis horum videtur.

Atque hinc, rursus, *Evidentia* multifariam dividitur. Sed nostro sufficit instituto, quod hæc, de quâ loquimur, Propositionis *Evidentia*, vel est 1. *Axiomatis* sponte perspicui; cui proinde sine ullâ probatione assentimur: vel 2. *Conclusionis* ab ejusmodi axiomatibus (*immediate* an *mediate* parum refert, modo) rite deductæ. Nam cum una sit Veritas, sibi constans, apteque cohærens; quodque verum, vel per se certum atque evidens sit, vel cum effatis quibusdam certis et evidentibus necessario connexum; fit, ut quamprimum apprehenditur hæc connexio, eâdem omnia quasi luce perfusa, parem (specie) consequantur assensum.

Objective evidence in the *primary* degree is a relation between any two things, so necessary and obvious, that their agreement or disagreement cannot but be allowed as soon as perceived: such are those primary axioms, the knowledge of which is acquired from so early a process of induction, in minds unconscious of their own operations, that they are often deemed intuitive; and which neither require nor admit syllogistic proof: as, *Things which are double of the same are equal to one another*. In the *secondary* degree, it denotes the certainty of those relations which may be immediately deduced from these primary axioms: as, *The square on the hypotenuse of a right-angle-triangle is shewn to be equal to the sum of the squares on the sides, because each of these is double of certain triangles which are equal to one another*.

Subjective evidence is the full and accurate discernment of these relations.

Many things are supposed to be objectively evi-

dent which are not so. Thus the principle, *Vox populi vox Dei*, though wholly erroneous, has been often taken as a foundation of argument supposed to be demonstrative.

§. 4. *De Scientia.*

QUI postremæ huic evidentiæ competit assensus apud Logicos vocatur *Scientia*. Est igitur *Scientia conclusionis certæ et evidentis*, a præmissis certis et evidentibus legitime deductæ. Certitudinem vero utramque intelligo; et utramque (tam Objecti scilicet quam Subjecti) evidentiam. Nam per Objecti certitudinem *Scientia* distinguitur ab *Errore*; per Subjecti certitudinem ab *Opinione*. Si desit evidentiæ subjecti, nulla est *Scientia*; ubi sola adest, *persuasa* tantum, non *realis* evidentiæ est.

Qui *Scientiam* parit Syllogismus appellatur *Scientificus*; alio nomine, Ἀποδεικτικὸς *Demonstrativus*, et interdum *Demonstratio*. Conclusiones enim certas et evidentes apud Mathematicos reperiri multas in confesso est: cumque illi, quæ docent, soleant adjuncto *Diagrammate* ostendere; seque propterea non rem probare, sed (quod majorem innuit Evidentiæ) *Demonstrare* dicant; arcessito igitur ab illis vocabulo, *Syllogismus scire faciens* apud Logicos vocatur *Demonstratio*. Cumque in

Scientiâ (siqua forte possibilitas, tamen) nullus sit erroris metus; quod hujusmodi Syllogismis, sive uno, sive pluribus probatur, id libenter agnoscimus sicut perhibetur *ita esse*; et *aliter* (saltem naturaliter) *se habere non posse*.

Demonstration consists of a syllogistic argument, or series of arguments, in which a conclusion is necessarily and evidently inferred, either immediately, or, by the intervention of intermediate truths, from axiomatic and primary principles.

It produces *knowledge*, that is, a clear perception of and full acquiescence in the thing demonstrated. This perception and acquiescence may continue when the demonstrative process in which it originated is forgotten.

Demonstrative knowledge is *theoretically* superior to that acquiescence which is called *certainty*, and which proceeds from the highest class of probable proofs. In practice however it is often found, that as strong a conviction is produced by these, in the subjects to which they are appropriate, as by demonstration. We may practically be as fully and as justly convinced of the authenticity of the holy Scriptures, as of the equality of the angles of an equilateral triangle.

§. 5. *Demonstrationis species.*

DUÆ sunt Demonstrationis species. Prima, quæ demonstrat "Orî, sive *Quod res sit*; probando, vel simpliciter et directe *rem ita esse*, et tum vocatur *Ostensiva*, seu potius *Directa*; vel si *non sit*, absurdi aliquid necessario

secuturum. Hæc est quæ Græce dicitur Ἀπαγωγὴ, Latine, *ducens ad absurdum, impossibile, incommodum*, uno verbo recte dixeris *Obliquam*. Exemplum ejus dat reductio Syllogismi a *Baroko* vel *Bokardo* ad *Barbara*.

Ostensiva Directa fit duobus modis.

1. Quando aliquid demonstratur per *Effectum*; ut si diceres, *Luna Soli opposita nigra cernitur*; ergo *patitur Eclipsin*. 2. Quando per *Causam remotam*; ut si idem colligeres quia *Sol et Luna diametraliter opponuntur*. Quod si illud demonstrares per *Causam proximam*, quia nempe *Terra inter Solem et Lunam interponitur*, tum fieret

Secunda Demonstrationis species Διότι, i. e. quæ docet *Quare*, vel *Propter quid* res sit; causam ejus assignando, non quæmcunque, sed *proximam* seu *immediatam*. Sic enim statuunt Logici quod *Scientia* omnis est *Cognitio rei per causam*, sed *proprie dicta per propriam*, h. e. *proximam*: nam per remotam *Cur sit* aliquatenus ostenditur: nihil amplius quam *Quod sit* demonstratur.

Utriusque Speciei membra gradu differunt. Nam obliqua ὅτι est deterior directâ, quia non demonstrat *rem ita esse*, nisi quâtenus docet *eam aliter se habere non posse*; quod tametsi eodem redeat, tamen animo minus satisfacit; nam si par sit utrobique Certitudo, hujus tamen minor Evidentia est.

Habet et Διότι suos gradus ; quia potest esse causa proxima quæ non est *prima*, h. e. per se nota et indemonstrabilis : cujus ideo præfertur Evidentiâ, quia (contra quam cæteræ) suâ luce est conspicua, et nihil indiget alienâ. Quare, quæ hanc adhibet causam demonstratio, et habetur, et nominatur *Potissima*.

Sunt igitur ex mente Logicorum Demonstrandi quatuor modi ; quorum alter alteri evidentiâ, adeoque dignitate, præstat. *Valet Demonstratio obliqua ; Potens est quælibet Directa ; Potior quæ per causam proximam, Potissima quæ per primam demonstrat.* Hujus est vulgata illa Definitio, *Syllogismus constans veris, primis, immediatis, notioribus, prioribus, et causis Conclusionis.* Exemplum, nisi forte apud Mathematicos, an uspiam occurrat nescio.

1. Of the first general class of demonstrations (sc. which prove ὅτι, *that the thing is,*) the least evident is the Ἀπαγωγή, that is, *indirect proof*, or argument *ab impossibili*, so called because it evinces that *the thing is*, by displaying some manifest contradiction, absurdity, or impossibility as necessarily accompanying the supposition that *the thing is not*. This method should never be employed, except when no direct mode of proof is practicable. Several of the properties of circles are thus demonstrated by Euclid ; see book iii. prop. 1, 2, 4, 5, 6, 9, 10, 11, 12, 13, 16, 18, 23, 27 ; and the last propositions comprehended in prop. 7 and 8. Such arguments are indeed incontrovertible ; but the subjective

evidence produced by them is not so great as that which proceeds from direct demonstration, and consequently they do not affect the mind with equal satisfaction.

2. *Demonstration of the fact* (ὄρι) when *direct*, may be either *a priori*, or *a posteriori*. The latter, however, ought not to be introduced under the head of *demonstration*, in the sense in which the word is here used, namely, as consisting in a deduction of truths from premises either axiomatic or demonstrated. It is most adapted to physical or moral proof; thus, when a phenomenon or a fact is admitted or proved by sufficient testimony, the cause, or necessary antecedent to that fact or phenomenon, is manifestly inferred: as, the sight of an eclipse affords proof of the relative position of the earth, the sun, and the moon.

3. *Demonstration a priori* is twofold: it infers the conclusion either by means of some *remote cause*; and then it is considered as proving no more than the fact, and thus belongs to the *former* general class of demonstration, namely, the ὄρι; or by means of the *immediate cause*; and then it is considered as more evident, and as constituting the *second* class of demonstration; namely, the διόρι. If this immediate cause be an axiomatic principle, the evidence is conceived to be brought to the highest possible degree.

The term *cause* is here employed, not in its common signification, as denoting *that which produces or effects any thing*; but simply, for *that which we conceive to be prior to another thing in the order of nature, and without the existence of which that other thing could not exist*. The two senses are often coincident, but the latter comprehends the former as the genus of the species. Thus the intervention of the earth between the sun and the moon is, in both these senses, the cause of a lunar eclipse; but the parallelism of the opposite sides of parallelogram is,

in the latter sense only, a cause of the equality of the opposite sides and angles.

The terms *demonstration, knowledge, evidence, &c.* are vaguely employed, not only in common usage, but even by philosophical writers. They are often applied to the proofs and the belief of things *probable*. And where the probability is of the higher order, no inconvenience arises from such application of the words. It is only of importance in the study of each author, to ascertain as nearly as possible in what sense he is in the habit of using them. This is necessary to avoid ambiguity and misapprehension.

CAP. VI.

DE METHODO.

§. 1. *Methodi Species et Regulæ.*

METHODUS est talis dispositio partium alicujus disciplinæ, ut integra facilius discatur. Estque duplex. 1. *Inventionis*, quæ disciplinæ præcepta invenit; 2. *Doctrinæ*, quæ tradit. Prior procedit a sensibilibus, et singularibus, quæ sunt *nobis notiora*, ad intelligibilia, et universalialia, quæ sunt *notiora naturæ*: posterior, contra.

Method is by some writers considered to form a *fourth* branch of Logic. Of those who object to this arrangement, some comprehend it under the head of *reasoning*; others conceive it to be a species of *judgment*: while others with a greater degree of accuracy, suppose it to belong to the operation of *apprehension*. Bacon suggests that it should be esteemed a distinct and independent science.

The chief objects of method are, *the investigation and discovery of truth*; and *the communication of discovered truth*. There are accordingly two species of method, respectively adapted to these two objects. The former is called the method of *invention*; the latter, the method of *instruction*. The former proceeds from things relatively best known; the latter often, but not necessarily, the reverse. In physical and metaphysical subjects the things rela-

tively best known are individual things, the knowledge of which is conveyed to the mind by means of the external senses, or excited by acts of consciousness, or imperfectly acquired by means of analogies derived from sensible objects.

Methodus Doctrinæ duplex est. *Perfecta*, ἀκροαματική; et *Imperfecta*, ἐξωτερική. *Perfecta* rursus, vel *Universalis* est, quâ integra disciplina, vel *Particularis*, quâ aliqua disciplinæ pars docetur.

It is expedient to adapt the method of communicating truth to the state of the recipients. Those whose minds are prepared by previous study and acquaintance with similar topics, will admit of a more scientific and recondite arrangement than the illiterate. To the former, the *perfect, esoteric*, or *acroamatic* method may be better adapted; the latter require the use of a *popular, exoteric* method, even though it be scientifically less perfect. The ancient philosophers appear to have frequently adopted the *esoteric* form for the sake of excluding from knowledge all besides their own favoured followers.

Utraque duplex est :

1. *Compositoria* sive *Synthetica*, quæ inservit disciplinis Theoreticis; et a notione *Subjecti* incipiens, principia ejus et species investigat, donec a summo genere in istâ disciplinâ perveniat ad infimam speciem. 2. *Resolutoria* sive *Analytica*, quæ inservit disciplinis Prac-

ticis; et a notione *Finis* incipiens, subjectum, et tandem media investigat.

The names *analysis* and *synthesis*, which are employed to denote the two chief branches of logical or scientific method, are borrowed from the sciences which are conversant with material objects; in which the application of those words involves no obscurity. In other sciences there is often much difficulty in correctly appropriating the two terms; especially as it frequently occurs that the same method may, in different points of view, be considered either synthetic or analytic. The terms themselves are also used by some writers in so vague a manner as to convey a sense almost opposite to their real signification.

Nor is it necessary that every treatise should follow exclusively either the *analytic* or the *synthetic* system. On the contrary, it is often convenient to adopt the opposite methods even in different parts of a treatise on the same science or branch of science.

1. *Analysis* consists in the resolution of a compound into its component parts.

The *analytic method* therefore commences with complex substances or notions and reduces them first to more simple, and then, if possible, to the most simple and primary constituent substances or notions.

Since therefore all the objects which first present themselves to our senses, and all the notions which first affect the mind, are necessarily complex; and our earliest acquisitions in knowledge consist in separating and classifying the ingredients or parts of such objects and notions; it follows that the analytic method is first in the order of actual experience, and is usually the method of discovery or invention. It begins with those things which are most

known. It first ascertains their respective properties and relations, and then, either actually or mentally, separates, arranges, and classifies them; comparing or contrasting them with each other and with those of other objects; and tracing back consequents to their antecedents and effects to their causes. It thus proceeds by a path opposite to the course of nature, until it arrives (in reference to objects of sense) at simple or undecomposable substances; or (in reference to subjects of metaphysical apprehension) at the most abstract ideas; or (in reference to matters of science in general) at universal principles or laws.

This is in fact the process already described under the name of induction. (p. 212—224.) Thus it is observed that *heat* exists in the rays of the *sun*, in *culinary* and *subterraneous fire*, in *solids* or *liquids* exposed to the influence of fire, in *animal bodies*, &c. By repeated examinations and comparisons, the accidents of heat, (which are discovered by their existence in some things which contain that quality and their absence from others, and by the comparative degrees of heat in different substances,) are separated from those things which, being discovered to be uniformly present with it, are supposed to be essential to it. Hence is ultimately derived the definition of *heat*. The definition is necessarily the last step, since it expresses the nature of the thing, the discovery of which was the object of the analysis; or at least, the nearest *approximation* to that nature, which the state of the science or the limited powers of man can attain.

Again, the chemist *analyses* atmospheric air, water, &c. and reduces them to their principles or primary substances or gases.

The metaphysician *analyses* the notions conveyed to his mind through the medium of the senses by individual objects, while he compares them, forms to himself an artificial notion of the qualities which any number of them possess in common; proceeds

further to decompose that idea, and so on successively until he has reached that which he deems the most simple apprehension. That is, he proceeds from the individuals to the lowest species; from this to the proximate genus, and so on through the subalternate genera until he arrives at the highest or most abstract genus;—each process of the analysis bringing him to a less complex or more simple notion.

Thus the law of optics, that *the angle of reflection is equal to the angle of incidence*, is derived from the observation of many facts, each of them comprehending many other circumstances; for instance, that the light proceeded from the sun or a lamp; that the incident ray proceeded from a tower or a post; that the reflecting substance was a river or a mirror; that the refracted ray was ascertained by its meeting a human eye, or by its illuminating an opaque substance. But the philosopher by *analysis* separates all these constituent parts of the facts under examination, and fixes his attention on that one particular, the equality of the angle of incidence and reflection; from which he deduces the general law above stated.

Again, the practical geologist discovers the various strata of the earth under a great variety of circumstances, as to thickness, extent, nearness to the surface, obliquity, &c. But by pursuing the analytical method he deduces general laws as to the order and succession of the several strata; and from the phenomena which attend them, considered as effects, he acquires a probable conjecture of their origin and the causes of their relative position and qualities.

Thus moreover, if we would analytically acquire an acquaintance with the science of mineralogy, we may enter on a personal examination of all the earths, and stones, and metals, &c. which we can discover; scrutinizing distinctly their various properties and characteristics; classifying them by

placing together those in which there exists a striking similarity; reviewing the classes, and re-arranging them according to more comprehensive similarities; and so on repeatedly, until we arrive at certain classes of the most general nature, with the laws of their locality, formation, combinations, gravity, fusibility, crystallization, &c.

2. The *synthetic method* is the reverse of the analytic. It commences with that which is most simple, and following the process of nature, consists in combination. It lays down simple truths or general axiomatic principles, and proceeds from them to derivative and complex truths. It begins with such mental objects as are most abstracted; and traces them successively in the various aggregates of which they form part.

Thus, to recur to the examples above given; a treatise on caloric may begin with stating its simple nature as a *subtle fluid substance partaking of such and such qualities*; or, as a *vibratory affection of the particles of matter distinguished by such and such characteristics*; (according to the theory which the author judges most probable;) and then proceed to shew the subjects in which caloric is discoverable, its symptoms, effects, &c.

Again, a system of chemistry may be introduced by the description of the pure gases and other elementary substances, and thence proceed to the various combinations found in nature.

The metaphysician may, in like manner, begin with the definition of *Entity*; and then, adding to that simple idea the notions of dependence or independence, explain the complex notions of *substance* and *quality*, and so on, until he arrives at the aggregate of ideas comprehended in the lowest species, or the still more complex notion of the several individuals belonging to each species.

So a system of optics may naturally commence

with definitions and axioms, or the simple principles ascertained by induction; and proceed by the application of them to propositions dependent on them, and from these propositions to others successively demonstrable by means of them.

The geologist introduces his subject with general remarks on the structure of the earth and the character and order of the strata, together with a statement of the hypotheses on which his system is founded, which he illustrates by those examples from which he had first begun his series of discoveries, and derived those very principles.

The teacher of mineralogy may in like manner begin with the simple character of minerals as to form, structure, mode of fracture, gravity, &c. may thence proceed to the elements of minerals; then to the enumeration and description of the species of minerals in their pure state; and lastly, to their mixed state as actually found in the ore. In pursuing this course he arrives by synthesis at those complex objects which formed the commencement of his analytic examination and the source of his subsequent discoveries.

It appears then that the original discoverer of any science, or the philosopher who desires to improve it by fresh discoveries, must adopt the *analytic* method. But in communicating the science to others, either method may be adopted. The *analytic* has some advantages, inasmuch as it makes the student a partaker, as it were, in all the interest of the discovery. But the *synthetic* mode is more universally adapted for this purpose, as it displays the whole science at one view, and produces conviction in a manner less laborious, and consequently better suited to the generality of those who wish to acquire the science.

Geometrical analysis and synthesis are not in their nature different from physical or metaphysical

analysis and synthesis. The analytical mode in geometry consists in commencing with a proposition which is ascertained by trial to be true in a complex form; that is, in some individual cases; and, on the presumption of its being universally true, discovering what principles can be appealed to in its proof; tracing one step after another until the mind arrives at some known principle, the truth of which proves the correctness of the hypothesis. Thus if, without previous information, any one should perceive that in several practical instances the three angles of a triangle have appeared to be equal to two right angles, and should be desirous to ascertain whether that equation may be subsequently relied on as uniformly correct, he would perhaps observe that the production of one side of the triangle forms with the adjacent side angles equal to two right angles, one of which is one of the angles of the triangle. He would infer that if the outer angle could be proved equal to the two others, his hypothesis would be established. If previously acquainted with the properties of parallel lines, he would soon discover a method of so dividing the outer angle, that one portion should be equal to one of the remaining angles of the triangle, and the other to the other. Or if instead of producing a side, it should occur to him to draw a straight line through one angular point parallel to the subtending side, he would discover three angles which are together manifestly equal to two right angles, of which one is an angle of the triangle, and the other two evidently shewn, by the previously known properties of angles formed by parallel lines, to be equal to the other angles of the triangle. In communicating this proof, he might retain the same *analytical* method, retracing the process of his mind in the discovery; or he might reverse the order, and state the demonstration *synthetically*; which (except in the occasional

arguments ab impossibili) is the method adopted by Euclid in his Elements.

Regulæ Methodi generales hæ sunt. In tradendâ disciplinâ 1. Nihil desit aut redundet. 2. Singulæ partes inter se consentiant. 3. Nihil tractetur quod non sit subjecto aut fini homogeneum. 4. Singulæ partes aptis transitionibus connectantur. 5. Præcedat in docendo, sine quo alterum intelligi non potest, ipsum vero sine altero potest.

1. Correct method will equally avoid deficiency and redundancy. Cicero complains of *deficiency* in the method adopted by Panætius, (*Off.* 1. 3. see p. 71.) and records a similar charge brought against him by Antipater Tyrius, for the omission of *health* and *property* among *things useful*. (*Off.* ii. 24.) Aristotle in the introduction of his *Rhetoric* comments on the omission, by former writers on the subject, of that in which the essence of the art consists, namely, *proofs*. Needless repetitions, and enlarged discussions on those parts of a science which are obvious, incur the charge of *redundancy*. Too great a number of divisions and subdivisions, though they give an appearance of acuteness, are seldom free from redundancy: as, on the other hand, the old custom of reducing every thing to dichotomies must often have been the occasion of great imperfection and deficiency.

2. The divisions should be collateral, or immediately belonging to the same genus. Thus it

would be absurd to adopt the following method for a treatise on Logic: 1. *Of Simple Terms*; 2. *Of Judgment*; 3. *Of Categorical Syllogisms*; 4. *Of Hypothetical Syllogisms*, &c. The last two classes are of a subordinate rank to the two former. The third head should be of *Syllogisms*; of which those two should form subdivisions. See Cicero's comment on Epicurus's division of *desires*, page 70, 71. and the observations on page 71. in relation to the arrangement of his treatise *de Officiis*.

3. Digressions, even though they may be interesting in themselves, are injurious to the unity of a treatise. Even illustrations should be employed with caution, lest they draw off the thoughts from the main subject.

4. There should be a mutual dependence or natural sequence of the parts; each bearing a closer connexion with that immediately preceding it than with any other. The form of transition, as to the mere expression, is a matter of taste and expediency. It is more elegant when one part appears to glide naturally into another. But an abrupt transition is better adapted to secure perspicuity.

5. Whatever is essential to the knowledge of any topic must precede that topic. To this rule every other must yield, as is most fully illustrated in the instance of mathematics. A slight explanation of the constituent parts of propositions and syllogisms is introduced in this treatise by anticipation, (page 14—17.) in conformity with this rule.

§. 2. *De Methodo Mathematica.*

IN tradendis disciplinis suis Mathematici hâc utuntur methodo. 1. *Vocum significationem*

constituunt: h. e. *Vocabula artis* suo quodque loco sic definiunt, ut legem sibi statuunt iis nusquam uti, præterquam in eo sensu quem explicat definitio. 2. Definitionibus subjungunt *Axiomata*, quas et *κοινὰς ἐνοίας* vocant; h. e. effata sponte perspicua, quibus in decursu operis utendum vident. 3. Posthæc adjiciunt *Postulata*, quæ ad praxin spectant; suntque per se certa et evidentia; quæ proinde sine probatione concedi suo jure *postulant*. 4. Hisce positis, propositiones demonstrant; ordine, et, quoad fieri potest, affirmative: unâ lege contenti, ut, quicquid demonstratum eunt, ex ante datis vel probatis manifestum faciant. Cætera, in quibus methodi præceptores multi sunt et odiosi, non morantur.

Mathematicorum methodum in cæteris artibus et scientiis, si tenere non liceat, æmulari certe licet. Quo ad hanc quæque proprius accedit, eo cæteris perfectior, et ad docendum aptior videtur. Sed ad ea quæ docentur retinenda, nihil est utilius absoluti operis conspectu; in quo, ea quæ sunt ante (extra ordinem fortasse) demonstrata, suis quæque in locis, h. e. servatâ Logicorum methodo, repnantur.

Mathematicians lay the foundation of their subsequent demonstrations, first, in *definitions*, which, while their primary object is simply to fix the signification of the terms employed, serve at the same time

as *artificial* principles; and then, in certain *natural* principles, of which some are practical, called *postulates*; and others theoretical, which are called *axioms*.

The order of propositions (as for instance in Euclid) is partly natural, partly arbitrary. It is probable that any one who should independently discover the same truths, would arrange them very differently, and yet perhaps not less scientifically.

A synoptic arrangement of mathematical conclusions according to their subjects and relations is a profitable exercise. The theorems of the first book of Euclid, for example, might be thus arranged:

1. Of Lines and Angles, { 11 Cor. 13. 14.
15. and Cor. 1. 2.
2. Of Parallel lines, { 27. 28. 29. 30.
33.
3. Of Triangles in general: viz.
 - general properties, { 20. 18. 19. 17.
16. 32.
 - special properties, { 5. 6. 5 Cor. 6
Cor. 47. 48.
 - in relation: viz.
 - equal and similar, . . . 8. 4. 26. 34.
 - equal, 37. 38. 39. 40.
 - unequal or dissimilar, 7. 21. 24. 25.
4. Of Parallelograms in general, 34. 46 Cor.
 - in relation: viz.
 - . . . mutually, . 35. 36. 43. 47. 48.
 - . . . to triangles, . . 41.
5. Of Rectilineal figures in ge- { 32 Cor. 1. and
neral, { 2.

The attempts which have been made to apply the mathematical method to other sciences have not generally proved successful.

Of the following Appendix, the substance of the first section has been anticipated; (see p. 161, 162.) The *fallacies of diction* (§. 3.) may be illustrated by the observations on analogous and equivocal nouns, (p. 25—30,) on nouns of secondary intention, (p. 34—36,) and on the first and third rules of the structure of syllogisms, (p. 141, 142, and 145, 146.) The pretended *inexplicable* arguments or sophisms of the ancient logicians, §. 5—11, are far too childish to deserve notice. The fourth section, comprehending the *Fallaciæ extra dictionem*, constitutes the most useful part of the Appendix. Though the enumeration be in some respects defective, and in others redundant, yet it supplies a convenient classification of most of the chief fallacies which occur in argumentative and especially controversial writings. Reference is made to some of them in the observations on p. 211, 212. and 233, 234.

APPENDIX.

Solutio Sophismatum.

§. 1. **CUJUSCUNQUE** Syllogismi difficultas ad duas Species revocari poterit; alteram, quæ in *Argumenti Materiâ*, alteram, quæ in *Formâ* consistit: nam qui has duas expedire noverit, is in tertiâ, quæ ex ambarum complexione oritur, non hærebit.

Si inciderit *Materia* difficilis, unicum huic malo remedium est, disciplinam unde desumitur argumentum, fideliter didicisse; quod ut facias, *Instrumenti* operam tibi Logica præstabit; sed ulterius nihil confert. Proprium illi munus est syllogismi formam explorare; h. e. utrum conclusio ex præmissis consequatur propter ipsum colligendi modum: Sed an ponendæ sint præmissæ (nisi forte sint pure Logicæ) aliunde discendum est. Sicubi autem Syllogismus qui legitimus non est, videatur tamen; aut contra; (quorum utrumque sæpissime, et de causis pene infinitis accidit) formalem ejus consequentiam excutere est Artis Logicæ.

Qui hoc opus aggreditur, id sibi negoti

datam sciat, ut difficilem suum syllogismum, primo in categoricum purum, vel in plures, si opus sit, convertat; tum ad canonem accurate exigat; cujus operis ratio præcedente libro p. 133. et seqq. abunde declarata est. Summa rei huc redit. Consideranda est primo Conclusio; ejusque Termini solerter distinguendi: Prædicatum enim est Major Terminus Syllogismi; qui proinde Præmissam quoque Majorem indicabit; Subjectum pariter Minorem; et in utrâque sese offeret Argumentum sive Terminus Medius: Unde et si desit Præmissarum alterutra, facile suppleri poterit. Hisce cognitis, nec Figura Syllogismi, nec Modus latebit; qui si legitime, nec tamen vere concludere videatur, quærendum annon anceps sit aliquis trium Terminorum? nam si in iis nulla lateat ambiguitas, necessario falsa erit altera Præmissarum.

Hunc in modum licebit Syllogismum quemvis Categoricum purum explorare: qualis si non sit qui proponitur, quam facillime fiet, per ea quæ priore Libro, extremo Capite tertio, et toto quarto sunt ostensa. Siquid amplius restet, id exemplis melius quam præceptis docebitur.

§. 2. **ORDIEMUR** autem a facillimis; nempe veterum Sophistarum *Fallaciis*; quarum

13 species enumerat Aristoteles: sex, quæ *multiplicitate dictionis*; septem, quæ aliquo *extra dictionem* vitio laborarent. Et erat aliqua fortasse difficultas in earum aliquibus, juxta veterem disputandi (h. e. interrogandi) morem propositis; sed profecto nemo tam obtusus est, qui non easdem Syllogistice propositas agnoscat statim, et derideat. V. g. Erit fortasse qui rogatus *Quod non amiserit utrum habeat necne?* non intelligat se captum iri, sive simpliciter habere se, sive non habere responderit: at proposito hujusmodi Syllogismo, *Quod non amisisti habes; Cornua non amisisti; Ergo habes: Vel Quod non amisisti non habes; Oculos non amisisti; Ergo non habes: quid reponat nemo non videt.*

§. 3. FALLACIÆ *dictionis*, sive *in dictione*, sex sunt.

1. Fallacia *æquivocationis*, sive nata ex voce æquivocâ: ut, *Canis est animal; Sirius est canis; Ergo, Sirius est animal.* In hoc quatuor sunt termini; quorum duo, vox *Canis* æquivoce sumpta.

2. Fallacia *amphiboliæ*; sive nata ex sententiâ *amphibolâ*, h. e. ancipitis structuræ; ut, *Quod tangitur a Socrate illud sentit; Columna tangitur a Socrate; Ergo Columna sentit.* Vox

sentit, non sponte, sed in hâc structurâ est ambigua; cujus vi, in Majori significat *Sentit Socrates*; in Conclusionem, *Sentit Socratem*: Quare Syllogismus habet quatuor terminos.

3. et 4. Fallacia *Compositionis*, ubi datum in sensu diviso sumitur in sensu composito: ut, *Duo et Tria sunt par et impar: Quinque sunt Duo et Tria*; Ergo *Quinque sunt par et impar*. Fallacia *Divisionis*, quando datum in sensu composito sumitur in diviso; ut, *Planetæ sunt septem: Sol et Luna sunt planetæ*; Ergo *Sol et Luna sunt septem*. Utroque modo quatuor sunt termini si aperte loquaris. V. g. Prioris Syllogismi mens est, *Duo et Tria seorsim accepta sunt par et impar; Quinque sunt duo et tria in unum composita*, &c. Posterioris vero, *Planetæ collective sumpti sunt septem; Sol et Luna sunt planetæ distributive sumpti* &c. Unde duplex utrobique Medius.

“ Huc referri solent hujusmodi Orationes;
 “ *Possibile est album esse nigrum; Possibile est*
 “ *sedentem stare*: dubito an satis recte; quia
 “ tanto acumine non est opus. Potest quidem
 “ *album fieri nigrum*; et *Possibile est sedenti*
 “ *stare*; at si hæc velles, incongrue locutus es.
 “ Utraque igitur Oratio est simpliciter ne-
 “ ganda; vel ut aperte falsa si sit congrua, vel
 “ si non sit congrua, quia non est Propositio.”

5. Fallacia *Accentûs* seu *Prosodiæ* potius, quando pro eodem sumuntur quæ vel Litera,

vel Spiritu, vel Tempore, vel Accentu sunt diversa: ut, *Est servus, Ergo est cervus*; *Est ara, Ergo est hara*. *Est malum* (an apple), *Ergo malum* (an evil). *Venatur lepores, Ergo et lepóres*; quibus qui falli potest, debet.

6. Fallacia *Figuræ dictionis*, quando propter dictiones similes, quod de uno datur de altero arripitur; idque vel *Grammatice*, ut *Musa est Fœminini generis, Ergo et Poeta*: vel *Logice*, ut *Docere est agere, Ergo et Videre*. Hæc Materiâ potius quam Formâ peccat; et operose solvi non postulat: ponit aliquid aperte falsum; quo negato evertitur.

§. 4. FALLACIÆ *extra dictionem* sunt septem.

1. Fallacia *Accidentis*; quando *accidentarium* aliquod confunditur cum eo quod est *essentiale* seu principaliter intentum: ut, *Quod emisti comedisti; Crudum emisti; Ergo Crudum comedisti*: in quo *Quod emisti*, et *Quale emisti*, confunduntur; unde quatuor termini.

2. Fallacia *a Dicto secundum Quid ad Dictum Simpliciter*; quando proceditur a voce determinate sumptâ, ad eandem absolute positam: ut, *Æthiops est albus dentes; Ergo albus*: unde quatuor esse terminos necesse est.

3. Fallacia *Ignorationis Elenchi*. *Elenchus*

proprie Syllogismus est adversarium redarguens; confirmando scilicet quod illius sententiæ contradicit. Quare in hanc incidit Fallaciam qui se putat adversarium redarguere, non servatis *Contradicendi Legibus*, (de quibus vide pag. 107.—118.) Qui in his peccat, docendus est se nescire Quid sit Contradicere.

4. Fallacia *a non-causâ pro causâ*; sive sit a *non-verâ pro verâ*; sive a *non-tali pro tali*: ut *Cometa fulsit; Ergo Bellum erit*; Nullo modo; nam si fuerit, aliis de causis futurum est. *Quod inebriat prohibendum est; Vinum inebriat*; Nequaquam vero, sed abusus vini. Hæc Fallacia bene solvitur negando causam falsam; melius, adducendo germanam.

“ Huc refertur ab aliquibus (quâ de causâ “ non video) hoc Sophisma; *Qui magis esurit,* “ *plus comedit; Qui minus comedit, magis esu-* “ *rit; Ergo Qui minus comedit, plus comedit.* “ Sed qui hoc, vel hujus simile attulerit (ut in- “ numera afferri solent) docendus est congrue “ loqui: Hoc si fecerit dicet in hoc casu, *Qui* “ *magis esurit plus comedet; Qui minus comedit,* “ *magis esurit; Ergo Qui minus comedit, plus* “ *comedet.*”

5. Fallacia *Consequentis*, quando infertur quod non sequitur: ut, *Animal est; Ergo, Est Homo*. Hic memineris, quod si recte ratione uti volumus, Consequentia aut directa, immediata, formalis, aut plane nulla est; peccat

enim contra aliquam Dialecticæ regulam; ad quam si provoces, refelletur.

6. Fallacia *Petitionis Principii*, cum ut datum assumitur, quod probatum oportuit. V. g. Cum probatur aliquid vel per seipsum, (quæ vocatur *Petitio statim*,) ut, *Homo est, Ergo, est Homo*: Vel per Synonymum; ut *Ensis est acutus*; Ergo, *Gladius*: Vel per æque ignotum; ut *Hic est Pater Melchisedek*; Ergo, *Hæc Mater*: Vel per ignotius; ut, *Hoc Quadratum est hujus Trianguli duplum, Quia huic Circulo æquale*: Vel per Circulum; resumendo scilicet quod relictum est; ut si diceres, *Ignis est calidus, Ergo urit*; et post pauca, *Ignis urit, Ergo est calidus*.

7. Fallacia *plurium interrogationum*, quando plures quæstiones velut una proponuntur; v. g. *Suntne mel et fel dulcia? Estne homo animal et lapis?* Evertitur, ad singulas quæstiones distincte respondendo; sicut fecit Menedemus Eretriensis qui roganti eum Alexino, *Numquid patrem verberare desiisset? Nec verberavi*, inquit, *nec desii*.

Atque hæ sunt tredecim Sophismatum formulæ veteribus usitatiores, quæ tironibus Logicis in exemplum proponi solent. Poterant esse pauciores; nam videntur aliquæ coincidere; et præterea tres, *Non-causa pro Causa*, *Petitio Principii*, et *Plures interrogationes*,

non sunt fallaciæ proprie dictæ, h. e. syllogismi formâ peccantes; sed vitia male opponentis. Poterant et plures; sed cum hic numerus Aristoteli satisfacisset, idem omnibus post illum Logicis satisfacit.

§. 5. SOPHISMATIBUS ex sententiâ veterum accensendæ sunt *Inexplicabiles* (ut vocantur) *Rationes*, quas Megarici, Stoici, alique Eristicam professi, propriis nominibus insignivere, *Crocodilus*, *Mentiens*, *Obvelatus*, &c. quas plerasque collegit *Gassendus*, et retulit in *Libro de Origine et Varietate Logicæ*: Nos eodem fere ordine explorabimus quo ab illo sunt propositæ.

1. ACHILLES vocatur argumentum quo usus est Zeno Eleates, non ut motum tolleret, quod vulgo sed falso dicitur; sed ut ostenderet continuum non esse infinite divisibile, quia hoc dato motus tolleretur. Argumentum sic se habet. Sit Achilles quantum voles ποδας ἄκρως, puta decuplo velocior testudine. Qui-escente illo, confecerit testudo partem aliquam (puta decimam) spatii percurrendi. Tum procedat Achilles, idemque spatium percurrat: progredietur interim testudo per partem ejus decimam, h. e. totius spatii centesimam; hanc conficiat Achilles, et percurret interim testudo hujus centesimæ decimam; et sic de-

inceps in infinitum; quo fiet ut Achilles nunquam assequatur testudinem.

Ineptum est hoc Sophisma. 1. Quia solvitur ambulando; quod fecit Diogenes. 2. Quoniam ex ipsâ hypothesis, dum testudo quæ præcessit spatio A, conficit $\frac{2}{3}$ A, Achilles conficiet 2 A; adeoque statim assequetur eam, et antecedit. Sed hoc (inquies) in casu proposito nunquam fiet; Recte; Ne enim fiat, in ipso proponendi modo clam inseritur nova conditio. Nam 3. Argumentum aliis verbis hoc dicit; Si Achillem decuplo velociorem præcesserit testudo; et *uterque meo pergat arbitratu*; Ego perficiam ne Achilles assequatur testudinem: Quare prorsus nunquam assequetur. Quæ est *Fallacia a dicto secundum quid, ad dictum simpliciter*.

2. Diodorus Cronus, quod Sophismata Stilponis non solvisset, exinde *δῖνος* appellatus est; id cognominis aliunde promeritus, quod ad hunc modum contra motum disputaret. *Mobile movetur vel in quo est loco, vel in quo non est: At neutrum horum; Ergo Non omnino*. Unde facete illum lusit Herophilus, qui ut luxatum illi humerum restitueret rogatus, *Tuus (inquit) humerus vel in quo erat loco existens excidit, vel in quo non erat. Sed neutrum horum; Ergo non omnino*. Diodori argumento breviter et perspicue respondet Gassendus, Quod movetur moveri a loco in quo erat,

per locum in quo est, (sive quem pertransit,) *ad locum* in quo nondum est, sed futurum est.

3. RECIPROCUM vocat Argumentum Gellius, quod Græce dicitur Ἀντιστρέφον: cui illustrando conficta est Fabula quæ Græcorum vanitatem olet. Narrant enim inter Protagoram et Euathlum, vel (ut facetiæ locus sit) inter Coracem et Tisiam convenisse, ut hunc ille Dialecticam doceret; idque hâc lege, ut dimidium mercedis statim acciperet; reliquum, cum discipulus causam vicisset. Primam exinde litem cum Discipulo contestatus est Magister, cum mercedis reliquum lege peteret, apud Judices vero sic agebat: *Ego si vicerò, Tisia, Tu solves ex sententiâ, sin minus, ex pacto; utroque igitur modo solvendum est.* Respondit Tisias, *Ego nihil solvo; Tu si viceris, ex pacto; sin minus, ex sententiâ.* Tanto utrinque acumine percussi boni judices, exclamarunt Κακοῦ Κόρακος κακὸν ὄνον, causamque in longissimum diem distulerunt.

Ineptum erat Coracis Dilemma quia potuit tam bene retorqueri. Nihilominus callide agebat, si id Judices vidissent. Nam cum mercedem inique peteret, causâ cadere debebat; quamprimum autem cecidisset, ei merces ex pacto debebatur.

§. 6. 4. MENTIENS, qui est Græce Ψευδόμενος, Chrysippi Syllogismus ne ab ipso quidem so-

lutus, præter cæteros insolubilis habetur. Eum Cicero sic enuntiat: *Si dicis te mentiri, et verum dicis, mentiris; Sed dicis te mentiri, et verum dicis; mentiris igitur.*

Congrue loquere, Chrysippe, et intelliges te vel nihil prorsus, vel nihil dicere difficile. Qui se dicit *mentitum*, et verum dicit, *mentitus est; Qui mentiturum, mentietur.* Horum utrumque verum est, et nemini obscurum: Sed qui ut verum simul dicat et mentiatur dicit unum aliquid, cujus partes sibi invicem contradicunt, is nec verum, nec falsum, sed omnino nihil dicit: quando enim sententiæ pars una evertit alteram, tota nihil prorsus significat, sed inaniter strepit.

Subtilius disputare videbantur qui sic agebant: *Cretenses esse mendaces dicit Epimenides Cretensis: Mentitur igitur; Ergo Illi sunt veraces; Ergo et Ille verum dicit; Ergo Illi rursus sunt mendaces &c.* Sed profecto nihil stultius est hoc argumento, nisi vox *Cretenses* eos ad unum omnes significet, et omnis mendax quicquid dicit mentiatur.

Videtur hic *Mentiens* peperisse subtilem illam Scholasticorum *de Insolubilibus* doctrinam. “ Nam talia argumenta (inquit *Occam*) non
 “ possunt fieri nisi quando actus humanus re-
 “ spicit istum terminum *Falsum*, vel aliquem
 “ consimilem affirmative; vel hunc terminum
 “ *Verum*, vel aliquem consimilem negative.”

Esse hæc *Sophismata* ante dixerat; nec vocari *Insolubilia*, quia nullo modo solvi possunt, sed quia cum difficultate solvuntur.

Insolubilis exemplum sic proponitur. Incipiat Socrates sic loqui, *Socrates dicit falsum*; et nihil amplius loquatur: tum interroget aliquis, utrum vera an falsa sit hæc propositio. Respondeo, nec veram nec falsam esse, sed nihil significare; nisi aliquid aliud respiciat, quod a Socrate ante dictum supponitur. Qui enim profert hæc verba, *Socrates dicit falsum*, fert iudicium de dicto Socratis; quique fert iudicium, necessario præsupponit aliquid de quo iudicet: Unde cum sententia præsupponat objectum suum, clarum est eandem numero propositionem, et sententiam et ejus objectum esse non posse. Quare et Scholarum subtilitas hic nihil proficit; nihilque opus est plura dicere de Insolubilibus.

5. FALLENS *Διαλανθάνων*, vel ut alii *Διαλεληθώς*, de Juramento ludit sicut *Mentiens* de nudâ affirmatione. E. g. *Qui jurat se falsum jurare et falsum jurat, vere jurat*. Quare eodem fere modo quo *Mentiens* explicatur.

§. 7. 6. et 7. OBVELATUS, alio nomine ELECTRA, est *Fallacia a dicto secundum Quid, ad dictum Simpliciter*. Nam colligere pertendit, quod et Patrem Filius et Soror Fratrem, h. e.

Electra Orestem *prorsus* nesciat, si eundem *velo obductum* se nescire fateatur.

8. et 9. ACERVALIS et CALVUS, sunt ejusdem Sophismatis duo tantum exempla. V. g. Si rogatus a sophistâ, neges te *Calvum* fieri amisso crine uno, duobus, tribus, et sic deinceps ad 99, sed amissis centum concedas; vel eodem modo neges 99 grana *Acervum* esse, centum autem esse fatearis; concludet ille grano unico adjecto *Acervum* fieri; crine unico amisso, *Calvitiem*. Facile autem respondetur, *Unum centesimum* non esse *Unicum*; nam est Unum cum nonaginta novem. Vel si mavis sic; Fit *Acervus*, grano uno, sed adjecto; adeoque non unico, sed cum pluribus aliis. Fit *Calvities* crine uno, sed post multos alios, amisso.

10. CORNUTUS et *Ceratinus*, *Ceratine*, *Ceratis*, et *Ceras* dicitur Sophisma illud ante memoratum, *Quod non amisisti habes* &c. Quæ est *Petitio Principii*; nam supponit te cornua habuisse.

Ineptissima hæc Fallacia plus acuminis præfert juxta veterem disputandi modum rogando proposita. Erit enim fortasse, qui rogatus, *Quod non amiserit, utrum habeat necne?* non intelligat se captum iri, si simpliciter respondeat; sive habere se, sive non habere dicat. Nam eum adiget sophista, ut vel se habere cornua, vel non habere oculos fateatur.

11. Acutus sibi videbatur Menedemus (Eretriensis scil. quem ἐρισικώτατον appellat Laërtius) quum ad hunc modum nugaretur. *Diversum, a Diverso Diversum est; Prodesse est a Bono Diversum; Prodesse igitur non est Bonum.* Quæ est crassa et putida *Æquivocatio*; et nihil amplius.

§. 8. 12. CROCODILUS a Chrysippo inventus, qui ad Fallaciam Consequentis revocari poterit, sic proponitur. *Surripuerat infantem Crocodilus; redditurum se, hâc lege pollicitus, ut divinaret mater, utrum apud se reddere an non reddere constituerit.* Si dicat mater, *Non reddere*; mentietur si infantem receperit: Si dicat *reddere*: non reddet quia hoc est falsum. Quamobrem Chrysippus nihil esse putat difficilius quam responsum matri suggerere. Nec injuriâ, si lubricum putet divinare; sed immerito, si in hoc (ut videtur) hæreret, Quod si puerum Crocodilus non reddere constituerit, quamvis id Mater divinaverit non reddet: quasi consilium quod primum intenderat Crocodilus, postquam indicatum est, repudiare non possit, et ex pacto non debeat: nam si Mater recte divinaverit, recepto puero, non mentitur illa, sed consilium mutat Crocodilus.

13. METENS Θερίζων qui vocatur, ita placuit Zenoni Stoico, ut Sophistæ a quo eum didicerat duplum pactæ mercedis numeraret. Propo-

nente Ammonio sic se habet: *Si messurus es, non fortasse metes, fortasse non metes, sed metes omnino*; Pariter, *si non messurus es, non fortasse metes, fortasse non metes, sed prorsus non metes*: Atqui *vel metere te, vel non metere, necessarium est*; perit igitur Fortasse, quod in *neutrâ hypothesis locum habet*. Fortunatum Sophistam! qui mercede duplâ hunc fumum vendidit; *Vel hoc, vel illud evenire est necesse*; Quare *hoc et non illud necessario eventurum est*. Nihil amplius dicit qui sic dixerit, *Ut vel metas vel non metas est necesse*; Ergo *Vel necessario metes vel necessario non metes*. Breviter, hæc *Fullacia Divisionis* est; nam in Antecedente, *Modus Necessario*, non tribuitur nisi toti Disjunctivæ; sed in Consequente dicitur de eisdem membris seorsim acceptis.

14. IGNAVA RATIO vel ἄγρὸς λόγος appellatur, qui si valeat nihil est omnino quod agamus in vita. V. g. *Si Fatum est ægroto convalescere, sive medicum adhibuerit sive non adhibuerit, convalescet*: Pariter, *si illi Fatum est non convalescere, sive medicum adhibuerit sive non adhibuerit, non convalescet*: et alterutrum *Fatum est*; medicum ergo adhibere nihil attinet. Lepide respondit Chrysippus posse esse *confatalia* adhibere medicum et convalescere: Quemadmodum et Zeno, quando, servum furrem verberabat, *Furari sibi Fatum esse* dicenti, et *Vapulare* respondit. Sed commodius dici

videtur, Si sit Fatum, hoc valere argumen-
tum; idque vel solum sufficere ne Fatum esse
concedamus. Argumentum hocce et quæ præ-
cedunt pp. 291, 292. N^o. 2. et 3. ex Dilemmatis
legibus facile solvuntur.

§. 9. **PLURA** sunt apud Autores Inexplica-
bilium Rationum nomina; quorum exempla
Gassendus quia nusquam invenisset, ipse re-
perit. Verum ea relinquimus studiosis; qui-
bus etiam consulto est relictum, ut quæ sunt
hactenus explicata, illi explicent in Syllogis-
mos conversa. Exempla Gassendi ne deside-
rent qui libro carent, non pigebit exscribere.

Dominans, Κυριεύων. Themistoclis filius nec
Græcis imperat, nec de imperando cogitat;
Verum imperat Matri, quæ imperat Themis-
tocli, qui Græcis imperat; *Dominatur* itaque
Græcis, *et non-dominatur.*

Conficiens, Πεγαίνων. Multum itineris *conficit*,
et non conficit Canis, qui in rotâ gradiens totum
diem, ex eodem tamen loco non recedit.

Superpositus vel *Superlativus*, Ὑπερθετικὸς, So-
riti forte affinis; Ut si roges quota sit palea,
quæ si mulo *super-imponatur* ille oneri suc-
cumbat?

Nullus, Οὐτις. Homo in communi nec est
hic, nec ille, nec alius homo singularis, Ergo
Nullus. Vel ut tritum Sophisma: *Quod Ego*
sum, Tu non es; Ego sum homo; Ergo Tu non

es. Vel denique ut Chrysippus; *Qui est Megaris, non est Athenis; Homo est Megaris; Ergo Homo non est Athenis.*

Subjicit Gassendus ex Laërtio has Chrysippi Rogatiunculas. 1. Qui non initiatis indicat mysteria, impie agit. Sed hoc facit Hierophantes; *Ergo Impie agit.* 2. Est quoddam caput; Id tu non habes; *Ergo Caput non habes.* 3. Id quod loqueris ex ore tuo egreditur: Currum loqueris; *Ergo Currus ex ore tuo egreditur.*

§. 10. NON temperaturos sibi juvenes satis scio quin dissiliant risu, ubi hæc tam futilia intellexerint a gravissimis philosophis serio fuisse proposita; et veteribus adeo difficilia haberi, ut Philetas Cous præceptor Ptolemæi Philadelphi solius *Mentientis* explicandi studio confectus interierit. Quamvis autem Aristotelis beneficio, videantur ista ut sunt levia, in iis tamen prompte atque artificiose solvendis non inutiliter sese juvenes exercebunt: nam in gravissimis disputationibus, hæc eadem recocta Novæ præsertim Philosophiæ cultores sæpissime reponunt.

V. g. *Gassendus* Vacuum quod appellat *disseminatum* eodem fere sophismate demonstrare pertendit, quo olim *Zeno contra motum* utebatur: suamque *Hobbius* de *Necessitate* sententiam iisdem propugnat fallaciis quibus *Fa-*

tum Stoici : aliaque plurima hujus generis, quæ sunt nobis prætereunda, studiosis inter legendum occurrent.

Fefellit virum satis alias perspicacem hæc sequela, quæ in ambiguis distinguendis versatum minime (opinor) fefellisset ; *Possum datæ peripheriæ trientem exhibere ; Possum igitur datam peripheriam trisecare ;* cujus falsitatem ipsa praxis redarguit ; neque enim trientem exhibuit, sed alterius circuli peripheriam trienti parem : h. e. non *trientem* ipsum, sed *trientis valorem* : Paria fecisset qui, oblatum sibi solidum trisecturus, ne attrectato quidem solido porrexisset drachmam.

§. 11. **VOLENTEM** hic desinere pungit scrupulus, qui nonnullos hodie Mathematicos male habet. Nam in demonstrationibus quibusdam, conclusionem ex sui contradictoriâ, per legitimas necessariasque consequentias directe inferri volunt. Quod si ita sit, miror a veteribus, præsertim Scepticis non fuisse animadversum ; quippe hoc dato tota ruat Logica necesse est.

Dicunt tamen Theodosium demonstrasse quod *si maris superficies non est spherica, est spherica*. Verum ille nihil tale demonstravit ; sed tantum maris superficiem *si nondum esset, fore sphericam* : siquid enim emineat (inquit)

illud statim, ex naturâ humidi, subsidet : Unde si maris superficies sit (ut non est) inæqualis fiet perfecte sphærica.

Videamus aliud exemplum. Sunt numeri duo inæquales, et inter se primi ; dico quod eorum differentia ad minorem prima est. *Esto enim numerus aliquis qui metitur minorem ; idemque metiatur differentiam : Ergo metitur eorum summam ; Ergo metitur majorem, huic summæ parem ; Ergo non metitur minorem.*

Possum hoc loco dicere quod mendose colligitur : si quis enim numerus minorem metiatur ex supposito, et majorem ex demonstrato ; colligendum erat *datos esse inter se compositos, quod est contra Hypothesin.* Verum ne pluribus exemplis sim molestus, malo generale responsum. Dico igitur, quod nulla hujusmodi demonstratio supponit solam suæ conclusionis contradictoriam ; sed quælibet cum contradictoriâ ponit aliquid quod eam evertit ; et evertere, demonstrando ostendit. Quare conclusionem non infert ex ejus contradictoriâ ; sed ex contradictoriâ cum contradictoriæ eversivâ : quod si faciat nihil mirum. Nam *Si Socrates v. g. est homo, et irrationalis, tum Si est homo, non est homo : Et Si Socrates est mortuus, et scit se esse mortuum, tum Si est mortuus, non est mortuus : Et universaliter, Si et hæc est vera et quæ hanc evertit : tum Si hæc est vera, non est vera : qui-*

bus omnibus inest una quæ est prorsus nulla difficultas. Ubi enim Hypothesis evertit suppositionem, quidni ex Hypothési sequatur, quod suppositioni contradicit?

PROMISCUOUS SYLLOGISMS

FOR EXERCISE.

FIRST SERIES.

Categorical Syllogisms.

1.

SATIRE is a legitimate mode of exposing the failings of others; the calling others by ill names is not satire: consequently it is not a legitimate mode of exposing their failings.

2.

A tyranny is inconsistent with the liberty of the subject; but the English government is not inconsistent with the liberty of the subject: and this undeniable fact affords a sufficient evidence that the English government is not a tyranny.

3.

True poets are formed by nature, and not by art; but paltry rhymesters compose according to art, and not by the impulse of nature: consequently paltry rhymesters are not true poets.

4.

Every amiable man merits the esteem and respect of his neighbours; now it is also certain, that all whose pure aim is to do good to their fellow-creatures merit the esteem and respect of their neighbours: whence we must necessarily infer, that all whose pure aim is to do good to their fellow-creatures are amiable men.

5.

Liberality is the means of making many happy ; it is not, however, the way to become rich : so that that which is the way to become rich is not the means of making many happy.

6.

An art is a collection of rules tending to a certain end ; rhetoric is a collection of rules tending to a certain end : therefore rhetoric is an art.

7.

The saying is no less true than common, that murderers never escape punishment ; yet even murderers hope to elude the laws of their country : of those therefore who hope to elude the laws of their country, some do not escape punishment.

8.

No amiable man should be despised ; every man in whom are united virtue and politeness is amiable : some therefore of those happy persons in whom these two excellent qualities are united ought not to be despised.

9.

Every man of solid understanding lives virtuously ; every true Christian lives virtuously : therefore every true Christian is a man of solid understanding.

10.

No diligent student should be deprived of just commendation ; every diligent student abstains from idleness and trifling amusements : therefore no one who abstains from these should be deprived of just commendation.

11.

A wise and affectionate parent governs his family uprightly ; he is worthy of love and honour who governs his family uprightly : therefore a wise and affectionate parent is worthy of love and honour.

12.

Those things which cannot be enumerated do not exist; innate ideas cannot be enumerated; therefore innate ideas do not exist.

13.

The cook is always about the fire; the fire is the highest of all the elements; therefore of all sciences the cook's occupation is the highest.

14.

He who seeks the best end in the use of the most suitable means is wise; he likewise is wise who applies his learning to the purposes of life and the welfare of society: therefore he who applies his learning to the purposes of life and the welfare of society seeks the best end in the use of the most suitable means.

15.

The testimony extorted from a reluctant witness is likely to be true; the testimony of an enemy is thus extorted, and is consequently likely to be true.

16.

Hatred is an odious vice; but, alas! there are many odious vices which are not abhorred as they deserve; which circumstance evinces the fact that hatred is not abhorred as it deserves.

17.

Some works of art are useful; all works of human invention are works of art; therefore some works of human invention are useful.

18.

All books of literature are, it must be acknowledged, subject to error; now the fact is, that they are all of man's invention: consequently we are compelled to draw the painful inference, that all things of human invention are subject to error.

19.

All who are endued with prudence are worthy of credit and confidence; no madmen or enthusiasts are endued with prudence: it is manifest then that no madmen or enthusiasts are worthy of credit and confidence.

20.

None of the brute creation are immortal beings; but all immortal beings have the power of motion: therefore some things which have the power of motion are not of the brute creation.

21.

A decorous conduct is the part of true wisdom; it is also the part of true wisdom to discountenance foolish innovations: therefore to discountenance foolish innovations is decorous conduct.

22.

A furious bull is a dangerous animal; Luther was attacked by a furious bull: therefore Luther was attacked by a dangerous animal.

23.

Love is a passion; my brother Joseph is in love: therefore he is in a passion.

24.

All the helots were slaves; all Athenians were free: therefore it follows that no Athenians were helots.

25.

A natural property cannot be altered by habit; to fall downwards is the natural property of a heavy body: therefore a heavy body cannot be habituated to fall upwards.

26.

Every prudent man is anxious to support the authority of government; no seditious subject is an-

xious to support it: therefore it is demonstrated that no seditious subject is a prudent man.

27.

A language which is composed of several other languages possesses more copiousness than elegance; but such is the English language as now spoken: the English language therefore as now spoken possesses more copiousness than elegance.

28.

To kill a man is a sin; a murderer is a man; to kill a murderer is consequently a sin.

29.

He who is assiduous in surmounting difficulties deserves applause; now Demosthenes displayed unwearied assiduity in correcting the natural defects of his speech, and in fact became the greatest orator of Greece; on these accounts therefore he was a man deserving of a high degree of applause.

30.

That which excites a passion precedes it; insult excites anger; insult therefore precedes anger.

31.

Every mean artifice should be exploded from the dealings of men of honour; now equivocation is undoubtedly a mean and ungenerous artifice; as such therefore it ought by no means to be admitted among persons of probity.

32.

There are things which though confessedly liable to change, and therefore imperfect, are yet useful; some parts of the Mosaic law were liable to change, and therefore imperfect; therefore some parts of the Mosaic law were useful.

33.

It is noticed by Aristotle, that all animals which possess fortitude have the extremities of their limbs large; but animals possessed of fortitude disregard the insults of inferior creatures; therefore all animals characterized by large extremities disregard the insults of inferior creatures.

34.

Self-murder must be condemned as a most heinous offence; yet there are species of voluntary death which cannot be justly denominated by that opprobrious name of self-murder: it is to be inferred then, that there are species of voluntary death which are not necessarily to be condemned as heinous offences.

35.

Suicide is not defensible on any principle of morality; some species of voluntary death are not suicide; therefore some species of voluntary death may be defended on the principles of morality.

36.

Some of the primary planets are distinguished by the name asteroids; but the Sun, the Moon, the Earth, and Saturn, are not called asteroids: consequently they are not primary planets.

37.

Some virtuous men have made gross mistakes; all who live uprightly are virtuous men: some consequently who live uprightly have made gross mistakes.

38.

Every real Christian walks circumspectly; some who profess to be Christians do not so walk: therefore some who profess to be Christians are not really such.

39.

Some virtuous persons enjoy much hilarity of disposition; all virtuous persons are temperate: therefore all temperate persons enjoy much hilarity of disposition.

40.

That which incurs the hatred of the many is not thereby proved to be necessarily bad; the softer virtues, as justice, temperance, and liberality, do not incur the hatred of the many: these virtues therefore cannot be proved to be bad.

41.

Those things which depend on accident do not admit of demonstration; mathematical conclusions admit of demonstration: therefore mathematical conclusions are not accidental.

42.

Some there are who refuse to indulge themselves in unlawful pleasures; all men are naturally inclined to unlawful pleasures: therefore some who are naturally so inclined refuse to indulge themselves in them.

43.

The acquisition of every science which is of any real benefit among men requires attention and diligence; but every science has many difficulties, which cannot be overcome except by perseverance: therefore some things which have difficulties such as cannot be overcome but by perseverance, and which require diligence and attention, are useful sciences, and of real benefit to men.

44.

The attainment of the utmost extent of learning is an object of universal desire; yet such an acqui-

sition will not render a man happy or virtuous : it appears then that that which will not render a man happy or virtuous is an object of universal desire.

45.

It is prudent to employ our thoughts about fundamental truths ; for our life is short : and such ought surely to be the aim of those who have no long time in which to acquire an acquaintance with any truths.

46.

Every wise and prudent man abstains from unlawful pleasures ; all who obey the divine law abstain from unlawful pleasures : all who obey the divine law are wise and prudent men.

47.

All Englishmen are lovers of liberty ; no Dutchman is an Englishman : therefore no Dutchman is a lover of liberty.

48.

Some heathen authors deserve credit ; some heathen authors relate prodigies : therefore some prodigies deserve credit.

49.

Nothing shameful or disgraceful should be allowed to taint the practice of a man of honour ; no fraud of any kind should be allowed to taint such a man's practice ; therefore every fraud is shameful and disgraceful.

50.

Some good men maintain erroneous sentiments ; all heretics maintain erroneous sentiments : therefore some heretics are good men.

51.

All acts of parliament require the concurrence of the king, lords, and commons; orders in council are not acts of parliament: therefore orders in council do not require the concurrence of the king, lords, and commons.

52.

There are cheap books, the object of which is to sap the foundations of government; the new editions of the classics are cheap books: those editions therefore have for their object to sap the foundations of government.

53.

All the public buildings in Oxford lose some portion of their splendour and dignity by the appearance of decay; in fact, those buildings consist of a kind of inferior oölite: therefore all buildings constructed of that inferior oölite lose some portion of their splendour and dignity by the appearance of decay.

54.

Some of the basest of men do not discover to the world their true character; all who do not discover to the world their true character are hypocrites: therefore some hypocrites are the basest of men.

55.

It cannot be denied by any reasonable person, that *some* even of those who are justly denominated *wise men* have in the course of their life committed *great errors*; nor is it less universally admitted, that *they who unite learning with experience* are truly deserving of the character of *wise men*: the necessary inference then is most evident, namely, that however decisive and almost infallible we are apt to suppose their testimony to be in any matter of prudence and judgment, *there* yet have been, and

still doubtless are, persons uniting learning with experience, who have notwithstanding committed great errors.

56.

They who are not to be trusted are always liable to suspicion; liars are not to be trusted; liars are always liable to suspicion.

57.

No traitors ought to be suffered to escape condign punishment; nor should those men be suffered to escape condign punishment who excite their fellow-subjects to rebellious actions; therefore they who excite their fellow-subjects to rebellious acts are traitors.

58.

No science is to be acquired without some degree of serious application; some things essential to the welfare of society are sciences; some things therefore essential to the welfare of human society are not to be acquired without some degree of serious application.

59.

Subjects are under obligation to obey their king; George the Fourth is the king of England; therefore Englishmen are bound to obey George the Fourth.

60.

Whatever is in its nature quite immaterial deserves no particular concern; the soul of man is immaterial; therefore the soul of man demands no particular concern.

61.

There are hopes entertained by many which must terminate in disappointment; some hopes in fact

evidently rest on an insufficient foundation ; some things therefore which rest on an insufficient foundation must terminate in disappointment.

62.

All stars are suns of planetary systems ; but all suns are supposed to be opaque bodies, surrounded by a luminous atmosphere : consequently all such bodies are stars.

63.

Some heavenly bodies which are not stationary are planets ; comets are of that description ; it follows then that comets are planets.

64.

Whatsoever merits any degree of commendation must proceed from some other cause than mere weakness ; some instances of good-nature however do not proceed from any principle besides weakness ; therefore there are instances of good-nature which do not merit any degree of commendation.

65.

Every man who knows the value of time will be unwilling to waste it in the pursuit of trifles ; all those are guilty of this folly who employ their days in light reading to the neglect of such works as may tend to instruct and form the mind ; such persons therefore must be acknowledged to be ignorant of the value of time.

66.

A government which supports the traffic in slaves persists in an offence against religion and virtue ; our own government has put an end to that traffic ; it does not therefore persist in any offence against religion and virtue.

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67.

Some of the most splendid virtues are often tarnished by their union with baser principles ; fortitude is one of the most splendid virtues ; fortitude therefore is often tarnished by its union with baser principles.

68.

No metals have a vegetative power ; yet some things which have a vegetative power are discovered beneath the earth ; therefore some things discovered beneath the earth are not metals.

69.

Every real Christian is happy ; some real Christians are neither learned nor valiant ; hence some who are neither learned nor valiant are happy.

70.

Some innovations are productive of general benefit ; no change in the structure of the British constitution would be productive of general benefit ; consequently no change in the structure of the British constitution would be an innovation.

71.

No departure from the dictates of true wisdom can promote the public good ; some innovations can promote the public good ; some innovations are not departures from the dictates of true wisdom.

72.

Most of those who are much occupied in subterraneous occupations are unhealthy ; all miners are much occupied in subterraneous occupations ; therefore all miners are unhealthy.

73.

Nothing inconsistent with virtue can be ultimately beneficial either to states or to individuals ; lotteries

are inconsistent with virtue: therefore lotteries cannot be ultimately beneficial either to states or to individuals.

74.

Some well-meant endeavours are not consistent with judgment and prudence; yet all well-meant endeavours merit some degree of approbation; therefore some things which merit a degree of approbation are not consistent with judgment and prudence.

75.

All Christians believe the soul to be immortal; no Christians are Hindoos; therefore no Hindoos believe the soul to be immortal.

76.

All minerals are subterraneous productions; no subterraneous productions are animate beings; therefore no animate beings are minerals.

77.

All responsible beings lie under an obligation to a virtuous life; but the brute creation are not responsible beings; they consequently do not lie under that obligation.

78.

That style is best adapted to didactic writings which is most easily remembered; a concise style answers best to that description; and is in consequence best adapted to such writings.

79.

There are many vices which excite universal indignation; emulation however does not produce such an effect: whence it is evident that emulation is not a vice.

80.

No true philosopher can indulge in impatience and ill-will; Socrates, for instance, never gave way to these vices; therefore Socrates was a true philosopher.

81.

The specimens of the Doric order display an extremely simple style of architecture; the ruins of Stonehenge display an extremely simple style of architecture; therefore, the ruins of Stonehenge are specimens of the Doric order.

82.

All the fixed stars emit light from themselves; several of the heavenly bodies are not fixed stars; therefore several of the heavenly bodies do not emit light from themselves.

83.

Every thing liable to abuse should be carefully checked; some of our most useful and necessary appetites are liable to abuse; therefore some of our most useful and necessary appetites should be carefully checked.

84.

No human virtue is free from imperfection; some human virtues have effected great benefits for mankind; therefore some things which have effected great benefits for mankind are not free from imperfection.

85.

No affluence of fortune or elevation of rank exempts its possessor from the duties of application and industry; for industry is the law of our being; from which those accidents are insufficient to exempt any man.

PROMISCUOUS SYLLOGISMS

FOR EXERCISE.

SECOND SERIES.

Redundant or Defective Syllogisms.

1.

FAMILIARITY is productive of contempt, inasmuch as it occasions a needless exposure of private failings.

2.

The cause of evil (according to the French philosophers) is itself evil: religion (they likewise affirm) is the cause of evil; because it gives occasion to much violence, injustice, and bloodshed: therefore (they infer) religion is an evil.

3.

Correct writers avoid concluding their sentences with *particle*; (for a clause so constructed falls weakly on the ears;) but reviewers (since they are compelled to write with great rapidity) are frequently guilty of this fault: consequently they are often not correct writers.

4.

Discord is a greater vice than intemperance: for intemperance implicates but one person; but discord implicates more than one: and that vice which implicates the greater number of individuals is the greater vice.

5.

Discord is not a greater evil than intemperance: for that generally arises from the impulse of anger;

while the latter almost invariably proceeds from inveterate habit.

6.

They who are not conscious of guilt are not subject to fear : hence thieves are timid ; while pure spirits are exempt from any such sensation.

7.

Man should be restrained by laws, because he is an animal subject to selfishness, and other depraved passions.

8.

A young man, being inexperienced in the affairs of life, and too much under the influence of his passions, is not a fit student of moral philosophy.

9.

Sin is hateful, because it is opposed to the divine will.

10.

I think ; therefore I am. I am certain that I have existence, because I have the power of thinking.

11.

The study of mathematics so entirely engrosses the mind as to render the science interesting and delightful.

12.

It cannot be denied that classical studies are attended with much solid benefit, if it is duly considered what stores of useful knowledge are contained in many of the writings with which such studies render us acquainted.

13.

It is impossible that any thing should *be* and *not be* at the same time. Now whatever produces itself must *be* and *not be* at the same time : (for it is,

because it acts; and *is not*, because it is to be produced :) therefore it is impossible that any thing should produce itself.

14.

A pious woman makes a good parent; a good parent brings up her children virtuously; she who brings up her children virtuously is a useful member of society; a useful member of society is a blessing to a state; that which is a blessing to a state is a fit subject of public gratitude: therefore a pious woman is a fit subject of public gratitude.

15.

The inhabitants of St. Domingo cannot be enslaved; for how can such an event befall a people determined to die rather than to resign their liberty?

16.

A good face is a letter of recommendation; for it greatly prepossesses the beholders in favour of its owner.

17.

The proud man is most bitterly disappointed: he looks for honour, and receives only contempt.

18.

All the brute creation are guided in their actions by instinct, not by reason; consequently instinct and reason are different things.

19.

It is a certain sign of a bad heart to be inclined to defamation; for such an inclination arises from a neglect of what is laudable in a man's self, and an impatience of seeing it in another.

20.

Every thing which is new or uncommon raises a pleasure in the imagination, because it fills the soul with an agreeable surprise, gratifies its curiosity,

and gives it an idea of which it was not before possessed.

21.

Virtue has no tendency in itself to provoke others to jealousy; he who is provoked to jealousy by it shews himself possessed of a malignant spirit.

22.

The late war has thrown capital into new channels; whatever has this effect produces and extends various profitable branches of commerce: that which thus extends commerce employs capital to great advantage. The effect of this profitable employment of capital has been to raise up a vast population, supported by means which cannot be permanent. That which produces such an effect must ultimately, as experience proves, throw back that redundant population on the public in a state incapable to procure work. This state of things occasions the increase of poor rates, and the artificial mode of supplying through them the deficiency of wages. Such increase diminishes the proper value of property and the means of supporting the population. Hence relief is through necessity withheld from poverty. The continuance of that unrelieved poverty excites discontent; whatever excites discontent promotes a spirit of disaffection to government which is sure to be fostered by insidious demagogues. The whole then of the present distressing state of the country is to be traced back to the war as its cause and origin. (*Report of a speech in the House of Lords, Nov. 30, 1819.*)

23.

Sullæ et Cæsaris pecuniarum translatio a justis dominis ad alienos non debet liberalis videri. Nihil est enim liberale quod non idem justum. (*Cic. Off. i. 14.*)

24.

Θαυμασὸν ἔδεν ἔστιν
 . . . ἀνδάνειν αὐτοῖσιν αὐτοὺς καὶ δοκεῖν
 Καλῶς πεφυκέναι· καὶ γὰρ ἂ κύνων κυνὶ
 Κάλλιστον εἶμεν φαίνεται, καὶ βοῦς βοῖ,
 Ὅνος δ' ὄνω κάλλιστόν ἐστιν, ὅς δ' ὕψι.

(*Diogen. Laert. ex Epicharmo, iii. 16.*)

25.

A wise man is not surprised, because he is not disappointed; and he escapes disappointment because he never forms an expectation.

26.

No men are brutes; all brutes are irrational beings; all irrational beings are free from responsibility; therefore no men are free from responsibility.

27.

It was good policy in the Greeks to resist the subjugation of Egypt by the Persian monarchs, as calculated to endanger their own liberty; for Darius and Xerxes proceeded against Greece after their attacks upon Egypt. So that it was probable any future conqueror of Egypt would follow their example.

28.

Θιατὰ χρεὶ τὸν θιατὸν, ἐκ ἀθάνατα τὸν θιατὸν φρονεῖν.

29.

All human creatures are rational; all rational beings are responsible; some who are responsible violate duty; therefore some human creatures violate duty.

30.

Some learned men are vicious characters; all vicious characters are injurious to society; all such

deserve punishment; none who deserve punishment should be treated with honour; therefore some learned men should not be treated with honour.

31.

The whole Bible relates to Christ. It commences by displaying man's need of such a Saviour, and is closed with a promise of his second advent. The historical parts trace his descent as man, and contain many things emblematic of him. The ceremonial law typifies him; the moral law seals our ruin without him, and shews us how to testify our love towards him. The Prophets foretel all that relates to him and his church: the Gospels narrate his life: the Acts reveal the power of his grace in the establishment of his church: the Epistles afford the fullest disclosure of his doctrines: and the Revelation sets him forth as the eternal King. Thus Christ is the substance of the Bible.

32.

The inviolability of the divine promise requires that the Gentiles should be saved; the salvation of the Gentiles requires their calling on the name of the Lord; their calling on his name requires faith; faith requires the hearing of his word; the hearing of his word requires a preacher; a preacher requires a legitimate and divine mission: therefore the inviolability of the divine promise requires a legitimate and divine mission of preachers to the Gentiles. (*Rom. x. 13, 14, 15.*)

33.

The very true beginning of wisdom is the desire of discipline; and the care of discipline is love; and love is the keeping of her laws; and the giving heed unto her laws is the assurance of incorruption; and incorruption maketh us near to God:

therefore the desire of wisdom bringeth to a kingdom. (*Wisdom of Solomon*, vi. 17—20.)

34.

An acquaintance with conic sections has been of service in determining and measuring the periodical revolutions of the heavenly bodies; an acquaintance with the courses of the heavenly bodies has given a confidence to navigation; this confidence favours commerce; commerce facilitates exchange; the facility in carrying on an interchange of the productions of human labour encourages the activity of industry; activity and industry, when duly encouraged, render the productions of the earth more abundant; this abundance greatly augments the means of subsistence, (and consequently the population,) and removes privations; men love life and abhor privations: therefore the study of conic sections is useful. (*Fontenelle*.)

35.

It was said by the enemies of Themistocles, that it was not he, but his infant son, who governed the world; which they attempted to prove thus: The son of Themistocles governs his mother; his mother governs Themistocles; Themistocles governs the Athenians; the Athenians govern the Greeks; Greece governs Europe; Europe governs the world; therefore the son of Themistocles governs the world.

36.

Speech being the great bond which holds society together, and the common conduit whereby the improvements of knowledge are conveyed from one man and one generation to another; it well deserves our most serious thoughts to consider what remedies are to be found for the inconveniences arising from the abuse of words.

37.

Nunquam est utile peccare, quia semper est turpe: et quia semper est honestum virum bonum esse, semper est utile.

38.

Unjust and cruel man ! whoever thou art, whether French, or English, or German, who darest to maintain that we Africans are incapable of civilization;—take up the volume of history: read thine own origin: behold the manners of thy ancestors: trace what thou wast, and what thou now art:—and say, are the savage tribes of Africa to be compared for barbarity with those Gauls whom Tacitus and Cæsar have described as covered with the skins of beasts, wanderers and vagabonds in the midst of their forests, living on the prey obtained by hunting, and armed with clubs and arrows; maintaining their idolatrous druids and offering human sacrifices; burning their children in osier baskets as holocausts devoted to their god Theutates; deifying the misletoe; plundering without pity the wretched foreigners cast by shipwreck on their shores, and unsparingly cutting the throats of their prisoners of war? (*De Vastey, a native of Hayti: Revuë Encyclopédique, i. 534.*)

39.

Flattery is highly pernicious, especially to youth: for it originates in a base desire of interest, or in intellectual weakness; it retards improvement, paralyzes emulation, and extinguishes every motive to laudable exertion.

40.

The origin of anger is pride; and who can estimate the evil of that which flows from such a poisoned source?

41.

There is no wisdom but from genius ; there is no genius but from experience ; there is no experience but from practice ; there is no practice but from exertion ; there is no exertion but impulse ; there is no impulse but from choice ; there is no choice but from love ; there is no love but from discretion ; there is no discretion but from consideration ; there is no consideration but from virtue ; therefore there is no wisdom but from virtue.

42.

They who brook it worst that men should tell them of their duties, when they are told of the same by a law think very well and reasonably of it. And why? Because they presume that the law speaks with impartiality ; that the law has no respect of persons ; that the law is as it were an oracle proceeding from wisdom and understanding.

43.

Examples of ingratitude check and discourage voluntary beneficence ; and this affords one cogent reason to prove the mischief of ingratitude.

44.

Happiness does not consist in an exemption from pain, labour, care, business, suspense, molestation, and other external evils ; such a state being usually attended, not with ease, but with depression of spirits, a tastelessness in all our ideas, imaginary anxieties, and the whole train of hypochondriacal affections.

45.

Books, says Bacon, can never teach the use of books. For the student must learn by commerce with mankind to reduce his speculations to practice, and accommodate his knowledge to the purposes of life.

F f

46.

Iterations are commonly loss of time : but there is no such gain of time as to iterate often the state of the question ; for it chaseth away many a frivolous speech as it cometh forth.

47.

Cavenda est gloriæ cupiditas, eripit enim libertatem, pro quâ magnanimis viris omnis debet esse contentio.

48.

Frugality is so necessary to the happiness of the world, so beneficial in its various forms to every rank of men, from the highest of human potentates to the lowest labourer or artificer ; and the miseries which the neglect of it produces are so numerous and so grievous, that it ought to be recommended with every variation of address and adapted to every class of understanding.

PROMISCUOUS SYLLOGISMS

FOR EXERCISE.



THIRD SERIES.

Hypothetical Syllogisms.

1.

IF fire may be separated from a flint, then a property may be separated from its subject; but fire may be separated from a flint; therefore a property may be separated from its subject.

2.

If hatred and malice are contrary to the divine law, they ought to be avoided; but that they are so is too evident to be denied; they ought therefore to be undoubtedly avoided.

3.

If the exercise of war in defence of our country were sinful, it would either expressly or by implication be forbidden in the Scripture; but this is not the case; and consequently we infer safely that it is not sinful.

4.

On important business it is proper to consult with others; for if a man be wise and experienced, he is sensible that two heads are better than one; and if he be an idiot, he should endeavour to make up his deficiency by the wisdom of others.

5.

The virtues are either passions, faculties, or habits: they are not passions; for passions do not

depend on previous determination : nor are they faculties ; for we possess faculties by nature : therefore they are habits.

6.

Every man should render himself agreeable to those with whom he is in company : for if he is their superior in rank and fortune, it becomes him to shew himself their superior also in politeness ; if he is their equal, he should remember that all have an equal right to be pleased, and that he cannot expect to receive the civilities he does not give ; and if he is in company with his superiors, he should avoid either offending them by an unreserved freedom of manners, or rendering them uneasy by a foolish bashfulness.

7.

If w is a vowel, it can be sounded by itself ; but it cannot ; which is sufficient proof that it is no vowel.

8.

If government lotteries promote the dangerous spirit of gambling, hold out temptations to idleness and extravagance, and unsettle the minds of those, in the lower orders especially, who would otherwise be industrious and useful members of the community ; then those lotteries ought to be wholly abolished by a wise and Christian legislature. Now it cannot, even by their warmest supporters, be denied that such are their natural effects ; and therefore *they* are by no means too severe who represent them as wholly deserving to be abolished by a wise and Christian legislature.

9.

If baptism could be justly refused to the children of Christian parents, circumcision should on the same principle have been refused to the offspring of Jewish parents. But the express command of

God proves that such refusal among the Jews would have been sinful. How then can it be thought less criminal to withhold from the children of Christians their initiatory rite, and thus to rob them of an invaluable privilege which is clearly their due.

10.

“The baptism of John, was it from heaven or of men?” “If we shall say, From heaven, he will say, Why then believed ye him not? But if we say, Of men, all the people will stone us; for they be persuaded that John was a prophet.” (*St. Luke xx. 4—6.*)

11.

If the gas-lights emit a disagreeable smell, a sufficient reason is afforded for objecting to them; but they do not emit a disagreeable smell; therefore no such sufficient reason is afforded.

12.

O sententiam necessitate confusam! negat inquirendos ut innocentes, et mandat puniendos ut nocentes; parcat et sævit, dissimulat et animadvertit! Quid temetipsum censurâ circumvenis? si damnas, cur non et inquiris? si non inquiris, cur non et absolvis? (*Tertullian to the Emperor Trajan, who forbid that the Christians should be sought out, yet ordered that they should be punished when found.*)

13.

A general systematic reformation of the House of Commons must be of one of two sorts. It may be a restoration, upon the original principles of the institution to be reformed, to the state in which it stood at some former time, and from which it is alleged to have degenerated: or, it may be a reconstruction of the institution on principles alto-

gether new. My first question to the proposer of such general reformation, therefore, is, Which of these two modes have you in view? If the answer be, Restoration to what the House of Commons was in former times; I then request that the period may be specified at which the House of Commons was, according to the reformer, in the perfection to which he wishes to restore it. If, on the other hand, the answer be, that it is intended to re-construct the House on new principles: then, I think, it is not too much to ask that these principles be clearly defined, before we are required to take a single practical step towards the abolition of the existing frame of the House of Commons. (*Report of a Speech in the House of Commons, Nov. 24, 1819.*)

14.

If the indulgence of an angry spirit renders us the scorn and sport of all about us; if it betrays us into irretrievable misconduct; if it occasions the forfeiture of the esteem of those friends whom we have most highly valued; if it becomes, on many accounts, the source of numerous and deep regrets; surely that disposition ought by every effort to be resisted and subdued.

15.

If benevolence were the whole of virtue, then in the review of our own character or that of others, our moral understanding and moral sense would be indifferent to every thing but the degrees in which benevolence prevailed; but this is far from being the case; for an act of injustice or treachery, though it should originate in a desire to benefit others, is still felt to be vicious and unjustifiable. Consequently virtue is by no means resolvable into benevolence.

16.

The sun and the earth are both spherical bodies. If therefore they were equal in size, the shadow of the earth would be cylindrical, and extend *ad infinitum*. But if so, Mars, and the other superior planets would be eclipsed by it. But this is never the case : therefore the sun and the earth are not of equal size. Again, if the earth were larger than the sun, its shadow would increase in width in proportion to its distance, and thus would occasionally eclipse the superior planets. But the earth never eclipses them : therefore it is not larger than the sun. But the earth was before proved not to be equal to the sun : therefore it is smaller than the sun.

17.

It is not easy to comprehend what could have induced an impostor to forge two such Epistles as the second and third attributed to St. John. They could not have been forged during that Apostle's life ; for the imposture must have been immediately detected : and if they had been forged after his death, it is not very probable that the impostor would have made his pretended author promise at the end of each Epistle that he would shortly pay a visit to those to whom the Epistles were addressed.

18.

Τούτους ἂν τοὺς ἄνδρας (τοὺς Ἰωνᾶς) συμβουλέω τοι μηδεμίῃ μηχανῇ ἄγειν ἐπὶ τοὺς πατέρας· καὶ γὰρ ἄνευ τούτων οἰοί τε εἶμιν τῶν ἐχθρῶν κατυπέριτοι γίνεσθαι. Ἡ γὰρ σφέας, ἣν ἔπανται, δεῖ ἀδικωτάτους γίνεσθαι, καταδουλουμένους τὴν μητρόπολιν, ἢ δικαιοτάτους συνελευθεροῦντας. Ἀδικώτατοι μὲν νυν γινόμενοι, οὐδὲν κέρδος μέγα ἡμῖν προσβάλλουσι· δικαιοτάτοι δὲ γινόμενοι, οἰοί τε δηλῆσασθαι μεγάλως τὴν σὴν στρατιὴν γίνονται. (*Artabanus to Xerxes, Herod. vii. 51.*)

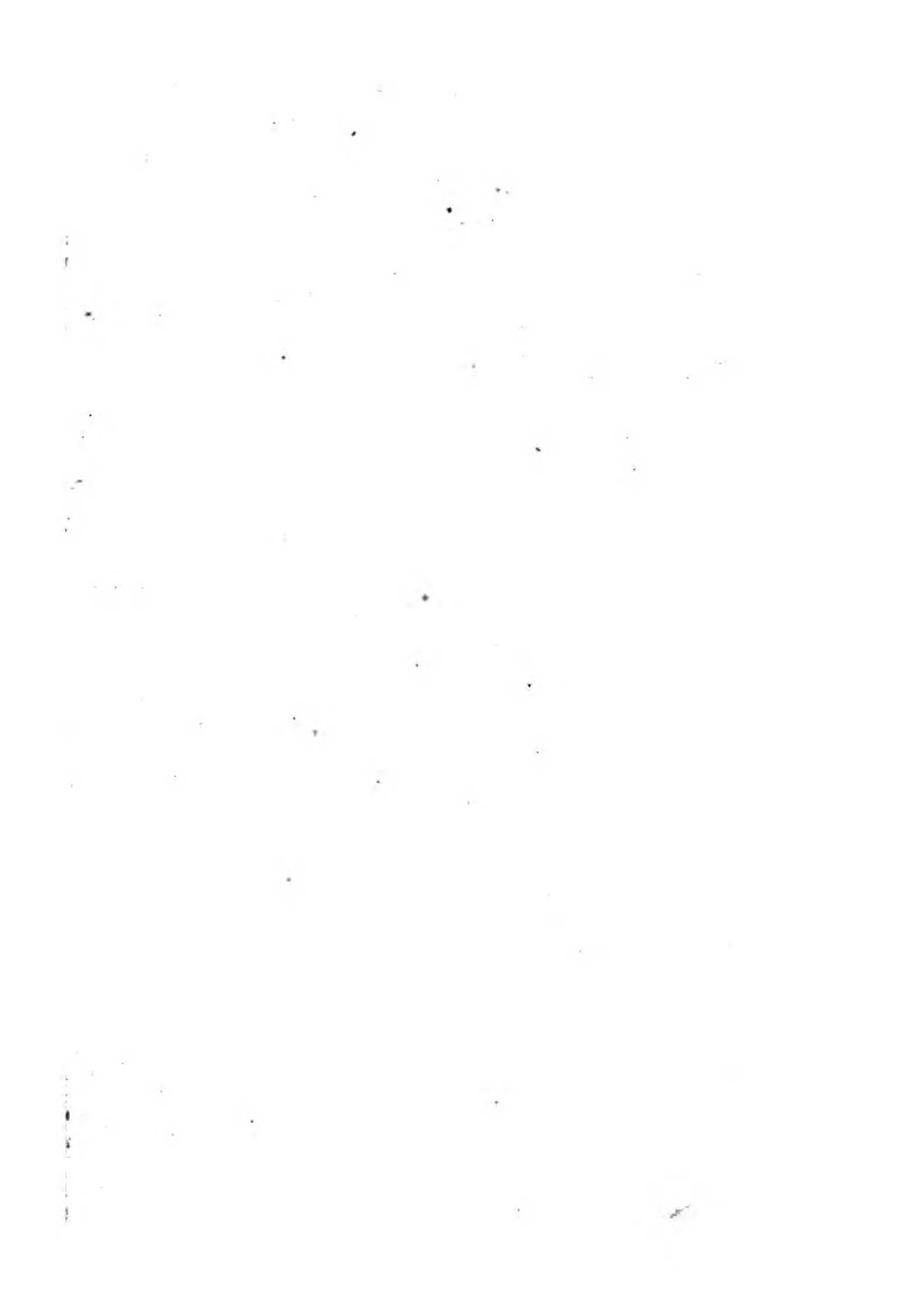
19.

The odes of Horace were composed either by him or by some ingenious monk who intended to personate him. But for this latter hypothesis there is no authority, nor does any circumstance afford it an appearance of probability. On the contrary no writer subsequent to the Augustan age could have maintained so great purity of Latin style; besides which, the allusions are all Roman, nor do they bear any semblance of that allegorical character which some have ascribed to them. Therefore they must have been the productions of him to whom they have been usually attributed.

20.

“ Utilis est,” inquis, “ ira ; quia contemptum effugit.” Primum, ira si quantum minatur valet, ob hoc ipsum quod terribile est, et invisa est. Periculosius est autem timeri, quam despici. Si vero sine viribus est, magis exposita contemptui est, et derisum non effugit. Quid enim est iracundiâ in supervacuum tumultuante frigidius ? (*Seneca.*)

THE END.





12

