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STONYHURST PHILOSOPHICAL SERIES

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# LOGIC

BY

RICHARD F. CLARKE, S.J.

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# PREFACE.

WHEN Scholastic Philosophy ceased to be the subject of systematic study in Protestant Universities, and was regarded as possessing an historical rather than a scientific interest, there was one branch of it that was treated with less dishonour than the rest. In Ethics and Metaphysics, in Psychology and Natural Theology, the principles handed down by a tradition unbroken for centuries came to be looked upon as antique curiosities, or as merely illustrating the development of human progress and human thought. These sciences were either set aside as things of the past, consisting of fine-spun subtleties of no practical value, or else they were reconstructed on an entirely new basis. But with Logic it was different. Its underlying principles and its received method were not so closely and obviously interlaced with the discarded system of theology. It admitted

of being more easily brought into apparent harmony with the doctrines of the Reformation, because it had not the same direct bearing on Catholic dogma. It was, moreover, far less formidable to the ordinary student. Those who had no stomach for the Science of Being, were nevertheless quite able to acquire a certain moderate acquaintance with the Science and the Laws of Thought. Men chopped Logic harmlessly, and the Logic they chopped was the traditional Logic of the Schoolmen, with some slight modifications. The text-book of Dean Aldrich, which has not yet disappeared from Oxford, is mediæval in its phraseology and its method; mediæval, too, in its principles, except where an occasional inconsistency has crept in unawares from the new learning. It still talks of "second intentions," and assumes the existence of an Infima Species, and has throughout the wholesome flavour of the moderate realism of sound philosophy.

But this state of things could not last. Sir W. Hamilton, the champion of conceptualism, put forth in his Lectures on Logic a theory of intellectual apprehension quite inconsistent with the traditional doctrine which still lingered in the meagre and obscure phraseology of Dean Aldrich. Sir W. Hamilton's disciple, Dean Mansel, who

carried on the work of philosophic scepticism which his master had inaugurated, published an edition of Aldrich, with explanatory notes and appendices, which pointed out his supposed errors, while John Stuart Mill, with far more ability and a wider grasp than either of the two just named, substituted for the halting conceptualism of Hamilton a nominalism which had but a thin veil of plausible fallacies to hide from mankind the utter scepticism which lay beneath it.

Since then, the Kantian principle of antinomies which underlies the Logic of Mansel and Hamilton has boldly come to the front in England under the shadow of the great name of Hegel, and English logicians have either ranged themselves under the banner of one or other of these new schools, or else have sought to cover the glaring inconsistencies of some one of them with patches borrowed from the others, until the modern student has a bewildering choice among a series of guides, each of whom follows a path of his own, leading in the end to obscurity and confusion and self-contradiction, but who are all united in this, that they discard and misrepresent the traditional teaching of Aristotle and of the mediæval logicians. Their facility in so doing is partly owing to the fact that Aristotle has no methodical treatise cover-

ing the ground of modern Logic, and St. Thomas gives merely a rapid sketch of the technical part of it in one of his Opuscula. But from the pages of the great philosopher of Pagan times and of the Angelic Doctor of the middle ages, can be gathered by the careful student all the principles necessary for the modern logician. Every Catholic teacher of Logic follows of necessity closely in their steps, and finds in them the solution of every difficulty, and the treatment—at least the incidental treatment—of almost every question that Logic can propose.

The modern school of Logic departs from the ancient from the very first, as the reader will see as he studies the following pages. The very foundations are different. The Principle of Contradiction is in the Hamiltonian system subordinated to that of Identity, while Stuart Mill goes still further astray, and the Hegelians set it altogether aside. The account given by these various schools of the process of intellectual apprehension by which the idea or general notion is arrived at, is one which leads to an utter scepticism. The Doctrine of the relativity of human knowledge is no less at variance with all positive truth, while the modern theory of Universals attempts to establish itself on the ruins of the Scholastic Realism by a gross misrepre-

sentation of what Scholastic Realism really means.

It is the object of the present Manual of Logic to lead back the English student into the safe paths of the ancient wisdom, to point out where it is that the speculations of modern philosophizers have quitted the well-trodden high road of truth, and to at least indicate the precipices of inconsistency and self-contradiction to which they conduct the unhappy learner who allows himself to be guided by them. It is, however, impossible, in a compendious text-book like this, to discuss at length the various ramifications of the errors through which the different schools of to-day have gone utterly astray. It has therefore been the aim of the writer to select for attack, as far as possible, the central and distinctive error of each, or the one most likely to throw dust in the eyes of the incautious reader from the very beginning.

This, however, is not the primary object aimed at. The need of a Catholic text-book of Logic in English, corresponding to those which are in general use in Protestant schools and Universities, has been long felt on both sides of the Atlantic. To the more advanced students of our Catholic Colleges a thorough grounding in Logic is a most important element in their intellectual cultivation. Yet there

has been hitherto no text-book which could be put into their hands for the purposes of private study. The Latin treatises which form the basis of the lectures attended by the young ecclesiastic are quite unsuited for them, apart from the mere difficulties of the language. Their strange phraseology, the technicalities of their style, the cut and dried method they pursue in their advance from principles to conclusions, their complete severance from modern habits of thought and speech, render them unintelligible to ordinary students without an elaborate explanation on the part of the teacher. He has to cover the dry bones with flesh, to enlarge, illustrate, translate, and simplify, and often entirely reconstruct, before he can reach the average intelligence or rouse any interest in his pupils.

The English text-books hitherto issued have been little more than a literal translation from the Latin, and though they have done a good work in furnishing students unversed in Latin with text-books in their own language, yet they have not attempted the further task of translating scholastic into nineteenth-century phraseology. It is hoped that the present Manual may put before our Catholic youth this most important branch of study in a more simple and attractive form. The scholastic

terms have not been discarded, but they have been carefully explained and rendered into words which will convey to the man of average education their real meaning. While the scholastic system has been closely adhered to throughout, the dress in which it is clothed is modern, and no previous knowledge is necessary for the young Catholic in whose hands it is placed.

There is another class to whom it is hoped that the present text-book may prove useful. Many a Protestant student, perplexed and bewildered by the rival claims of half a dozen different systems, each at variance with the rest, and often also at variance with itself as well, is inclined to give up the search for truth in despair and to fall back on the Hamiltonian doctrine of the Relativity of Knowledge, or in other words, on the non-existence of truth at all. Such a one often craves in his heart after some leader on whom he can rely, some one who represents, not the newly-fangled inventions of the individual, but the traditional authority of centuries. He would fain know whether amid Catholic philosophers there is the same discord and the same contradiction as among Protestants, and would eagerly drink in the teaching of one who speaks, not in his own name or that of some modern theorizer, but in the name of the men of

genius, who gave themselves to the study of Logic from the days of Aristotle till the unhappy period when the old learning was discarded with contempt by the ignorance of the Reformers. To any such inquirer this text-book offers the ordinary Catholic teaching grounded on Aristotle and set forth by St. Thomas of Aquin, which flourishes as vigorously as ever in every centre of higher Catholic education. If there is any departure from the doctrines of St. Thomas in these pages, it is there without the knowledge of their writer, whose object it has been to follow throughout in the footsteps of the Angelic Doctor.

There is another class to whom such a text-book as this will be a real boon, to whose existence the writer can testify from personal experience. Converts to the Catholic Church, trained in the English Colleges and Universities, have unconsciously drunk in a number of principles, some true, some false, from their earliest years, and are often not a little puzzled to discern the true from the false. Perhaps in their early days Hamilton and Jevons, Mansel or Veitch, had represented to them the orthodox school, and Mill and Spencer and Hegel a more consistent and at the same time more sceptical system. On submission to the Church, they would know how far these rival claimants possess any

fragments, large or small, of solid truth, and where they each and all wander away into error. In the following pages this need has been kept in view, and the Author has sought to write what would have been useful to himself twenty years ago, when he made unsuccessful endeavours to master by private study the principles of Catholic philosophy from inscrutable Latin text-books.

Last of all we must remember that in these days the old ideas respecting the limits of feminine education have been not a little modified. This is not the place to discuss the advantages and disadvantages of a more enlarged intellectual training for women. It is enough to say that the change which is being introduced is in many respects only a re-assertion of what was common enough in Catholic times. It is an undoubted gain to the cause of Truth that women of cultivated tastes should be trained to think correctly, and should have such a knowledge of the principles of Logic as may help them thereto. In Convent schools and other Catholic institutions the higher education is steadily making way, especially in the United States, and the study of Logic is an important element in it. The present volume is one which, even if it is not put into the hands of the younger students, is well suited for the

Teacher's use in the instruction of her Catholic pupils, as well as for those whose general training may give them an interest in the subject and a desire to investigate it for themselves.

One word to those who may desire to know the best order in which to study the various parts of Catholic Philosophy. Although this Text-book of Logic has not been the first to appear in order of time, it is the one which naturally comes first in order of thought, and the Student is recommended to pass from it to the Text-book of First Principles, and so on to Ethics, Natural Theology, Psychology, and the difficult though important subject of General Metaphysics.

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# LOGIC.

## PART I.

## CHAPTER I.

### THE PROVINCE OF LOGIC.

**Importance of Logic—Aim of Logic—Meaning of the word—Logic and Grammar—Logic in its relation to Thought—Different meanings of Thought—Logic and Psychology—Logic and Metaphysics—Formal and Material Logic, and their respective provinces—Formal Logic necessary to Material—Meaning of Formal Logic—The Laws of Thought—Logic in its relation to the Laws of Thought.**

THE importance of the study of Logic is derived from its undeniable claim to an universal dominion over the minds of men. No one can ever think correctly unless he thinks logically. No one can judge aright unless his judgment is one which Logic can approve. No one can arrive at well-grounded conclusions unless he argues in conformity with the laws of Logic. He who professes a system of Philosophy, or Theology, or Science which is in any respect opposed to logical principles, thereby declares his system to be false and irrational, and himself an intellectual impostor. Logic must of necessity control with its unerring laws every process of thought, every act of judgment, every chain

of argument; else the process of thought is faulty, the act of judgment unwarrantable, the chain of argument incorrect.

The ultimate end aimed at in the study of Logic is to train the human mind to *exactness* of thought. It is not to make a man ready in argument, nor to add to the stock of human knowledge, but to teach us to think correctly. As in a liberal education the end aimed at is not to impart to the student a vast number of accumulated facts, but to stimulate the desire for acquiring information for himself, to furnish him with the means of doing so, and to enable him to make a good use of the information when acquired, so the ultimate object of the study of Logic is not so much to supply us with a detailed analysis of our processes of thought, as to ensure their correct performance. This is the end it has in view in laying down the Laws of Thought which are its foundation, and in analyzing the various operations which fall within its province. This it aims at still more directly in pointing out the manifold dangers to which thinking is exposed, and the fallacies by which the thinker is most liable to be deceived. It seeks to arm the logical student *cap-à-pie*, so that he may be able to detect at a glance the incorrect judgment or unwarranted assumption. It gives him the clue to the carefully concealed fallacy, and enables him to expose its weakness, to show where the inference is faulty, or where the terms are used in an ambiguous sense, or where statements are put forward as identical when they are really different from each other.

But what is Logic? Before we consider this question, we will look at the origin of the word, as an useful guide to its true meaning.

Logic is derived from the Greek *Logos*, which has the double meaning of *word* and *thought*. It is used in classic authors indiscriminately for the *internal word* present in the mind, and the *external word* uttered by the lips. It has, therefore, no exact equivalent in English, although in theological language *word* is sometimes used for that which is hidden in the intellect without finding external expression.[1] But such usage is exceptional, and in ordinary English *word* implies some form of spoken language.

The double use of the Greek word *Logos* corresponds to the double nature of the subject-matter of Logic. As Logos is primarily the internal thought, and secondarily the external expression of the thought, so Logic is primarily concerned with thought, secondarily with language, as expressing thought. The connection between correct thought and correct language is so intimate, that any branch of knowledge which treats of the one must to some extent include the other. Logic, therefore, as being concerned with thought, is necessarily concerned also with language. Here we see its relation to Grammar. Both Logic and Grammar have to do

[1] Thus *The Word* is used to express the Second Person of the Blessed Trinity, the Eternal Wisdom of God, hidden in the Intellect of the Eternal Father before all ages ("The Word was made Flesh"), and also the interior voice speaking with Divine authority to the mind of the prophets ("The word of the Lord came to Jonas," &c.).

with thought and language, but Logic has to do with thought primarily and essentially, and with language secondarily, and only so far as it affects thought, whereas Grammar, on the other hand, treats of language primarily and essentially, and of thought only secondarily, and so far as is necessary for the due treatment of language.

Logic then is a branch of knowledge concerned with Thought. But this is not sufficient for our Definition. What do we mean by Thought? Has Logic to do with all our thoughts? Does it include an investigation into the origin of Thought, the subject-matter of Thought, the various mental processes which are connected with Thought? Does it treat of Thought in general, or is it limited to some special province or department of Thought?

In order to have an accurate knowledge of the province of Logic, we must first of all have an accurate knowledge of Thought. Thought is used in two different senses.

1. It is sometimes used to include every mental process, every activity of those faculties which belong to the sphere of intelligent (as distinguished from intellectual) life. Thus I say that my friend in Australia is in my *thoughts*, and by this I mean that he is present in my memory, and his image dwells in my imaginative faculty. A child is said to be *thinking* of its dinner, when we see it restless and fidgetty in the school-room as the time of its mid-day meal approaches, and we mean thereby that a vague, half-conscious recollection of the expected food, and a desire to partake of it, is present to its

mind. In this sense animals may be said to *think*. The dog *thinks* of the rat when his master makes a scratching noise in the corner of the room; he *thinks* of the pain of some recent castigation when he sees the whip. *Thinking*, in this meaning of the word, belongs to the material faculties of memory and imagination, as well as to the immaterial faculty of intellect.[1]

2. *Thought* is also used in the narrower and stricter sense of the exercise of our intellectual faculties properly so called, of that immaterial faculty which brings within the range of our knowledge things above and beyond sense, which recognizes in things sensible that which is suprasensible, and contemplates under the external appearance the underlying nature. It is the recognition in things around of that which makes them to be what they are, of the inner reality hidden under the shell of the external and material object of sense, of that which in scholastic language is termed the *essence*, or *quiddity*, because it answers the question,[2] What is this? *Quid est hoc?* Thought is the grasping of that common nature which is the foundation of all classification, and binds together existing things

[1] When thought is used in this sense, it is true that in the case of rational beings there is a real intellectual apprehension, since this necessarily accompanies every act of their imagination. But it is the sensitive act of which we are speaking when we use in reference to such acts the word *think*, since we employ it in the same sense of the acts of men and of the lower animals.

[2] *Quidditas* is the somewhat barbarous but very expressive equivalent of the Aristotelian phrase, τὸ τί ἦν εἶναι. The essence or quiddity of a thing consists in its corresponding to the pattern

into what we call classes, or kinds, or species. It is the apprehension of things immaterial and spiritual, and of things material only after its own immaterial fashion.

But it is more than this. It also includes those processes by which the intellect compares together the ideas which it has framed for itself from objects about and around us, pronounces on their agreement or disagreement, declares them to be compatible or incompatible, identical or different from each other. The decisions thus arrived at it places side by side, and from them passes to further propositions deducible from them, comparing these together in their turn, and thus constructing arguments and chains of argument with an activity of which the only limit is the finite character of Thought. In other words, Thought apprehends, judges, reasons, not about individual objects, apprehended directly and immediately as individuals, not about sensible things in their capacity of objects of sense, but about the inner nature which underlies all things, whether sensible or suprasensible, material or spiritual, and which intellect alone can grasp and make its own.

Animals therefore are incapable of Thought in this higher sense. Their knowledge is limited to things sensible and material, and that which is essentially dependent on sense and matter. They have no capacity for apprehending the inner nature

after which it was fashioned. Hence τί ἦν = what is its nature? what was it intended to be by its Creator? And therefore τὸ τί ἦν εἶναι = the being what it was intended to be by its Creator.

of things. Animals can form a sort of judgment, it is true, about things of sense, and act in consequence of sensible impressions, as if they drew a conclusion from such judgments, in a way that often strangely counterfeits intellectual activity, but they never get beyond the region of sense, and exercise their faculties on objects which admit of being painted on the Imagination, not on those which belong to the special province of Intellect.

But is Logic concerned with all that concerns Thought? with the processes, for instance, by which materials are supplied to the intellect for it to think about? or with the various phenomena of Thought that observation and experience reveal to us? Is it concerned with the reliance to be placed on our thoughts, and their correspondence with the things about which we think? Does an investigation into the various faculties of the mind that think, and of their mutual relation to each other, lie within the scope of Logic? While we contend for all reasonable liberty in defining the domain of Logic, we must be careful not to encroach on kindred sciences.

Logic is not concerned with an analysis of our thinking faculties. This belongs to Psychology, or the science of life, of intellectual life, as well as of its lower manifestations. To Psychology, moreover, belongs the study of the various phenomena of thought, of the facts of intellect that we gain by observation. To Psychology belongs the analysis of the processes previous to Thought, by which materials are furnished to the Intellect. To Psy-

chology belongs the determination of the exact distinction between the sensitive and the non-sensitive faculties of the mind, and of their mutual dependence on each other, and though the two sciences have a certain amount of common ground, yet we may say in general that Psychology is concerned with all the operations of *mind* in its widest sense, while Logic is concerned only with those which contribute to correct thinking.

Nor is Logic concerned with the objects about which we think, except in so far as they are represented in the thinking mind. Regarded in themselves they fall under the domain of Metaphysics, which investigates the inner nature of things, and regards them as in themselves they are. The science of Metaphysics determines the nature of various forms of *being*, of essence and substance, of cause and effect, of goodness, unity, and truth. It treats of that which lies outside the mind, and contemplates it in its objective reality. Logic, on the other hand, treats of that which is within the mind only, and contemplates it in so far as it is a part of the intellectual furniture.

But is it within the province of Logic to decide on the reliance to be placed on our thoughts, or their trustworthiness as representations of the internal objects about which we think? Here we come on an important distinction between the two parts of Logic.

1. *Formal* Logic has a limited, though a most important province. Its jurisdiction is confined to those thoughts which already exist within the mind

and have passed the barrier between intellect and sense. It has to take for granted that the processes by which they have been received were correctly performed. It accepts such thoughts as the materials it has to employ, it pronounces on their character as thus received, on their various relations to each other, whether of inclusion or exclusion, compatibility or incompatibility, and from the decisions passed it passes on to other decisions, compares one with another and pronounces some fresh decision as the result of the comparison. It discusses the ideas which are the objects of thought, and the judgments which express their mutual relation, and the arguments which result from combined judgments. Furthermore, as *ideas*, *judgments*, *arguments*, must all be expressed in words, it treats of *terms* as expressing *ideas*, *propositions* as expressing *judgments*, *syllogisms* as expressing *arguments*.

2. *Material* or *Applied* Logic includes a much wider province. It is not satisfied with taking its materials for granted, but examines into the processes by which those materials are brought into the mind, so far as is necessary to their being correctly performed. It includes the consideration of the correspondence of the object of thought as it exists in itself and as it exists in the thinking mind. It pronounces on the nature of *evidence*, on the various degrees of *certitude* from absolute ignorance to the highest possible assurance of truth: on the various grounds of certitude: on the distinctions of doubt, opinion, knowledge, faith, on the necessity of some kind of certitude if we are to think at all, and

of the consequent folly of universal scepticism. It acts the part of critic and investigator of truth, and its investigations carry it outside the limits of the *thinking* process properly so called, in order that it may defend this process against the dangers to which it is exposed from without.

In the present volume we shall confine ourselves, though not with the rigour of too close an exactitude, to Formal Logic. Material Logic is rather a part of Fundamental Philosophy, and would lead us too far afield. Yet we shall find it necessary to speak of certain processes which strictly speaking lie outside Formal Logic on account of the confusion that has been introduced by the speculations of various modern authors, who make it necessary for us from time to time to make excursions outside our own proper province in order to keep its limits intact, and beat our opponents back when they seek to bring confusion into the realm of Logic Pure.

Formal Logic is moreover the ally and the most useful ally of Material Logic. Although it takes its materials for granted, yet indirectly it detects error admitted from without. For as we derive our thoughts and our judgments from countless different sources, any error existing in the mind is sure to find itself sooner or later at variance with some truth which is already settled there. Formal Logic detects the inconsistency and declares that the intruder must be driven forth. There cannot be harmony in the soul as long as error remains there; and Formal Logic detects the jarring note. It leaves indeed to Applied Logic the task of watching

at the gate and demanding the passport of propositions which demand admission into the mind, but it exercises a vigilant surveillance over those already within. Besides this, it has at its service a body of efficient auxiliaries in the shape of necessary truths which do not come from without at all (except so far as external things are the occasion of their birth), but are the citizens who are born within the thinking mind. They are the ready instruments of Formal Logic, and as they can never be driven out unless absolute anarchy prevails, they are most useful in thrusting forth the stranger who is not furnished with a passport, however plausible and fairspoken he may be. There are, in truth, very few errors (and those are errors of fact and not of principle) which Formal Logic does not supply the means of detecting and expelling from the mind.

But what is the meaning of Formal Logic? It is that part of Logic which deals with the *forms* according to which all correct thought proceeds with the *laws* which regulate thought, the universal and irrefragable rules which must govern every act of thinking, if it is to be correct. Formal Logic supposes its materials already received and transformed into the intellectual *pabulum* suitable for its own use. In using these materials the intellect, from the necessity of its rational nature, has certain fixed and unchangeable conditions under which it thinks. It is from an analysis of these conditions, from an investigation of its normal method of procedure that the laws which govern the intellect are ascertained, and it is the business of

Formal Logic to enunciate these laws, to enforce their observance on every thinker and to allow no sort of deviation, even by a single hair's-breadth from their enactments. It has to proclaim these laws eternal and immutable as God Himself, and to pronounce its anathema on all who declare that they admit of any exception under any circumstances whatever. From the beginning to the end of time, nay before Time was and after Time shall be no more, in any conceivable world which God has created or could create, these laws are unchangeable and inviolable, and God Himself cannot interfere with them in their very smallest detail. For they are the foundation of all Truth and are themselves founded upon the nature of the God of Truth. God could not violate them without ceasing to be God, and man cannot violate them without violating that rational nature which he possesses in virtue of his creation in the likeness of God.

Logic, therefore, in the sense in which we are using it, is concerned with the *Laws of Thought*. But not with all the laws which may be termed laws of thought. For the expression admits of two different meanings. A Law of Thought may be a law which regulates the relation of thought to the outside world, and ensures the correspondence of the *thought* to the objects thought of. Such a law would be a *material* Law of Thought. For instance, after a certain amount of careful observation and research, I feel myself justified in laying down the proposition: *All tortoises are slow in their movements*, and I apply to the logician to know whether I am

conforming to the laws of correct thinking in the process which has led me to this conclusion. The law about which I ask is a law which has to decide the amount and the nature of the internal investigation which justifies me in uniting together in one judgment the idea of tortoise and the idea of slowness of movement. It is a law regulating the acceptance of the materials of thought. It involves external research, and cannot be arrived at by a mere comparison of the two ideas. It is therefore a *material* law, and Formal Logic cannot pronounce upon it. It is not a law of Thought itself as Thought. It is not a law which may be known independently of any reference to things outside. It belongs to Material Logic to pronounce whether I have fulfilled the conditions requisite to ensure certitude in the assertion of the proposition in question.

But if I submit to the logician the proposition, *All spirits are immaterial beings*, and ask him whether I am safe in asserting it, he as a formal logician can answer me at once. The process by which that proposition is arrived at needs no outside investigation. It involves nothing more than a comparison of the thought or idea of *spirit* and the thought or idea of *immaterial being*. *Spirit* implies *immaterial*, and the process of comparison which leads me to combine the two in my judgment is a process of Formal Logic strictly so called. The law which regulates the process is a *formal*, not a *material* law, a law which is entirely independent of external observation and research, a law which follows from the nature of Thought as Thought.

Hence Logic is concerned with the *Formal Laws of Thought*, with the Laws of *Thought as Thought*, with the laws which concern Thought alone, in and by itself.

Even when thus restricted the field of Logic is sufficiently wide. Its sway extends over all our thoughts. It has a word to say to us whenever we think. It sits on its tribunal on every occasion on which our intellect performs any intellectual operation whatever. Even though Formal Logic disclaim any interference with the introduction of materials from outside into the thinking mind, or with the faculties which supply those materials, or with the nature of the mind itself which thinks, still it is true to say that we cannot think a thought without Logic having a control over it. This is why we begin the study of Philosophy with Formal Logic, for unless it stamp its approval on our mind's work, that work all counts for nothing. If Logic can show a flaw in our thinking process, if it can point out a single idea inconsistent with itself, or a judgment in which subject and predicate are incompatible, or a conclusion at variance with the premisses or which does not follow from them, the whole argument has to be put aside as valueless, until it has conformed to the ruthless and inflexible laws of Formal Logic.

# CHAPTER II.

## THE DEFINITION OF LOGIC.

Summary of preceding Chapter—Is Logic an Art or Science, —Distinction of Art and Science—Science learned by Study? Art by practice—The Laws of Science immutable—Art mutable—Science concerned with what already exists, Art with production—Application of this to Logic—Logic primarily a Science, secondarily an Art—Is the Science of Logic speculative or practical?—Distinctions between them—Logic both speculative and practical—Various Definitions of Logic, (1) Archbishop Whately, (2) Arnauld, (3) Port Royal, (4) J. S. Mill, (5) Arabian Logicians—History of the Name of Logic.

BEFORE we proceed with our Definition of Logic, we must sum up the work done hitherto. The all-important end at which Logic aims is exactness of Thought. Logic is concerned with Thought, by which we mean not every mental process, but the operations of intellect and none other. These operations fall under three heads, the consideration of which furnishes the three divisions of a text-book on Logic. Logic, however, is not concerned with an analysis of our thinking faculties, or with the mental processes which necessarily accompany Thought, nor with the external objects about which we think, but only with that which is immediately

necessary to correct thinking. It therefore has to deal, (1) with those operations of the Human Intellect which take for granted the correctness of the materials supplied from without, and regulate the disposal and development of those materials (*Formal Logic*); (2) with those operations by which is ensured the correctness of the materials supplied, and their correspondence with the external realities which they represent (*Material Logic*). We are going to occupy ourselves with *Formal* Logic, which is so called because it defines the necessary *forms* or *laws* to which all correct Thought as such conforms itself, not with the laws regulating Thought in its relation to things outside, but with those only which regulate its internal operations in themselves. The scope of Logic, even under these restrictions, extends over the whole province of Human Thought.

We have now arrived at the Definition of Logic so far as this, that it is a branch of knowledge which deals with the Formal Laws of Thought. We have seen, moreover, that it has a practical end at which it aims, that is, has fixed and immutable laws to which all thinking must conform, that it is learned by a careful study of our processes of thought. We are now in a position to discuss the much disputed question whether Logic is an *Art* or a *Science*, or both an Art and a Science?

In order to answer this question satisfactorily, we must consider a few of the distinctions generally regarded as separating the arts from the sciences.

1. An *art* is learned chiefly by practice,[1] a *science* by study. Thus *painting* is an art, *embroidery* is an art, *rhetoric* is an art. Each of these indeed, like every art, has a scientific element in it, but its artistic side is in the foreground, and the scientific element is out of sight. None of these arts could be acquired by years of patient study. It is by the labour of continual practice that skill is attained in them, and innate ability rendered perfect. On the other hand, *geometry* is a science, *political economy* is a science, *harmony* is a science. Even where a certain amount of experience is required, as in *medicine*, to complete the results of the study and apply its principles, yet this is quite a subordinate element. A man may sit in his study with his books all his life long and be learned in *geometry*, *political economy*, and in *harmony*, and even in *medicine*, without any practice whatever.

2. A *science*, again, is based on fixed and immutable laws on which it depends for its very existence, whereas an *art* is always ready to change its method of procedure and to forsake the old paths. Every true art must indeed have an intellectual basis, and therefore certain underlying principles that govern it, but in all matters which are not of its essence as an art, it can adopt new methods and new laws, often the very opposite of those to which it has clung hitherto. It is far more pliable than science, and varies almost indefinitely with varying time and place. The laws of *rhetoric*

[1] Cf. Arist. *Metaph.* p. 981. (Berol. Ed.) αἱ πολλαὶ ἐμπειρίαι ποιοῦσι τὴν τέχνην.

vary with the character of a nation. The eloquence which held a Roman audience spell-bound would have little effect now in moving the minds of men, and would be pronounced artificial and tedious, in spite of the beauty of language and brilliancy of expression. To the practical Spartan the florid eloquence of other tribes of Greece was wearisome in the extreme: the rule of Spartan rhetoric was: Brevity above all things. The art of *dyeing cloth* or of *annealing iron*, is always ready to adapt itself indefinitely to new discoveries. The style of *painting* never remains the same for long. But a science admits of no such variations. The fundamental laws of *political economy* are the same now as in the days of King Solomon, however great the change that has been introduced into its practical working by the changed conditions of society. *Geometry* is not only the same in every age and every country, but is unchangeable wherever space and quantity are found.

3. Hence a *science* proceeds downwards from first principles to the special and individual applications of them. It takes its laws ready made. Even the inductive sciences use experiment and observation as a means of discovering existing laws, not of manufacturing them for themselves. But an *art* has in general unbounded liberty to make its own laws, so long as it violates no existing law of nature. The art of *painting*, although it must conform to a certain extent to the laws of perspective and colour, has the greatest possible freedom in all other respects and can encroach even on

these. Anything is lawful which will produce a really pleasing picture, even though it may violate some conventional propriety and rules hitherto held sacred. *Poetry* is equally free, and the purely mechanical arts have more freedom still.

4. But we have not yet reached the central distinction between Art and Science. Aristotle more than once compares them with each other, and gives us the key to their various points of difference. *Science*, he tells us, is concerned with that which exists already. *Art* with the production of that which does not as yet exist.[1] The end of *Science* may be practical, but it is never productive, or rather, as soon as it aims at production, it passes into an art. For instance, the Science of *Medicine* is essentially practical: it teaches the student what are the conditions of perfect health, what means are most serviceable to preserve it, what are the effects upon the human body of this or that acid or alkali, what is the nature and what are the causes of this or that disease. But it is not an *art* until the practical science is put into practice, *with the view of producing* certain definite results hitherto non-existent, of producing strength where before there was weakness, health where before there was disease. It then passes out of the character of the Science of Medicine and becomes the Art of Healing. It acquires new characteristics to qualify it for its new rôle as an Art. The scientific element is well-nigh forgotten, experience becomes more important, and

[1] Ἐπιστήμη περὶ τὸ ὄν, τέχνη δὲ περὶ γένεσιν. *Post. Anal* IV. 19, p 1008. (Edit. Berolin.)

he who practises it adapts his treatment rather to the results of his own experience than to the preconceived theories of Schools of Medicine. He begins to frame theories for himself, and throws to the winds received principles if he finds that by setting them at nought the health of his patients is advantaged. The Art of Healing, productive of health, acquired by practice, mounting up from facts to principles founded on these facts, caring little for theoretical laws, has taken the place of the Science of Medicine which accepts health and disease as already existing, is acquired by study, investigates their various characteristics as facts to be accounted for, argues downwards from general principles to individual cases and follows fixed and established rules.

Hence, *art is science employed in production*,[1] or, as Aristotle elsewhere defines it, *a productive habit of mind, acting in conjunction with reason*.[2] In every case it is the *production* that makes the *art:* painting, sculpture, rhetoric, music, poetry, are all productive, and it is in virtue of their productive or creative power that they have a claim to overleap law, which is not granted to science.

To apply this to Logic. We may begin with this central test, since all the rest are dependent upon the question of *productiveness*. Is Logic productive? That it is practical no one can doubt; the study of it is of the greatest value in furthering correctness of thought. But what does it produce

[1] τέχνη γὰρ ἐπιστήμη ποιητική. (*Metaph.* x. 9.)
[2] ἕξις μετὰ λόγου ποιητική. (*Eth.* vi. 3, 4.)

to qualify it as an art? We may answer the question by the parallel of medicine. The *science* of medicine deals with things as they are, studies them, lays down the laws of sound health, and describes the symptoms of disease. The *art* of healing deals with the *production* of health, and searches by every means of inquiry to find by experience the means of restoring it.

In the same way the *Science* of Logic deals with the existing Laws of Thought, clearly defines the conditions of correct thinking and the characteristics of correct Thought. But in the present condition of human nature, Logic is also needed as medicine to heal incorrect thought and produce truth and consistency where error and inconsistency have crept in. Hence we must have an Art of Logic as well. The logician in his study is a man of science, of *practical*, but not of *productive* science. But this is not enough if he is to fight the battle of Truth. He must descend into the arena and grapple with the prevalent fallacies of the day. He must restore intellectual soundness where disease had affected the faculty of thought; he must produce health where sickness had vitiated the intellectual processes; he must have at hand the appropriate answer to the plausible objection; he must watch for the opportunity of providing a suitable remedy for the poison which has weakened the keenness of mental vision. All this needs experience—it needs the power of ready argument and quick retort. Success depends not merely on the soundness of underlying principles, but also on the power of rapid

and suitable production. Such a man is an expert in the Art rather than in the Science of Logic. The science he had acquired has passed into the productive art. He derives his success from a skilful application of *Logica utens* to the special matter under discussion, but his skill necessarily implies in the background a thorough acquaintance with *Logica docens.*[1]

There is, then, an Art as well as a Science of Logic. But the Art is an appendage to the Science, and entirely secondary. The Science of Logic would still exist if men, in point of fact, always thought correctly; but the Art of Logic would in this case have no *raison d'être.* If *natural* Logic always had mastery over the thoughts of men, *artificial* or *acquired* Logic would indeed remain as a body of systematized rules for correct thinking (and therefore, as a practical science), but not as an art providing means of recovery from incorrect thinking. The fact that natural Logic is violable by man is the reason why acquired Logic partakes of the nature of an art.[2]

[1] *Logica docens* is the theory of correct thinking, the statement of the laws which always and everywhere are binding on the mental processes of all rational beings. *Logica utens* is the application of the general laws of Logic to this or that subject-matter; it is the practical employment of Logical laws in some special department of knowledge. *Logica utens*, for instance, will aid us in examining various theories of religious belief, and their accordance with right reason. It will enable us to detect the fallacies underlying many social and political, and even scientific arguments, by the use of which brilliant hypothesis too often takes the place of well-established principle.

[2] *Natural* or *innate* Logic consists of that body of unwritten law which nature imposes on all rational beings, and which all correct

Hence Logic is primarily a Science, and in its definition there is no need to introduce its subordinate character and functions as an Art. *Formal* Logic is the Science of the Formal Laws of Thought or of the Laws of Thought as Thought. *Material* Logic is the Science of those Laws of Thought which arise not merely from the nature of Thought itself, but from the nature of the objects about which we think. Logic in general (including both Formal and Material Logic) may be defined as *The Science of the Laws of Thought,* or *The Science which directs the operations of the intellect in its knowledge of Truth,* or *The Science which is concerned with the observance of due order in our intellectual operations.*

One other question must be briefly considered before we dismiss our Definition of Logic. Is it a *speculative* or a *practical* Science?

Let us see what is the distinction between a *speculative* and a *practical* Science. We cannot decide this by the mere examination of the matters of which Logic treats, or of the manner in which it treats of them. Its character as speculative or

pursuit of accurate knowledge. It is *speculative* in so far as it teaches us truth; it is *practical* in so far as it teaches us how to follow after truth. It is *speculative* in so far as it imparts information to us; it is *practical* in so far as it teaches us how to gain information for ourselves. This distinction corresponds almost exactly to the distinction between *Logica docens* and *Logica utens* given above.

We are now in a position to examine various Definitions which have been given of Logic by modern writers.

1. "Logic is the art and science of reasoning (Archbishop Whately). It is an art so far as it aims at the practical object of securing our minds from error, a science in so far as it is an analysis of our processes of thought."

This definition is at the same time too wide and perhaps also too narrow. It is too wide because it includes the subordinate element of the Art of Logic, too narrow because it confines the province of Logic to reasoning, omitting the other processes of thought. It is true that these are processes previous to reasoning, but they have their independent value and laws of their own, and ought not to be altogether discarded.

2. "Logic is the Art of Thinking" (Arnauld).

Here the Science of Logic is entirely ignored, and that which is the derivative and subordinate aspect of Logic is put forward in usurped monopoly of its whole domain. The Art of Thinking is, moreover, an expression which is vague and meaningless. Even if we put the best possible construction on it,

and explain it as the art of guiding our thoughts aright, it would still be open to the objection that it introduces considerations altogether foreign to Logic, such as the avoidance of hasty conclusions, preconceived notions &c.

3. "Logic is the Science of the operations of the human understanding in the pursuit of Truth" (Port Royal Logic).

This definition has an unnecessary appendage in the last words. The human understanding is as much ruled by Logic when it is in the possession of Truth as when it is still pursuing it, when it contemplates Truth already attained as much as when it is still searching after it. Is Logic to exercise no sway over our minds when we are pondering over truth *in re* as well as when we are hunting after Truth *in spe?* We may perhaps admit the Definition if we omit these last words, though it still fails clearly to mark off Logic from Psychology, or to exclude from Logic ethical considerations foreign to its scope and purpose.

4. "Logic is the Science of the operations of the understanding which are subservient to the estimation of evidence" (J. S. Mill).

The objection that this on the one side extends Logic beyond its proper limits, and on the other limits it unduly, may be urged against this definition no less than against the last mentioned. The "estimation of evidence" includes the weighing of the character of the witnesses and the examination whether their evidence is to be relied upon, and with this Logic has nothing to do. It moreover

admits into the domain of Logic no truth based on any source but external experience, since "evidence," in the sense in which Mr. Mill uses the word, is something presented to the mind from without. It thus involves the fundamental error of the Empirical School.

5. "Logic is the science of argumentation (*scientia argumentandi*)."

This is the definition of Albertus Magnus, as well as of certain Arabian logicians. It is liable to something of the same objection as the definition of Archbishop Whately, in that it tends to limit the sphere of Logic to reasoning. At the same time we must remember that, after all, the chief function of Logic is to enable us to argue correctly. This is its prominent characteristic, not only in the popular conception of the science, but in its practical application to the furthering of Truth. At all events this definition must be classed as incomplete rather than incorrect.

A few words must be added before we close this chapter on the history of the name *Logic*. The word itself (λογικὴ *scil.* πραγματεία) is not used by Aristotle as the name of a separate branch of study. The difficulty of defining its limits, or rather the fact that its limits cannot be exactly defined, sufficiently accounts for the omission. But he speaks of logical arguments, logical difficulties, logical demonstrations, and logical problems, much in the sense in which we use the word to express that which is concerned with thought. The term Logic, as the name of a separate branch of know-

ledge, came into use among the immediate followers of Aristotle, and is found in extant works of the third century.

The nearest approximation to a name for Logic in Plato and Aristotle is *Dialectic*. But Plato used the word in a wider sense, which included metaphysics as well. It was the science of the mind *discussing* with itself (διαλεκτικὴ from διαλέγομαι) the inner nature of things. Aristotle, on the other hand, restricted *Dialectic* to that branch of Logic which deals with probable matter, and takes for the principles from which it starts certain general probabilities which a number of disputants are all willing to accept as the basis of their discussion. With him it was the art (or science) of *discussion* or *disputation*, and thence it passed into the wider meaning of that branch of knowledge which deals with probable matter.

# CHAPTER III.

## THE FOUNDATIONS OF LOGIC.

Summary—Positive and Negative proof—Superiority of positive proof—Direct and indirect proof—All proof must rest on one common principle—Three conditions necessary to this principle—First Principles of Logic. I. The Principle of Contradiction necessarily the first of all—To deny this principle intellectual suicide—Impugners of the principle of Contradiction—Four conditions necessary to this principle, (1) Exactness of language, (2) Identity of standard, (3) Reference to same part of object, (4) Identity of time—Being and non-Being. II. The Principle of Identity—Nature of the principle—False views respecting it—Sir W. Hamilton's view. (1) Founded on false theory of conception, (2) Untrue in itself, (3) Unnecessary and useless.

In our last chapter we decided the difficult question of the Definition of Logic, and after examining the leading characteristics of Arts and Sciences respectively, we came to the conclusion that Logic is primarily a Science and secondarily an Art, and that this is true both of Formal and Material Logic. Its fixed and immutable laws, the necessity of study rather than practice as a means of becoming a good logician, the absence of any productive element as an essential part of it, all point to its scientific character. At the same time there is an art of

Logic which depends on practice and is far more pliable in the laws on which it is based. Yet Logic might perfectly well exist without it. We therefore defined Logic as *The Science of the Laws of Human Thought*, and we compared this definition with several others given by modern logicians, and stated our reasons for maintaining it.

Our investigation will therefore be into the various laws or forms to which our thinking processes are subject. But in building up our logical structure we must first of all look to the Foundations and make sure of the First Principles on which all thinking rests, and of which the various Laws of Thought are the detailed expression. Whence are we to begin and what is to be the solid basis, unassailable and impregnable, on which all else shall rest secure?

Every science has its primary laws or axioms. If Logic is really the science of all sciences, we must find in its First Principles that which is the foundation, not of Logic alone, but of all other sciences whatever. If Logic is to expound to us what correct thinking is, it is of the greatest possible importance that we should be able to place absolute confidence in the axioms from which it starts, since they are to have dominion over every thought we think, every judgment we form, every conclusion we draw. Whatever be the subject-matter, out of all things in heaven and earth about which we think, those first principles must be accepted as supreme, irrefragable, universal, immutable, eternal.

Before we lay down what these First Principles

are, there are one or two important points to be noticed.

1. Without anticipating what we shall have to say about *proof*, we may lay down the existence of a double method of proof. We may prove a thing either directly, by showing from certain positive principles respecting it that it is so, or indirectly, by showing the impossibility of any other alternative. I may prove, for instance, the proposition: The exterior angle of a triangle is greater than either of the interior and opposite angles: either directly by a positive course of argument, or indirectly by showing the absurdity which follows from the supposition of its being equal to or less than either of them.

2. It is clear that positive argument is better than negative. Positive or direct proof teaches us immediately what things are: negative or indirect argument teaches us what they are, only by an inference from what they are not. Positive proof, moreover, not only teaches us what things are, but gives us an insight into the reason why they are so. Negative proof in its final result never gets beyond the conclusion that something that was in dispute is really true.

3. Direct and indirect proof starts in the first instance from one and the same principle. But direct proof has a secondary principle, which depends upon and is immediately derived from their common first principle, and is so closely allied to it that some philosophers regard them as virtually identical. This secondary principle of *direct* or

*ostensive* proof will be something positive, corresponding to the nature of the proof which follows from it.

4. The common principle on which direct and indirect proof alike are based will be the ultimate principle underlying all other principles, and by means of which they can be demonstrated. It is the principle to which they must all be brought back and on which they depend for their validity. By its supreme virtue they are established. If it should fail, all other principles, nay, all reasoning and all truth, disappears from the mind.

5. Three conditions are necessary for the first principle on which all else are to depend:

(1) It must be such that it is evident in itself so that no one can deny it, or set it aside. Without this it could never obtain our confidence, and all that followed from it would be unreliable.

(2) It must be such that it does not depend on any other principle going before it. It must be absolute, not subject to any sort of condition or qualification.

(3) It must be incapable of demonstration, otherwise it would not be a first principle but a conclusion from certain other principles which it would suppose as going before it.

6. It is clear from what we have said, our *first* principle need not be our *only* principle. There may be many primary laws known to us in themselves and not capable of direct demonstration.

But there must be one taking precedence of all the rest on which all else in some way depend, by means of which they can be directly or indirectly proved to be true.

Having premised this, we may proceed to lay down in order the Principles or primary laws of Logic, and not of Logic only, but of all Science and of all Truth. These are:

1. The Principle of Contradiction.
2. The Principle of Identity.
3. The Principle of Causation.
4. The Principle of Excluded Middle.

I THE PRINCIPLE OF CONTRADICTION.—First and foremost, implied in and underlying all other principles is that which is commonly called the Principle of Contradiction. It may be enunciated thus: *Nothing can at the same time exist and not exist;* or, *It is impossible at the same time to affirm and to deny;* or, *Nothing can at the same time possess and be without the same reality;* or, *Contradictories are incompatible.*

Why do we call this the First of all Principles? On a matter so important we have to justify our assertion, more especially as we said that positive proof is better than negative, and therefore we should at first sight expect the foundation of all the rest to be something positive also.

The one idea that underlies all others is the idea of *Being*. Whatever we think of, we think of as having some sort of *Being;* else we could not think of it. *Being*, therefore, is the idea which is

at the basis of every thought we think, the first and most universal subject of Thought. Hence our Ultimate, our Primary Principle will be that which exhibits the primary relation of Being. But such a relation cannot exist without something to be related to it. Relation even in thought requires two distinct terms. Hence the first Relation of being must be to something distinct or different from Being. But that which is different from Being must necessarily be not-Being, and therefore our ultimate and primary principle must enunciate the relation between Being and not-Being. What is this relation? Obviously one of exclusion or contradiction. "Nothing can at the same time possess Being and not-Being"—*Nequit idem simul esse et non esse;* or, in the words of St. Thomas: "We must not affirm and deny simultaneously"—*Non est simul affirmare et negare.*

On this Principle of Contradiction all proof is based, direct and indirect. It enunciates the very first Principle of Being, and therefore precedes in the order of Reason any other possible statement. It therefore underlies all thinking. It is implied in every act of Thought, in every assertion we make. It is a necessity of our reason. He who refuses to acknowledge its universal supremacy, commits thereby intellectual suicide. He puts himself out side the class of rational beings. His statements have no meaning. For him truth and falsity are mere words. According to him the very opposite of what he says may be equally true. If a thing can be true and false at the same time, to what

purpose is it to make any assertion respecting any single object in the universe? Fact ceases to be fact, truth ceases to be truth, error ceases to be error. We are all right and all wrong. What is true is false and what is false is true. Statement and counterstatement do not in the least exclude one another. What one man denies another man may assert with equal truth, or rather there is no such thing as Truth at all. Logic is a science, yet not a science. The Laws of Thought are universal, yet not universal. Virtue is to be followed, yet not to be followed. I exist, yet I do not exist. There is a God, yet there is no God. Every statement is false and not false, a lie yet not a lie. It is evident that the outcome of all this can be nothing else than the chaos of scepticism pure and simple, a scepticism, too, which destroys itself by its own act. If the Law of Contradiction can be set aside in a single case, all religion, all philosophy, all truth, all possibility of consequent thinking disappear for ever.

Yet, strange to say, not a few of those who call themselves Philosophers in modern days banish the Law of Contradiction from a portion, or from the whole field, of human knowledge. Kant has the very questionable honour of having first initiated the doctrine of *Antinomies*, or contradictions existing side by side, but nevertheless both of them true in point of fact, albeit to our reason irreconcilable. Schelling and Hegel follow in his steps, and declare that the Law of Contradiction has no application to absolute Truth. Dean Mansel tells us, in his

*Limits of Religious Thought*, that the fundamental conceptions of a rational Theology are self-contradictory. Sir W. Hamilton assures us, in his *Lectures on Logic*, that in our knowledge of the absolute we must repudiate it.[1] Archdeacon Farrar enumerates the *antinomies* of St. Paul, which he declares to be irreconcilable to human reason.[2] Mr. Herbert Spencer declares Theism and Atheism to be equally untenable by the intellect of man. Many of the Hegelian School go so far as to identify existence with non-existence, and to declare that all contradictions are but partial expressions of one all-embracing Truth.[3] What else is this but to deny the existence of all Truth, to make all philosophy impossible, to render all argument a mere childish manipulation of unrealities, all investigation of Truth a mere futile and fruitless search after the Philosopher's stone?

At the same time we must carefully guard our definition of the Principle of Contradiction. It may easily be misapplied unless we hedge it in with certain conditions, which are all indeed implicitly contained in it, but nevertheless may be overlooked unless we state them explicitly.

1. When we say that contradictions cannot be simultaneously true of the same object, we must beware of any ambiguity in our language, and of any consequent confusion in our thought. If there is the faintest variation in the *sense in which we use*

[1] *Lectures on Logic*, Vol. III. p. 89.
[2] Archdeacon Farrar's *Life and Writings of St. Paul*. II. 590.
[3] Cf. Michelet, *Esquisse de Logique*, 3, 4, 12.

*our terms*, our law does not hold good. We may admit that a man may be at the same time *wise* and *not wise*, if we are alluding to two different kinds of wisdom. If in the proposition: *This man is wise*, we mean that he is a prudent, sensible, canny man in business matters, and in the proposition: *This man is not wise*, that he holds many foolish opinions on speculative questions, the two propositions may be simultaneously true, in spite of their being verbal contradictions. If I say of him that he is a *clever fellow*, using the word in the American sense of an amusing, witty, pleasant companion, and afterwards assert that he is *not a clever fellow*, using the word in the English meaning of a man of good mental capacity, the two statements, notwithstanding their apparent incompatibility, may both be in accordance with fact. There are comparatively few common words which do not admit some variation in meaning, and the fainter the variation the more necessity for being keenly alive to it. An event may be at the same time *impossible* and *not impossible*, according as we used the word to signify *moral* or *absolute* impossibility. A man may be at the same time *obsequious* and *not obsequious*, if we pass from the old-fashioned to the modern use of the term. Our friend may be *at home* yet *not at home*, on the occasion of our unwelcome visit; a dog may be *intelligent*, yet *not intelligent*; prudence may require that we should be *simple*, yet *not simple*, and so on.

2. We must also take care that we use our words *in reference to the same standard*. A mar

is walking fast who completes five miles within the hour, but a horse who takes the same time for the same distance is not at all fast in his rate of motion, so that we may say that the rate of five miles an hour is both *fast* and *not fast*—fast for a man, not fast for a horse. In the same way, *large*, *high*, *broad*, *soft*, *wild*, and many other adjectives are modified by the word to which they are joined, and have no absolute and fixed meaning in themselves, but are referred to it as their standard. Wood is esteemed *soft* when it is of a consistency which we should not call soft if we were speaking of wool; a child of ten years old is *tall*, though it would be the reverse of tall if its stature were the same eight years later.

3. In speaking of composite objects, we must be very exact in applying our terms to *the same part of the object*. A child may be *fair* and yet *not fair*, if in the one case we are speaking of eyes and complexion and in the other of its hair. A man may be *cold* and yet *not cold*, cold in reference to his bodily temperature, not cold in respect of his warm and generous heart: he may be *strong* and yet *not strong*, strong in his muscles, not strong in his general constitution.

4. Lastly, we must insist on the exact application of the words *at the same time*. The same thing cannot be true and false of the same object of thought at the same point of time; but we must remember that in one instant that which was false may become true and that which was true may become false. It is for this reason that our comparison of two

external phenomena can never be perfectly exact. We never can eliminate the element of a difference of time between the two observations. While we were observing the first, the second may have changed its character, so that we are not comparing together P and Q as simultaneously existing, but P as it exists at the moment $x$ and Q as it exists at the moment $x + dx$. A complete reversal of the conditions of being may take place in the fraction of a second. There is no measurable interval between the state of life and the state of non-life or death. An act of contrition flashing with the rapidity of lightning through the soul of a dying man, may utterly and entirely change the character of his soul and his relations to God, so that he who was before the enemy of God, a rebel, loathsome and deserving of hatred, becomes at the very next instant, by a sort of magic transformation, the friend of God, His loyal subject, beautiful and worthy of His love. In such a case as this, *good* and *not good*, *obedient* and *not obedient*, *meet for Heaven* and *not meet for Heaven*, are true of the same object within two seconds of fleeting time.

Or to take a very different illustration of the necessity of thus guarding our law, and one of no infrequent occurrence in practical life. A man is being tried for robbery. The counsel for the defence urges that the prisoner cannot be guilty because the witnesses allow that the robber was a bearded, a heavy whiskered man, whereas the prisoner was on the very day of the murder closely shaven. His argument is that bearded and not

bearded, shaven and not shaven, cannot be true of the same man at the same time. But if the counsel for the prosecution can show that the prisoner had time enough between the moment when the robbery was committed and the moment of his apprehension to go home and shave off beard and whiskers alike, the defence obviously becomes worthless, because the condition of simultaneity is not fulfilled.

These four conditions seem obvious enough, but a large proportion of the error prevalent in the world arises from a neglect of one or the other. When men find contradictions in Rational Theology, it is because they do not see that the attributes of God are necessarily referred to a different standard from the perfections of man, and exclude from themselves that which is a human perfection only in virtue of man's finite and contingent nature. When they attack the Christian religion as teaching that which it is *impossible* to believe, they often do not analyze exactly and distinguish from each other the various meanings of the word *impossible*. They do not distinguish between that which contradicts the every-day evidence of sense, or the laws of probability, and that which contradicts the immutable laws of Reason.

The Principle of Contradiction is therefore prior to all other principles whatever. It is the ultimate principle to which all others are reduced, and without which they would have no force. It is the principle which pre-eminently stands on its own basis. "In all human science," says Suarez,[1] "and

[1] *Disp. Met.* III. iii. 8—10.

especially in the science of being, it is simply and absolutely the first. From it all other principles are proved. It is, as it were, the Universal Foundation on whose virtue all proof depends, and by means of which all other principles can be set forth and established as truths known to men."

But an objection is sometimes raised to the Principle of Contradiction as the ultimate principle, on the ground that the *positive* is prior to the *negative*, and that therefore some positive Principle must be anterior to it. This is no new difficulty, but is met and answered by Suarez, who says that it is quite true that in the constructive order and the order of production (*in ordine generationis et compositionis*) the positive must precede the negative, but not when we regard truths in the order in which they are known to men (*sub ratione veritatis humano intellectui cognitæ*).

This distinction is worth a moment's consideration. We may consider the growth of truth either in itself, or as taking place in the mind of man. The order of growth will not be the same under these two aspects. "Whatever is received, is received according to the nature of the recipient," and human nature in receiving truth, must begin by repudiating what is necessarily opposed to truth. But it does not follow from this that Truth in itself is built upon a negative foundation. In metaphysical truth all is positive from the beginning to the end. There is nothing to repudiate or reject. *Being* is its foundation, and the attributes of *being* are its superstructure. It does not recognize non-being at

all. Non-being from the very nature of things, has no sort of existence.

But for us Non-being is but another name for falsity, and we must begin by repudiating it. Hence, for us it is the negative principle which is above all self-evident and manifest, and therefore every branch of human knowledge must be based upon it. In Logic we are not concerned with realities as coming into existence outside of us, but with realities as coming within the range of our intellects. We have not to consider the order into which various truths fall in themselves, but the order into which they fall as they take their place in our mental furniture. In this latter character the Principle of Contradiction has no rival. In the order of truths, *as known to us*, it reigns supreme.

But this negative principle is only satisfactory as preliminary to something farther. We need some positive principle separate from it, depending indeed upon it, but yet at the same time self-evident, if once the Principle of Contradiction is previously granted.

II. THE PRINCIPLE OF IDENTITY.—This second principle may be termed the Principle of Identity. It is enunciated in the formula: *Every being is its own nature*, or, *Every being is that which has an essence of its own* (*omne ens est sua propria natura*, or *omne ens est habens essentiam*).

This principle is the foundation of all definition and of all demonstration; it is of all definitions the most universal. In every definition that I lay

down, I am stating a particular instance of this universal law. If, for instance, I lay down that, *All ink is a liquid used for purposes of writing or printing*, I am stating the proper nature or essence of ink, and so merely a particular case of the proposition, *Every being is its own nature.*

If I lay down that, *A cygnet is a young swan*, I am again assigning to a special kind of being its own special nature.. Or if my proposition is, *All eicosahedrons are rectangular figures*, I am acting on this same principle, though here it is but a *portion* of the complex nature of an eicosahedron that I am assigning. Similarly, if I state that, *All chimpanzees are sensitive*, my statement gives a part of the nature of chimpanzeeism.

But while the Principle of Identity states that every being is identical with *its own nature or essence*, this does not mean merely its identity with *itself*. It is not sufficiently expressed in the form, *Omne ens est ens.* The principle of Identity goes further than this. As the first relation of Being is to non-Being, so its second relation is to its own characteristics. *Prius est esse quam tale esse.* First comes Being with its consequent relation to Non-being, then comes that which characterizes Being—its own nature, which is necessarily identical with it. First comes the Principle of Contradiction, presenting Being in its primary relation; then comes the Principle of Identity, stating the relation of Being, not to itself (for such relation is no relation at all, any more than a man could be called one of his own relations), but to that which is comprised in it.

Thus *A cygnet is a young swan*, states the relation of *cygnet* not to *itself*, but to the combined ideas of *youth* and *swan-nature* which are comprised in it, and states this relation to be one of identity. The notion of *cygnet* is resolvable into, but not the same as, the notion of *young swan*. It may be true objectively that the two things are identical, but we are talking now of the foundation of mental truth. The two ideas which are presented to our minds are not the same. They are united in the act of definition, and the definition given is *coextensive* with, not identical with, the thing defined.

Here we have to be on our guard against a modern error. The Principle of Identity, that *Every being is or contains its own nature or essence*, has been distorted by some modern logicians, and thrust forward into the first place as the first and ultimate basis of all Truth. It has been clothed in a garb that was not its own. It has been stated in a formula which has the plausible appearance of a guileless simplicity, and it has then (or rather this perversion of it) been put forward as the rival of the Principle of Contradiction for the office of President of the Court of Final Appeal for all Demonstration, and as not only independent of it in its decisions, but its superior and proper lord.

This new Principle, which is really no principle at all, has usurped to itself the name of the Principle of Identity, and enounces itself in the simplest of all Propositions—*A is A*, or, *Every object of thought is identical with itself*. It is indeed the most obvious of all truisms, which the wildest sceptic would never

venture to deny. Even the man who questions his own existence (if such an one exist) cannot deny that *A is A*. Its upholders accordingly represent it as the backbone of all thinking, the all-pervading principle taken for granted of every mental act. It is to be the underlying basis of every department of knowledge. Art, Science, Philosophy, Theology, all are to rest on *A is A*, and without it would cease to be.

This is all very satisfactory if it is correct. We must, however, examine into its claims before we dethrone the Principle of Contradiction and set up this new-comer in its place. We must subject it to very careful scrutiny before we accept a law which Aristotle and St. Thomas do not recognize.

What is the account given of this New Principle by its great advocate, Sir W. Hamilton?

"The principle of Identity (*principium Identitatis*) expresses the relation of total sameness in which a concept stands to all, and the relation of partial sameness in which it stands to each, of its constituent characters. In other words, it declares the impossibility of thinking the concept and its characters as reciprocally unlike. It is expressed in the formula *A is A*, or $A = A$; and by *A* is denoted every logical thing, every product of our thinking faculty,—concept, judgment, reasoning, &c.

"The principle of Identity is an application of the principle of the absolute equivalence of a whole and of all its parts taken together to the thinking of a thing by the attribution of constituent qualities or characters. The concept of the thing is a whole,

the characters are the parts of that whole. This law may, therefore, be also thus enounced,—Everything is equal to itself,—for in a logical relation the thing and its concept coincide; as, in Logic, we abstract altogether from the reality of the thing which the concept represents. It is, therefore, the same whether we say that the concept is equal tc all its characters, or that the thing is equal to itself.

"The law has, likewise, been expressed by the formula,—In the predicate, the whole is contained explicitly, which in the subject is contained implicitly."[1]

But this much-vaunted principle, which puts forward such all-embracing demands and requires that all else should be subservient to it, proves on careful inspection to be a miserable impostor, usurping a precedence to which it has no sort of claim. It has its foundation in the false theory of Conception which Sir W. Hamilton puts forward, and of which we shall have occasion to speak in a future chapter. Without anticipating what we shall there say, we may state here that according to him our *idea* of an object is nothing more than its various *attributes* tied together in a bundle, combined together in a sort of unity derived not from their co-existence in the object as realities, but from the mind which has power to invest them with it. Hence he regards Definition as a sort of untying of this mental bundle and declaration of its contents, not as an unfolding of the nature of the thing defined. It is but a reversal of the process that the mind has previously

[1] *Logic*, I. 79, 80.

performed, not an analysis of the object of thought. Hence a Definition is the definition of a *concept*, a summing up of the contents of the *concept*. All is subjective. He talks of the constituent characters of a *concept*, and asserts that "it is the same whether we say that the concept is equal to all its characters, or that the thing is equal to itself." Sir W. Hamilton leads his readers astray by ignoring the distinction between the identity of an *object* with its own *nature* and the identity of a *concept* with its *constituent characters*. The one, indeed, may be stated in the formula, $A$ is $a+b+c+d+$, &c.; the other ought to be stated $A$ *is* $A$. He has no right to treat these two propositions as the same. He would not do so were it not that he supposes the concept $A$ to be simply a bundle of the attributes of $a$, $b$, $c$, $d$, &c., summed up under the name $A$.

This is our first objection to Sir W. Hamilton's Principle of Identity. It is founded on a basis of false analysis. It regards our ideas as a mere bundle of qualities. It confuses the object outside of us with the idea within us. It has in it the latent venom of his doctrine of all concepts or ideas being relative to the individual mind that forms them, and not possessed of any sort of objective reality of their own.

Hence, secondly, he states respecting the concept what is true of his false notion of concept, but is not true of concepts as they really are. If I say that *a parsnip is a non-sensitive substance*, no one could say that the idea of *non-sensitive substance* is identical with that of *parsnip*, nor even that there is a partial

sameness. It is true that the external realities are identical, but it is not true that the ideas are identical, unless we regard ideas under the false light under which he himself regards them. How can *A is A* represent the proposition that *parsnips are non-sensitive substances*, or that *parsnips are not umbelliferous plants?* The two objects of thought coincide in instances existing in the external world, but not in the minds of men.

Thirdly, even if it were true that an idea is identical with its constituent characters, this formula *A is A* would apply to definitions only. If I say, *Men are substances*, there is no identity between the two concepts. What is meant by a *partial sameness? A is A* supplies us with no support for a proposition where subject and predicate are not co-extensive. It does not even provide us with a basis for a proposition in which they are co-extensive, if their comprehension is different, *e.g.*, *All men are rational creatures*, is not the same as *A is A;* for although the class of men is co-extensive with that of rational creatures, yet man, besides the concept rational and creature, is characterized by sensitiveness, life, &c., which must not be omitted if there is to be real identity between the subject and predicate.[1]

But all these defects in Sir W. Hamilton's Principle of Identity are but the natural consequence of its attempting to take the place of the axiom which we have already proved to be the ultimate axiom to

[1] Cf. Rev. T. Harper, *Metaphysics of the School*, II. pp. 34, &c., to whom I am indebted for several of the arguments here adduced.

which all else ought to be referred. If what we have said is true, that the Principle of Contradiction represents the primary Relation of Being, that all else must be referred to it, this Principle of Identity must needs be an usurper. Instead of being the fruitful tree that its advocates assert, it is but a barren trunk whence nothing proceeds. The plausible proposition *A is A*, with its sleek simplicity and wonderful universality, turns out to be only a foolish truism which never can get beyond itself. If it had not presumed to usurp the first place, and to arrogate to itself an universal and absolute dominion to which it has no right, it might perhaps have been tolerated under the unsatisfactory form of the proposition *A is A*. But in seeking to dethrone the Principle of Contradiction, it revealed its true character, as the offspring of the false theory of conception which underlies the whole of the Hamiltonian Philosophy.

On the one hand then we have the *true* Principle of Identity enunciated in the scholastic formula: *Every object is its own nature*, and on the other, the *false* Principle of Identity enunciated in the modern formula *A is A*, or *Every object is itself*. The former is the fruitful parent of all *a priori* propositions. The latter is a purely tautological and unfruitful formula which can produce nothing beyond itself, which we may therefore dismiss as one of the many mischievous impostures with which modern philosophy abounds.

# CHAPTER IV.

## THE FOUNDATIONS OF LOGIC (*continued*).

**Summary.**—The Principle of Identity—Propositions derived from it—These Propositions not tautological or verbal Propositions—Their limits—Distinction of *a priori* and *a posteriori* Propositions—Deductive and Inductive Sciences—Analytical and Synthetical Propositions—Are all *a priori* Propositions analytical?—Kant's doctrine of *a priori* synthetical Propositions—Its falsity—Implicit and explicit knowledge—Our advance from truisms to Truth.

IN our last chapter we laid down as the Primary Law of the Human Mind, and therefore the ultimate foundation of Logic, the Principle of Contradiction. We showed how the denial of this is intellectual suicide—a suicide of which many who call themselves philosophers are to be held guilty. We laid down the conditions necessary for the validity of this Law, and pointed out how almost all human error arises from the neglect of one or other of them. We then passed on to the Principle of Identity, and distinguished it in its true form from the false Principle which some modern philosophers have thrust forward as the rival of the Law of Contradiction. We must now discuss the Law of Identity in its further character of the generative source of further Truths.

We have already said that the true Principle of Identity is the *deductive basis* of all positive reasoning, and we remarked at the end of the last chapter that it is the *parent* of all *a priori* propositions Why do we draw this distinction between its character as the *basis* of all positive reasoning and the *parent* of *a priori* propositions? What, moreover, do we mean by *a priori* propositions, and to what are they opposed? Here we enter on an important part of our subject, which is, indeed, in some respects a digression, but which it is necessary to explain here in order to show the true position of the Principle of Identity.

The Principle of Identity is stated in general in the formula we have already given. But when we descend from the general to the particular, from Being to some particular kind of Being, the form that it assumes is a proposition which unfolds the nature, or some portion of the nature, of the object of which we speak.

Thus, when I apply the general principle, *Every object is its own nature*, to that particular object called a *square*, the form that it assumes, or rather, the Proposition that it engenders, is an analysis of the idea of a *square*, viz., *Every square is a four-sided figure with right angles and equal sides.* But here we must remember that these propositions are very different from tautological or verbal propositions.

1. A proposition in which the predicate is an analysis of the subject is not a *tautological* proposition. It explains the *nature of the subject*, declares its essence, and proclaims a fact of which we may

be entirely ignorant. A *tautological* proposition never gets beyond the *meaning of the words*. It is generally a mere translation from one language to another, or a repetition of a set of words which necessarily mean the same thing. It introduces no ideas beyond those which can be extracted from the word which forms the subject. If I say, *A ringlet is a little ring*, my proposition is tautological. But if I say, *A ringlet is a lock of hair, twisted into the form of a ring*, my proposition is an assertion of the identity of the object with its own nature. Similarly the following propositions are tautological. *A quadrilateral is a four-sided figure. The Ursa Major is King Charles' Wain. The periphery of an orb is the circumference of a circle. Circumlocution is roundabout talk. A Parliamentary orator is a man who delivers orations in Parliament*, &c. Here there is no analysis of the object of which we are speaking or thinking; the statements made are merely verbal, and are entirely independent of the nature of the thing.

2. The unfolding of the nature of the object of thought does not mean a mere verbal explanation. It is an analysis of the *idea*. Thus the analysis of the object called a *triangle* is *three-sided* figure, not *three-angled*. The etymological signification of a word is often very misleading, as in *villain, hypocrite, silly*, &c. Our analysis must set forth the nature of the *object* as it is in itself, and the object must be that which, in the ordinary language of men, is represented by the word.

How far are we to extend the limits of pro-

positions deducible from the principle of Identity? Is every affirmative proposition ultimately one of its offspring? Are all the Truths in the world derived from it? Certainly not. There is a wide distinction between two classes of Propositions. Those belonging to the one class claim this Principle as their parent. Those belonging to the other, though subject to its dominion, and in some sense founded upon it, are nevertheless something more than an application of it to some individual object, but are the product of observation or experiment. They do not merely analyze the nature of the subject and set it forth in the predicate, as a particular instance of the identity of all Being with its own nature, but add something which is not contained in the idea which forms the subject of the proposition.

This latter class of Propositions are called *a posteriori propositions* as opposed to *a priori propositions*. They introduce an element which is derived from outside. They are not necessitated by the very nature of things. They are dependent on experience, and with different experience they may be no longer true. They are reversible in a different state of things. They are true in the known Universe, but there may be a Universe where they are not true. It is possible that in some still undiscovered star, the light of which has never reached us, they may be false. They may be true at one time and not at another. Even if they are in point of fact always true, their truth is not a matter of absolute necessity. They are called *a posteriori* because we

argue up to them from particular facts which are posterior to the laws which govern them.

All the Laws of the physical world are *a posteriori*, not *a priori* propositions. They cannot be evolved out of our inner consciousness. No one could have discovered the Law of Capillary attraction, or the Laws of Light and Heat, by merely sitting in his study and seeking to work out the problem from first principles. For all these careful observation and experiment were needed. They are not necessary laws. They are reversible, and sometimes are reversed or set aside if their Divine Author intervenes by what is called a miracle. Here it is that they differ from necessary or *a priori* laws. No Divine power can set aside the law that *all the angles of a triangle are equal to two right angles*, or that *the whole is greater than its part.* It is absolutely impossible that in any portion of the Universe, actual or possible, this could be the case. Necessary or *a priori* laws are founded on the inner nature of things, which cannot be otherwise than it is. They are therefore eternal as God is eternal. They existed before the world was, and will exist to all eternity. They stand on quite a different footing from those physical laws which are simply a positive enactment of God, which He could at His good pleasure at any moment annul.

Corresponding to these two sets of Laws are two kinds of science. On the one hand there are sciences which are based simply on these *a priori* laws. As their First Principles are eternal, so they are eternal. They all consist of a series of applica-

tions of the Law of Identity to the subjects with which they deal. Mathematics is an *a priori* science. Its axioms, postulates, and definitions are all the direct offspring of the law of Identity. Ethics is an *a priori* science, and therefore the whole ethical system may be constructed out of a particular application of the fundamental laws of right and wrong which are merely this same Law in concrete form. Natural Theology is an *a priori* science, and reason can attain to a knowledge of God (so far as we can discover His nature by our rational faculties) without any extrinsic aid, starting from the Law of Identity as our *point d'appui*, and applying it to the various objects around and about us.

But there are other sciences in which this is not the case. What are called the *Natural* Sciences are not exclusively based on the Principle of Identity. They all are dependent on it indeed and own its sway, but it is not sufficient of itself to enable them to work up their materials without any extrinsic aid. They have to appeal to other sources for the means of working out their conclusions. Chemistry could never have developed itself out of chemical concepts and the fact of the identity of every being with its own nature. Botany could not have advanced a step unless it had been able to call in other fellow-workers to produce its results. Zoology would have no existence as a science unless it could appeal to external aid in building up its laws. The method of procedure of these sciences is a different one altogether, and it is important to

the logician clearly to discern in what the difference consists.

There are thus two main divisions of Science, as there are two classes of Propositions. All Sciences are either *a priori* and *deductive* sciences, or *a posteriori* and *inductive*. It is very important to understand aright the distinction between them. A *Deductive* science is one which starts from certain first principles, and from these it argues down to special applications of them. It begins with the general and the universal, and ends with the particular and the individual. It starts from necessary and immutable laws, and from them *deduces* the various consequences which flow from them when they are applied to this or that subject-matter. The external world furnishes the materials with which Deductive Science deals, but has nothing to say to the laws which control those materials when once they are admitted into the mind and have become objects of Thought.[1] Mathematics is, for instance, a deductive or *a priori* science. It starts from certain necessary and immutable axioms. The world outside furnishes it with its materials, lines, angles, figures, solid bodies, &c. But these materials it manipulates without any further reference to the external world (unless

[1] A distinction is sometimes made between those deductive sciences which derive their materials from the external world, and therefore require experience as a *condition* of their study, and those which can be pursued altogether independently of the world outside when once the necessary ideas have been acquired and such an understanding of the meaning of the terms employed as definition conveys. *Mathematics* belong to the former class: *Logic* and *Metaphysics* to the latter.

by way of illustration); it imposes its own laws on the materials received, and all its conclusions are deduced from the laws as applied to the materials.

Not so an *Inductive* Science, which starts, not from necessary first principles, but from individual facts. It begins with the particular and mounts up to the universal. It does not start with its laws ready made, but has to build them up for itself gradually and step by step. It is true that it is controlled by certain necessary and *a priori* principles to which it must conform. It is subject to the same general laws as the Deductive Sciences, but besides this it has principles of its own which it elaborates for itself and which after a time it is able to establish as certain, though never certain with the same irrefragable certainty that is possessed by the laws of the *a priori* sciences.

The absolute immutability of all the laws of Deductive Science is based upon the fact that they are one and all merely particular applications of this Law of Identity. They are an elaborate and developed expression of it, an application of it to the materials supplied from outside. They are all derived from it and capable of being finally resolved into it again. When this fact is once grasped, it is easy to understand the supreme and unassailable position of the *a priori* sciences.

But there is another Division of Propositions which we must examine in order to discover whether what we have just said is true. Propositions, besides being divided into *a priori* and

*a posteriori*, are also divided into *analytical* and *synthetical*.

1. An *analytical* proposition is one in which the predicate is either contained in the subject or is virtually identical with it, so that from a knowledge of the meaning of words which stand as the subject and predicate we are compelled to assent, and that with infallible certainty, to the truth of the proposition. Thus, for instance, the proposition: *All planets are heavenly bodies*, is an analytical proposition, since the predicate "heavenly body" is already contained in and a partial analysis of the idea of planet.

For the same reason: *All sycophants flatter the great, All triangles have three sides and three angles*, are analytical propositions because *sycophancy* includes *flattery*, and *triangle* implies *three angles and three sides*.

Hence, given the laws of thought and a complete understanding of the terms employed, it is absolutely possible to arrive at all the analytical propositions in the world. There is no reason why all the truths of Pure Mathematics should not be thought out by one who never reads a book or goes outside his study-door. The only limit to the extent of our knowledge of analytical propositions is the inactivity and weakness of our feeble and finite intelligence. We need the support of sensible images appealing to eye and ear. Few men can work out an elaborate proposition of Euclid without a figure before their eyes to guide them. Yet none the less are all the propositions analytical from beginning to end. The

figure adds nothing to the proposition; it simply facilitates our apprehension of it.

2. A *synthetical* proposition, on the other hand, is one in which the predicate is not contained in the subject, but adds to it some fresh quality, or attribute, which an analysis, however minute, could never have discovered in it. Such propositions are sometimes called *ampliative*, because they enlarge our stock of knowledge. When, for instance, I say that *Canvas-backed ducks are found in Maryland*, or that *Fools are known by the multitude of their words*, I am adding to the ideas of canvas-backed ducks and fools what no mere analysis could have revealed in them. They convey into my mind fresh knowledge from outside, requiring experience and observation. These propositions are called *synthetical*, because they synthesize, or put together, the independent ideas contained in the subject and predicate respectively. They proceed from the simple to the composite. They do not make use of materials existing within our minds, but they introduce fresh materials which no amount of thinking could have thought out from the stock of knowledge already possessed. They cannot be reduced to the primary law given above, but are regulated by another code of law belonging to material logic. They may be universally true, but their universality does not depend on any primary law of thought.

Thus the proposition, *All men are mortal*, is a synthetical proposition, because the idea of humanity does not contain the idea of mortality. As a matter of fact, all men are subject to death, but it is

quite conceivable that some healing remedy might have been provided which would have averted death until the time of their probation was over, and that then they would have passed into a different state of existence, where death is unknown and impossible. As a matter of fact, Adam and Eve, at their first creation, were exempt from the law of death, and would never have died, had they not forfeited their privileges.

In the same way the proposition, *All men are possessed of the faculty of speech*, though an universal, is nevertheless a synthetical proposition. It is quite possible that men might exist who had no power of speech, but communicate their ideas to one another by some sign or other external expression. It is absolutely possible that men might exist who would still be really and truly men, though they had no power whatever of conveying their ideas from one to the other, but lived in intellectual isolation. The analysis of the idea of *man* does not include the idea of *speech-possessing*, even though we take the word *speech* in the widest possible sense.

We have now seen that a *synthetical* proposition is one in which the predicate is not contained in the subject, but requires some further knowledge beyond the meaning of the Terms and the Laws of Thought in order to establish it. An *analytical* proposition, on the other hand, presents in the predicate merely a portion of that which is already presented in the subject, and requires no further knowledge beyond the meaning of Terms and the

Laws of Thought to make good its validity. If the account we have given of them is correct, synthetical and analytical Propositions differ in no way from the Propositions we described above as *a priori* and *a posteriori*. An *a priori* Proposition is identical with an *analytical* Proposition, and means a Proposition which is simply an application of the Principle of Identity to some particular case. An *a posteriori* Proposition is identical with a *synthetical* Proposition, and means one which adds something from outside. The *analytical* or *a priori* Proposition stands on its own basis, and that basis is the Law of Identity. The *synthetical* or *a posteriori* Proposition is one which takes its stand on the basis of external experience, though at the same time it is referable to the Law of Identity as controlling and regulating it.

But here we come into conflict with Kant and a large number of modern logicians, who assert that there are some synthetical propositions which stand on their own basis, and are therefore *a priori*, not *a posteriori*. They do not regard all *a priori* propositions as ultimately reducible to an analysis of the nature of the object, but assert that there are some which, though universal, necessary, and immutable, nevertheless introduce in the predicate something which is not to be found in the subject. The motive of this assertion is a good one, for it is intended as a bulwark against the Experimental School who refer all laws, Deductive and Inductive alike, to experience, but it is a perilous bulwark if it is not founded on Truth.

We will take the two instances given by Kant in his *Critique of the Pure Reason.*[1] The first is the geometrical axiom: *A straight line is the shortest possible line between any two points.*

"We only require," he says, "to represent this statement intuitively, to see quite clearly that it holds good in all cases, that its contradictory is impossible, that to all eternity the straight line is the shortest way. No one will think of warning us to be cautious about this statement, or of saying that we have not yet collected enough experience to make the assertion for all possible cases, and that a crooked line might possibly in some cases turn out the shortest. The statement is valid, independently of all experience. We know forthwith that it will remain true throughout all experience. The statement is a cognition *a priori.* Is it analytical or synthetical? That is the important question."

This important question Kant argues by the following argument:

"In the concept of a straight line, however accurately we may analyze it, the representation of being the shortest way is not contained. Straight and short are diverse representations . . . the judgment is therefore synthetical and synthetical *a priori.*"

We will look into these two diverse concepts *short* and *straight,* and examine whether the diversity is a real or only a verbal one. If it is real, then we must allow that the judgment is a synthetical one,

[1] Kant's *Critique of Pure Reason* (English translation), I. 406.

and is not founded on the law of Identity. But what is the meaning of the shortest possible line between two points?

When we come to analyze it we find that it is only another name for the single word *distance.* Distance means the shortest possible distance. If a man asks me the distance from Fastnet Point to Sandy Hook, and I answer 10,000 miles, and afterwards defend myself against the charge of misstatement by explaining that I do not mean the shortest distance across the Atlantic, but one which would include a visit to Madeira and Demerara and the West India Islands on my way, I should be justly regarded as a lunatic. The two expressions, shortest distance and distance simpliciter, are synonymous.

But what do we mean by distance? We mean that amount of space which has to be traversed in order to go straight from one point to the other. And what is the measure of this space? Nothing else than a straight line drawn from one to the other.

Hence we have in *the shortest distance* merely another name for *the distance simply*, and *distance* has for its definition *a straight line drawn from one to the other point.* The one expression is an analysis of the other. The distinction between *straight* line, a *shortest* line, is merely a verbal one, and our axiom turns out to be an analytical proposition reducible to the identical proposition. *A straight line is one which goes directly from one point to another.* It is therefore an analytical, not a synthetical proposition.

Or again let us take Kant's other instance:

"Given the arithmetical statement $7 + 5 = 12$. It is inconceivable that $7 + 5$ could ever make any sum but 12. It is an *a priori* judgment. Is this judgment analytical or synthetical? It would be analytical if, in the representation $7 + 5$, 12 were contained as an attribute, so that the equation would be self-evident. But it is not so. $7 + 5$, the subject of the proposition, says 'Add the quantities.' The predicate 12 says that they have been added. The subject is a problem, the predicate its solution. The solution is not immediately contained in the problem. The sum does not exist in the several terms as an attribute in the representation. If this were the case, counting would be unnecessary. In order to form the judgment $7 + 5 = 12$, I must add something to the subject, viz., intuitive addition. The judgment is then synthetical and synthetical *a priori*."

To this argument we reply that in the first place it confuses together the equational symbol and the logical copula. The proposition $7 + 5 = 12$ does not mean that 12 is the predicate, so that if the proposition were an analytical one, it would be contained in the subject $7 + 5$. It is a proposition of equivalence or virtual identity, not of inclusion. It means that five units + seven units are equivalent to or virtually identical with twelve units. But, passing this by, is it true that there is anything added to the predicate which is not already contained in the subject? "The fact of intuitive addition," says Kant. But this intuitive addition does

not any more exist in the proposition $7 + 5 = 12$ than it does in the mere statement of the number *seven*. Seven means a certain number of units "intuitively added" together; but when we speak of seven we do not add anything to these seven units. We merely used a system of abridged notation. Seven means $1+1+1+1+1+1+1$. Counting is unnecessary in an addition sum, not because the proposition expressing it is a synthetical one, but because, our finite and feeble imagination being unable to picture at once more than a very limited number of units, we use numbers to express units added together, and we use higher numbers to stand for these lower numbers added together, and to express in condensed form a greater crowd of units than before. When we say to a little child, as we point to the cows standing around the milking-pail, "There is one cow and another cow and another cow: three cows in all," we do not make any "intuitive addition" when we sum them up as three. We either explain the word *three*, or seek to fix the number on the childish memory by the *symbol* three.

When, therefore, I say twelve, I mean $1+1+1+1+1+1+1+1+1+1+1+1$; when I say seven, I mean $1+1+1+1+1+1+1$; when I say five, I mean $1+1+1+1+1$; and when I enunciate the proposition $7+5=12$, I merely analyze the several concepts, and putting together these several concepts, I recognize as the result of my analysis that twelve is the symbol for a number of units identical with the number of units for which seven

is the symbol, in conjunction with those for which five is the symbol.[1]

In the same way, *The whole is greater than each one of its parts*, is an analytical proposition. If we analyze *whole* we find that it means "that which contains more parts than one," while *greater* means "that which contains more parts," and the proposition is therefore equivalent to an analysis of the concept *whole*, and so is a particular application of the Law, *All Being is its own nature.*

Mathematics, then, rest on *analytical a priori* propositions. They add nothing to them save a

[1] I cannot refrain from quoting Mr. Mill's argument against the *a priori* necessity of numerical propositions, as an instance of that illustrious philosopher's method: "The expression 'two pebbles and one pebble' (he says, *Logic*, i. 289) and the expression 'three pebbles,' stand indeed for the same aggregation of objects, but they by no means stand for the same physical fact. . . . Three pebbles in two separate parcels and three pebbles in one parcel, do not make the same impression on our senses, and the assertion that the very same pebbles may, by an alteration of place and arrangement, be made to produce either one set of sensations or the other, though a very familiar proposition, is not an identical one. It is a truth known to us by early and constant experience; an inductive truth, and such truths are the foundation of the science of number."

This paragraph is an excellent example of Mr. Mill's style of argument. In order to prove that $2+1=3$ is a proposition learnt from experience, he turns his numbers into pebbles and arranges his pebbles into separate parcels. Then he puts the two parcels and the one parcel side by side and quietly says: "Don't you see that the two parcels produce a different sensation from the one parcel?" He quietly introduces external differences of place and arrangement and then appeals to these very differences to prove his point. Besides, it is not question of concrete and material facts present to sense, but of abstract truth present to the intellect. To bring in sensation and that which appeals to sensation is to bring in a confusing element which of itself renders the argument valueless.

system of abridged notation, which is only a special use of technical language. All the propositions of Pure Mathematics, even the most abstruse and complicated, are the elaboration of these first propositions, and are all ultimately reducible to the principle whence they proceed and on which they depend.

We have taken these instances from Mathematics partly because it is here that the attack is chiefly made, partly because mathematical truths come more directly than those of other sciences from the Law of Identity, without the intervention of the other primary laws of Contradiction, Causation, and Excluded Middle. But we desire to remind our readers that the same is true of all Propositions belonging to the strictly *a priori* sciences. In Theology, Ethics, Psychology, Metaphysics, there is no single proposition which may not ultimately be reduced to the Proposition—*Every Being is its own nature.* All *a priori* intuitions beyond this are condemned by the Law of Parcimony, which forbids unnecessary assumptions. Our conclusion therefore is that we are right in identifying analytical and *a priori* propositions on the one hand, and synthetical and *a posteriori* on the other, and this though there are some distinguished names opposed to us. The foundation of the error is the failure to recognize the universal parentage of the Law of Identity in the case of all propositions to which we necessarily assent as soon as the meaning of the terms is made known to us.

One difficulty remains. If all the propositions

of *a priori* science are but an analysis of the ideas we already possess, how is it that by reason of them we acquire fresh knowledge, and become informed of that of which we were ignorant before? It seems that we should never advance by sciences which add nothing from outside to our store of knowledge.

This objection is solved by the distinction between *implicit* and *explicit* knowledge. *Explicit* knowledge is that knowledge which we possess in itself, and of the possession of which we are fully conscious. *Implicit* knowledge is that knowledge which is contained in, or is deducible from, knowledge already possessed by us; but which we do not yet realize as existing in our minds. We have not yet deduced it from its premisses, or become aware of its reality.

To take a familiar instance. I have often asserted the proposition, nay, I regard it almost as a truism, that *All animals are possessed of feeling.* My acquaintance with zoology has moreover taught me that *All jelly-fish are animals.* These two propositions exist side by side in my intelligence. But I am staying at a watering-place facing the broad Atlantic, and one day, after a morning spent among my books, I go for a sail on the deep blue waters of ocean. As we scud along before the favouring breeze, we pass through a perfect shoal of jelly-fish floating in lazy helplessness on the surface of the water; and in a moment of mischief, I drive my iron-feruled stick right through the body of an unfortunate jelly-fish. After the performance of this feat, I remark half-inquir-

ingly to my companion: "I wonder if this jelly-fish feels being run through!" and I make the remark in all the sincerity of unsatisfied doubt. Yet all the time I was in full possession of the two premisses: *All animals are possessed of feeling. All jelly-fish are animals.* From which, by the simplest possible form of syllogistic reasoning, there follows the conclusion: *Therefore all jelly-fish are possessed of feeling.* But in point of fact I had never drawn that conclusion. My knowledge respecting the feelings of jelly-fish was implied in knowledge I already possessed, but was not unfolded or deduced from it as consequent from antecedent. It was *implicit*, not *explicit* knowledge, and as long as it remained in this implicit condition, it was unavailable for practical purposes.

When, however, reflecting on the matter, I call to mind the premisses above stated, and from these premisses proceed to draw their legitimate conclusion, when I have realized not only that all animals are possessed of feeling, and that all jelly-fish are animals, but also that all jelly-fish are possessed of feeling, then my knowledge enters on a new phase, it has become *explicit* instead of *implicit*. I am in possession of a fact that I had never made my own before. Every rational being has therefore an almost unlimited range of implicit knowledge. One who has mastered the axioms and definitions of mathematics, knows *implicitly* all Euclid, algebra, trigonometry, the differential calculus, pure mathematics in general. But he may not know a single proposition *explicitly*. They have

all to be unfolded, argued out step by step. By the study of mathematics no fresh facts are added to our intellectual stock-in-trade, but we learn to make use of facts unused before, to develope that which was previously undeveloped, to dig up stores of knowledge hitherto buried in our mental storehouse. This is one reason why mathematics are so valuable for educational purposes. They teach us how to avail ourselves of our existing knowledge, to employ properly an unlimited treasure lying hid within us, and useless to us before.

What is true of mathematics, is true of all the deductive sciences, of logic, ethics, theology, all branches of knowledge which start from general *a priori* principles, and argue down to particular facts. All their propositions are analytical, and therefore are truisms in disguise. But it is these truisms in disguise which make up the sum of all truth that is necessary, and immutable.

# CHAPTER V.

## THE FOUNDATIONS OF LOGIC (*continued*).

III. Principle of Causation—Various meanings of Principle—Cause active and immediate—Cause not invariable, unconditional, antecedent—Meaning of Event—Law of Sufficient Reason. IV. Principle of Excluded Middle—Mill on Laws of Thought—Mill's Principle of Uniformity in Nature—Fallacy of Mill's argument—Principle of Uniformity Derivative—Involves a *Petitio Principii*—Bain's Principle of Consistency—Its suicidal scepticism.

In our last chapter we discussed the Law of Identity in its relation to various kinds of Propositions. We saw that it necessarily regulates all thought and has a controlling power over every branch of knowledge. But we distinguished between the guiding influence that it exerts over Inductive or experimental sciences and the all-important position it occupies in the Deductive or *a priori* sciences, of which it is the fruitful parent as well as the supreme master. We pointed out the difference between *a priori* and *a posteriori* science and also between *analytical* and *synthetical* propositions. We then inquired into the truth of Kant's assertion, that the axioms of mathematics are at the same time *a priori* and synthetical propositions, and arrived at the conclusion that no such propositions exist, but that all the propositions of *a priori* science

are finally reducible by analysis to the principle that *Every object of thought is identical with its own nature.* Finally, in answer to the difficulty that if analytical propositions are mere Truisms they do not add to our knowledge, we examined into the distinction between *explicit* and *implicit* knowledge, and showed how useful a part is played by the analytical propositions of *a priori* science, and by the deduction of conclusions from their premisses, in rendering explicit and available the hidden fund of implicit knowledge which hitherto was practically useless to us.

We now come to the third of the Fundamental Laws of Thought.

III. PRINCIPLE OF CAUSATION.—The Principle of Causation may be stated as follows:

*Every event must have a cause;* or, *Everything that is of such a nature that it can begin to exist must have some source whence it proceeds;* or, *Every change implies Causation;* or, *Every product must have a producer.* What do we mean by the word *cause* in the Law that we have just enunciated? This is not the place to explain the various kinds of causes which exist in the world. But for the better understanding of our Law we must have a clear notion of the kind of cause the necessity of which it enunciates.

We are not speaking here of the *material* cause, or that *out* of which the object is made, as the marble of a statue; nor of the *formal* cause, or that which gives to the material its determinate character, as the design present in the sculptor's mind and

expressed in the material statue; nor of the *final* cause, or the end for which the object is made, as the amusement or profit of the sculptor. We are speaking here of the *efficient* cause alone, of that by the agency of which the object is produced, the sculptor using the chisel as the instrument of his work.

When, therefore, we say that *every event has a cause*, we mean that everything that comes into existence in the world must be the result of some active agent whose agency has produced it. This notion of *cause* we derive from our own activity. We are conscious of being able to bring into being that which did not exist before, and thence we derive our general notion of *efficient cause*. We transfer our experience of that which takes place in ourselves to the agents around us, and assign to them the same sort of efficiency, whatever it may be, which enables us to produce new results.

Moreover, in every event that takes place there is always some one agency or set of agencies which by common consent is regarded as the *cause* of the event. When a surgeon gives a certificate of the cause of death, he states, not all the predisposing circumstances which ended in death, but that one circumstance which directly and proximately brought about the fatal result. He does not state all the unfavourable circumstances antecedent to death. He simply chooses one of them which was the one most prominent in producing the result. Death may have been the resultant of a number of circumstances. the absence of any one of which

would have prevented its occurrence. The patient may have inherited a weakly constitution from his parents, he may have had an attack of rheumatic fever some months previously, he may have been for some time working at an unhealthy trade, but the physician does not enumerate these when he states the cause of death. He states only the *immediate* cause. Beside this, at the time of death, a number of unfavourable coincidences may have concurred to the effect. The patient may have been insufficiently protected against the cold, he may have been in a violent perspiration when suddenly exposed to it, he may have been weakened by want of sufficient food, but of these the certificate of death as a general rule says nothing. They are *predisposing circumstances*, but they are not *active agents* in producing the result. The one circumstance given as the *cause* of death is acute congestion of the lungs, because this, according to the ordinary use of terms, was at the same time the *immediate* and the *active* cause of death.

Mr. Mill, in his chapter on Causation, attempts to throw dust into the reader's eyes by keeping out of sight these two characteristics of an efficient cause, viz., *immediate* influence and *active* influence. He tells us, for instance, that we speak of the absence of the sentinel from his post as the *cause* of the surprise of the army, and that this, though a true cause according to common parlance, is no true *producing* cause. But his instance is a most misleading one. The surprise of the army is another name for the unexpectedness of the enemy's arrival,

and this is a negative idea. But a negative idea is no event which comes into being. It simply states the absence of a certain event, which in the instance brought forward, is the previous expectation of the foe, and its absence is accounted for by the absence of that which would otherwise have produced the effect, viz., the presence of the sentinel at his post, who would under ordinary circumstances have given notice of the enemy's approach. The *sentinel* would have been the *efficient* cause of the *notice*, but the *absence of the sentinel* cannot be called the *efficient cause* of the *absence of the notice*.

Similarly, when we say that the *cause* of the stone's fall is the stone's weight, we do not mean that the weight of the stone was the *agent* which produced its fall. What we really mean is that the attraction exercised by the earth according to the law of gravitation, was the cause of its fall. But this idea is not sufficiently popularized to have as yet passed into common parlance. Just as the motion of the earth does not prevent us from following appearances rather than realities, and saying that the sun has risen, so the fact that the active agent is the attraction of the earth rather than the stone, does not prevent us from following appearances rather than realities, and saying, in common parlance, that the weight of the stone is the cause of its fall.

*Cause therefore does not mean invariable, unconditional antecedent*, for this ignores altogether the necessity of *active* influence in producing the effect.

It ignores the dependence implied in the very word *effect*. To say that the effect is that which invariably and under all possible, as well as actual, circumstances follows on the cause, and that they are merely two detached facts which co-exist in the order of succession, is to belie the common consensus of mankind and the very meaning of words. *Cause* implies an activity in working out the effect, a positive energy exerted in its production. Those who would reduce our conception of cause to the sense assigned to it by Mr. Mill ought in consistency to declare that all things which come into existence come into existence of themselves, for, if effect does not imply the activity of an efficient cause, if that which is produced no longer needs a producer, the only alternative open to us will be that the effects achieved the task of being authors of their own being, and that all things which are produced are self-produced.

But we are not here treating the subject of Causation *ex professo*. We are merely explaining what we mean by cause in the Law of Causation. Unless this is clearly understood, the source from which our law arises will not be sufficiently apparent.

The Law of Causation, when carefully examined, turns out to be the application to a special case of the Law that *Every Being is its own nature.* The idea of *efficient cause* is contained in the idea of what is called *Inceptive* Being, or Being which is of such a nature that it can begin to exist. It makes no difference whether we call it event,

effect, or change. The simplest form of this Law is the proposition: *Every effect has a cause;* which is equivalent to the proposition: *Every effect is something effected or brought into being by an efficient cause;* and this is merely a particular application of the proposition: *Every being is identical with its own nature.* If for *effect* we substitute *event*, the *nexus* between the subject and predicate is a little less apparent. *Event* is a fact or circumstance which *proceeds from* certain pre-existing fact or facts. The mere word *event* no less than *effect* implies that it has not existed from all eternity (or at all events need not have existed from all eternity),[1] and that it is dependent for its being on its antecedent (in time or at least in nature), that it comes from it, owes its being to it, is brought into existence by it. The antecedent therefore from which it proceeds, of which it is the *event* or result, is not *merely* its *antecedent* but its *cause*, to whose agency its existence as an event is due. Hence in the form, *Every event has a cause*, it may be reduced to the above Law, no less than in the forms previously stated.

This Law is sometimes stated in another form and invested with another name. It is sometimes called the *Law of Sufficient Reason*, and expressed in the formula: *Everything existing has a sufficient reason*, or, *Nothing exists without a sufficient reason.* The Law as thus formulated has a wider range than the Law of Causation. The Law of Causation is

[1] This qualification is necessary on account of the opinion of St. Thomas, that we cannot say that the creation of the world from all eternity is intrinsically impossible.

applicable only to things which are created, the Law of Sufficient Reason to God the Creator as well. He alone of all things that exist is uncaused. The existence of God, though it has no cause, has a sufficient reason in Himself. But the existence of God is not a primary fact of Reason, and the law which professes to account for His existence is not one of the primary Laws of Thought. We have first to prove the existence of a First Cause by independent arguments. Having done this, and having previously proved that all things save the First Cause have a cause or reason of their existence outside of themselves, we are able to extend our Law to all things whatever. After proving that all things save God have a sufficient reason in the efficient cause outside of themselves, and that God as the First Cause has a sufficient reason of existence in Himself, we combine the Creator and His creatures under the universal Proposition, *All things that exist have a sufficient reason.* But this Proposition is no axiom or First Principle. It is a complex Proposition which unites in itself the axiom, *Every effect has a cause,* with the derivative Proposition, *The First Cause is Its own effect.*

The reader will observe that the Law of Causation does not state (as some modern writers most unfairly would have us believe) that *Everything that* exists *has a cause.* In this form it is quite untrue, since God is uncreated and uncaused. If it were worded thus, the objection, that we first formulate our universal law and then exclude from it Him on Whom all existence depends, would be perfectly

valid. But this is entirely to misrepresent our position. It is one of the unworthy devices of the enemies of *a priori* philosophy.

IV. PRINCIPLE OF EXCLUDED MIDDLE.—The fourth and last of these primary Laws of Thought is the Principle of Excluded Middle. *Everything that is not A is not-A;* or, *Every object of Thought is A or not-A;* or, *Whatever is excluded from A is included in the contradictory of A;* or, *Any two contradictories exhaust the whole field of thought;* or, *Between two contradictories there is no third alternative;* or, *Of two contradictories one or the other must be true.*

This law, in all its various forms, is but an immediate application of the Principle that we have described as the foundation of all demonstration. If we analyze the meaning of *contradictory*, we shall find that it means, in reference to any concept, *whatever is not included in it.* If we analyze *not-A*, we find as the result of the analysis *not A*. Hence our law will run: *The contradictory of any object is that which is not included in that object.* This is but a particular application of the general law: *All Being is identical with its own essence.* The other forms of the Law are but the same proposition couched in different language, and hidden under more complex words.

But in whatever form it be announced, we must be careful that our two alternatives are contradictories strictly speaking, else they will not exhaust the whole field of thought and the axiom will appear to fail. Thus *holy* and *unholy*, *faithful* and *unfaithful*, *easy* and *uneasy*, are not contradictories, but con-

traries, and it is not true to say that *Everything is either holy or unholy.* A table or an elephant or a syllogism is neither holy nor unholy. But it is true to say that: Everything is either *holy* or *not holy,* since *not holy* means *not possessed of the attribute of holiness,* and this holds good of a table or a syllogism just as much as of a wicked man.

These four fundamental principles of all thought are not accepted by the modern experimental school of whom John Stuart Mill is the most prominent representative among the English-speaking nations. The philosophy of experience professes to start from a different basis altogether. It asserts the Laws of Identity, Contradiction, and Excluded Middle to be not *primary,* but *derivative.* They are but conclusions arrived at from one universal axiom which lies at the foundation of all thought, of all investigation of Truth, of every intellectual process whatever. This new sovereign which is set up in the place of the time-honoured monarchs of the past, is the so-called *Principle of the Uniformity of Nature's action.* "This universal fact (says Mill), which is our warrant for all inferences from experience, has been described by different philosophers in different forms of language: that the course of nature is uniform: that the universe is governed by general laws. By means of it we infer from the known to the unknown: from facts observed to facts unobserved: from what we have perceived or been directly conscious of, to what has not come within our experience."[1]

[1] Mill, *Logic,* I. 343, 344.

But the Principle of the Uniformity of Nature, in spite of its world-wide dominion, is not, in the opinion of Mr. Mill and the school of experience, a monarch ruling by any *a priori* right or inherited claim to power. We will give the Theory of the Experimental School in their own language, and will try and state it with a fairness that we think none can question.

'The Principle of the Uniformity of Nature,' they say, 'is not, like the old-fashioned axioms of Contradiction and Identity, supposed to be antecedent of its own nature to all experience. On the contrary, it has no authority whatever beyond that which it derives from experience. It rules only in virtue of its nomination to sovereignty by the voice of experience. It is the elect of the people, chosen by the unanimous vote of all the particular instances which exist on the face of the earth.

'Not that this vast constituency can ever be marshalled to assert its sovereign will. The Law of Uniformity appears in and through certain selected representatives who have authority to speak on its behalf, and who in their turn elect other subordinate rulers entitled Laws of Nature, on whose partial authority, limited to their own sphere, rests the universal law which knows no limits in the existing Universe. Among these subordinate Laws of Nature, the School of Experimental Philosophy classes the Axioms of Contradiction, Identity, Causation, and Excluded Middle. These are experimental Truths, generalizations from experience, inductions from the evidence of our

senses. They receive confirmation at almost every instant of our lives. Experimental proof crowds in upon us in endless profusion; the testimony in their favour is so overpowering, they become so deeply engraved upon our minds, that after a time we regard the contradictory of them as inconceivable. They are so familiar to us that they become almost part of ourselves, and we regard as primary and *a priori* axioms what are merely the results of our uniform experience.'[1]

But these inductions do not stop short at any Axioms of Laws of Nature save one which is the foundation of the rest. The fundamental Principle of Uniformity, which rules every Induction, is itself an instance of Induction, not a mere explanation of the Inductive process. It is a generalization founded on prior generalizations. It expresses the unprompted tendency of the mind to generalize its experience, to expect that what has been found true once or several times and never has been found false, will be found true again. It is thus the basis of all our knowledge, the necessary condition of all Truth.

But how is this all-important principle attained to in the Experimental System of Philosophy? It cannot be an immediate truth, an instinct which is born in us, but of which we cannot give any rational account, a mere blind and unaccountable conviction which we must assume as true without any attempt to prove it. Whatever Reid and certain other philosophers of the last century may have asserted respecting it, the modern experi-

[1] Mill, *Logic*, I. 260, seq.

mental school eagerly and very rightly repudiate any such groundless assumption; on the contrary, it is only arrived at gradually by a careful process of observation and experiment. We begin with observing that a certain consequent always follows a certain antecedent in a certain limited sphere of our experience. We cannot, however, on the ground of this observed sequence, assert any invariable dependence of the consequent on the antecedent. The connexion between the two must be tested by a series of processes known to us as the *Methods of Induction*, and of which we shall have to speak hereafter. By means of these processes we must separate off those cases in which the consequent depends on the antecedent, from those in which the presence of both antecedent and consequent follows from certain co-existing circumstances on which both depend. By these means we are able gradually to extend the sphere within which the sequence holds good. By eliminating whatever fails of satisfying the required conditions, we are able to declare, with a continually increasing confidence, that not only under the circumstances observed, but under all circumstances actual and possible, the consequent will make its appearance wherever the antecedent is to be found. What was at first a mere empirical law has now become a law of nature, a well-established generalization, which declares the dependence of the consequent on the antecedent to be invariable and unconditional, and that the relation between the two is therefore one of the antecedent Cause to consequent Effect.

It is from the study of these generalized uniformities, these Laws of Nature, that we advance to that one all-embracing Law, that generalization founded on all previous generalizations, which is called the *Law of Causation*, or more properly speaking, the *Law of Nature's Uniformity of Action*, which asserts that throughout the whole of the known universe there is an unbroken uniformity in Nature by reason of which every event has a cause, and the same cause is always followed by the same effect. The Law of Causation is thus no *a priori* law, no instinctive assumption incapable of proof. It is no conclusion arrived at from a mere enumeration of affirmative instances. It is based on a long and careful induction. It is the major premiss of all inductions, yet itself the widest of all inductions. It is not the result of any mere formal inference, but of an inference carefully tested by methods which ensure its validity as a method of legitimate proof. It is arrived at by generalization from many laws of inferior generality. We never should have had a notion of Causation (in the philosophical meaning of the term) as a condition of all phenomena, unless many cases of causation had previously been familiar to us.

Thus by a process of "informal inference" we mount up step by step from our first observed uniformities, limited and unreliable outside their own sphere, to a firmly-grounded conviction of that final and all-embracing uniformity which pervades the whole world. The proposition that *The course*

*of nature is uniform*, while it is the fundamental principle of all Inductions, is itself an instance of Induction, and Induction of by no means the most obvious kind. It is one of the last inductions we make, or at all events, one of those which are latest in attaining strict philosophical accuracy.[1]

Such is the account given by the experimental philosophy of the all-pervading Principle of the Uniformity of Nature, and of the means by which it is arrived at. At first sight it appears plausible enough, and when stated by Mr. Mill with that power of clear exposition and apt illustration by which he conceals from the reader the underlying fallacies of his system, it is difficult not to be led away by his well-chosen language and attractive style. But when we look closely into the processes by which instances are tested and laws deduced from facts, we find that it is unhappily exposed to the fatal objection, that it implies from the very outset the existence of the very Law which it professes to prove. It covertly assumes from the beginning the truth of its final conclusion. Warily indeed and stealthily does it impose upon us the carefully disguised *petitio principii* that it involves—nay, with ingenious but not ingenuous candour the Coryphæus of the school warns his readers[2] that the process of his argument at first sight seems to be liable to this very charge. He takes the wise precaution of guarding himself against attack by pointing out an apparent weakness on a subordinate point where in truth there is no weakness

[1] Mill's *Logic*, I. 343—401, and passim. [2] Mill, *Logic*, II. 95.

at all, and thus he seeks to divert the assailant from the real weakness which is inherent in his whole system. We must try and explain, in as few words as possible, where lies the vulnerable point of this carefully-guarded Achilles.

It is quite true, as Mr. Mill remarks, that there is no *petitio principii* in the early assumption that cases in which the general law is obscure really come under it, and will on closer investigation make it manifest as the principle underlying them. This assumption is a necessary hypothesis to be afterwards proved. Here the process is unassailable. But it is in the course of the investigation, in the proof by which the existence of the universal Law is established, that the unwarranted assumption is made. The test by which a true dependence of consequent on antecedent is distinguished from one which exists only in appearance, *is one that assumes that very dependence as an existing reality.* When the experimentalist asserts that he is going to lay down certain tests to discover *where* the Law of Causation is at work, he thereby implies the *existence* of the Law. The distinction between sequences which depend on the antecedent, and sequences which depend on other co-existent circumstances, has no meaning whatever unless we assume that the Law of Causation prevails throughout the Universe.

If I formulate a series of tests which are to distinguish between inherited and acquired tendencies, and to mark off real instances of inheritance from those which are so only in appearance,

I thereby assume that there is the law of Heredity prevalent in the world. If I explain in detail the various characteristics which separate real gold from ormolu; if I propose a number of unfailing signs of the genuine metal which are lacking in the counterfeit; if I say that true gold is not affected by hydrochloric acid, that it is of greater weight than any of its imitations, and that it is malleable to an extent unknown to any other metal; I am all the time taking it for granted that such a thing as real gold exists. If, after the distinction is made in a number of instances by means of the tests proposed, I go on to argue that it is evident that true gold exists because it fulfils the tests, I am obviously arguing in a circle.

In just the same way, the methods which Mr. Mill has rendered famous assume beforehand that for every consequent there is a cause, or, as he calls it, an invariable unconditional antecedent, and that we have only to pursue with deliberate care the methods proposed in order to recognize the connection between antecedent and consequent in each individual case. We are to begin by looking out for "regularity" in particular instances as the test by which we are to recognize them as coming under the universal law and forming subordinate examples of it, and when we have collected the instances and formulated the law, we are expected to turn round and say with all the joy of a hardly-won discovery in the field of Thought: See how the Law of Causation which establishes for us the Uniformity of Nature is proved by our universal experience!

quite forgetting that the treasure which we profess to have come upon thus unexpectedly and which is to enrich all future ages, is but one which we ourselves had brought and hidden there, taken out of the very storehouse where we are now proposing to lay it up in triumph.

The fallacy which thus underlies the First Principle of the so-called Experimental Philosophy naturally vitiates the whole system from first to last. There is not a corner of the house that these philosophers have built up where we can rest with safety. They have put together their bricks and rubble into a solid mass on which the superstructure rests, but what is the basis on which reposes the foundation of the edifice? It is the workmanship and the excellency of the selected bricks which is supposed to provide a secure foundation. But however well chosen the bricks, they cannot remain suspended in mid-air. They cannot develope for themselves a basis out of their own activity. Yet this is the aim of the experimentalist. Given his methods of inquiry and he engages to create or manufacture therefrom a First Principle which shall be at the same time the foundation and the culminating-point of all philosophical inquiry.

It was not to be expected that the other Primary Axioms which underlie all processes of Thought would fare any better at the hands of the Experimentalists than the Law of Causation. Just as this Law is to be built up by a process which takes it for granted, so the Law of Contradiction is arrived at by another process which in just the same way

has already assumed as true the very point that we have to prove. We will quote Mr. Mill's account of it in his own words. Speaking of the Law of Contradiction, he says: "I consider it to be like other axioms, one of our first and most familiar generalizations from experience. The original foundation of it I take to be, that Belief and Disbelief are two different mental states, excluding one another. This we know by the simplest observation of our own minds. And if we carry our observation outwards, we also find that light and darkness, sound and silence, motion and acquiescence, equality and inequality, preceding and following, succession and simultaneousness, any positive phenomenon whatever and its negative, are distinct phenomena, pointedly contrasted, and the one always absent where the other is present. I consider the maxim in question to be a generalization from all these facts."[1]

Now, in the very statement of my conviction that belief and disbelief are mental states excluding one another; in the mental assertion that light and darkness, sound and silence, &c., are incompatible; I have already implicitly assumed the very principle at which I am supposed to arrive by the observation of my own mind, or by an argument from my own experience. If the Proposition *Belief excludes Disbelief*, is to have any value whatever, I must intend, at the same time, to deny the compatibility of Belief and Disbelief, else my Proposition is simple nonsense. If I declare that it is the result of

[1] Mill's *Logic*, Vol. I. pp. 309, 310.

my experience that *light expels darkness*, such a declaration has no force if it may be equally true that *light does not dispel darkness*. Unless contradictions exclude one another, no statement that we make is of any value whatever. As we have seen above, the Law of Contradiction is already implied in every possible statement made by any rational being, and therefore to establish its validity by means of certain propositions we are to derive from experience is a still more obvious fallacy than that by which the Empirical Philosopher seeks to arrive at the Law of Causation and the Uniformity of Nature.

We shall have to recur to the Experimentalist Theory of Axioms when we come to discuss the nature of Induction. We will close our present chapter with a few words on another Universal Axiom set up by one whose doctrines are closely akin to those of Mr. Mill.

Mr. Bain includes under one head the three Principles of Identity, Contradiction, and Excluded Middle. They are all of them "Principles of Consistency," inadequate expressions of the general law that is in our reasoning as well as in our speech, that "What is affirmed in one form of words shall be affirmed in another." This principle, he says, and says with truth, requires no special instinct to account for it; it is guaranteed by the broad instinct of mental self-preservation. But when he goes on to add that "it has no foundation in the nature of things, and that if we could go on as well by maintaining an opinion in one form of words,

while denying it in another, there appears to be nothing in our mental constitution that would secure us against contradicting ourselves," he exhibits in a still more undisguised and open form, the scepticism which underlies the system of Mr. Mill. If the Axioms of Consistency are Axioms of Consistency alone, and not of Truth, if they express merely the subjective tendencies of our own minds, and not any external reality, Truth disappears altogether from the Philosophy which is based on such foundations as these. We have already seen that the new basis which both philosophers attempt to substitute in the Uniformity of Nature's laws ascertained by our own experience, involves the fallacy of assuming by way of proof the very conclusion which is finally arrived at. The Principle of Consistency adds nothing new to the system enunciated by Mr. Mill, save a novel and plausible method of throwing dust into the eyes of the unwary.

## CHAPTER VI.

### THE THREE OPERATIONS OF THOUGHT. I. SIMPLE APPREHENSION.

Recapitulation—The three operations of Thought—Simple Apprehension, Judgment, Reasoning—Three Parts of Logic—Terms, Propositions, Syllogisms—Simple Apprehension—The steps leading to it—Previous processes—Abstraction—Abstraction and Simple Apprehension—The Concept an Intellectual image—The Immaterial Phantasm and Concept—Phantasm and Concept contrasted—Concept not pictured in the imagination—Concept ideal and spiritual—Concept accompanied by Phantasm—Points of difference between the two—Common Phantasms—Their individual character—Their origin—Common Phantasm counterfeit of Universal idea.

WE must recapitulate the substance of our last two chapters before we proceed. We commenced by laying down the Law of Contradiction and the Law of Identity. The latter we described as the basis of all positive reasoning and the parent of all *a priori* Propositions. From these Primary Laws we passed on to another fundamental Law, the Law of Causation, defining carefully what sort of a cause is alluded to in it. Last of all we laid down the Fourth of this compact family of First Principles, the law of Excluded Middle which, like the Law of Causation, proceeds immediately from the Law of Identity. We then examined the First

Principle, which Mr. Mill and the Experimental School propose to substitute for the Laws above stated, and we detected in the process by which he establishes it, the unfortunate fallacy of assuming implicitly the very proposition which it professes to prove.

Having thus laid our foundations, we must now commence the building up of our Logical Edifice

We have already seen that Logic is a science which is concerned with the operations of Thought, and the Laws that regulate them. In the beginning of our inquiry,[1] we ascertained that every exercise of thought, properly so-called, consists in *apprehending*, *judging*, *reasoning*. We have now to examine into the nature of these three operations, since with them, and them alone, is Logic concerned.

The First of these operations of Thought is called *Simple Apprehension*, or *Conception* (νόησις).

The Second is called *Judgment*, or *Enunciation* (ἀπόφανσις).

The Third is called *Reasoning*, or *Deduction*, or *Discourse* (συλλογισμός).

1. *Simple Apprehension* is that operation of Thought by which the object presented to us is perceived by the intellectual faculty. It is called *Apprehension*, because by means of it the mind, so to speak, apprehends or takes to itself the object; and *Simple* Apprehension, because it is a mere grasping of the object without any mental statement being recorded respecting it. It also bears the name of *Conception*, because the mind, while it apprehends the external

[1] P. 6.

object, at the same time *conceives* or begets within itself the object as something internal to itself, in so far as it is an object of Thought.[1]

2. *Judgment* is that operation of Thought by which the identity or diversity of two objects of Thought is asserted, by which one object of Thought is affirmed or denied of another. It is called *Judgment*, because the intellect assumes a judicial attitude, and lays down the law, or judges of the objects before it.

3. *Reasoning*, or *Deduction*, or *Inference*, or *Argumentation* (or as it is called in Old English *Discourse*), is that operation of Thought by which the mind infers one judgment from another, either immediately, or mediately, by means of a third judgment. It is called *Reasoning*, inasmuch as it is the exercise of the faculty of human *reason*; *Deduction*, inasmuch as it is a drawing (*de ducere*) of one judgment from another; *Inference*, inasmuch as

[1] The word *Conception* is liable to mislead the unwary student, especially if he has first encountered it in a non-Catholic text-book. Almost all modern schools of philosophy outside the Church describe conception as deriving its name from their own false account of the process. They make it an act of the *imagination*, not of the *pure intellect*, of a faculty which is dependent on matter, not of one which is wholly immaterial. Hence they represent it as a gathering together, a taking into one (*con capere*) of the various attributes, which we discover in a number of different objects, and which, according to them, we unite together to form the intellectual notion which stands for each and all of them, and represents their common nature. We shall have to refute this error presently in speaking of the process of Simple Apprehension, and of the nature of Universals; at present we simply direct the attention of the reader to the false theory which the word *Conception* is quoted to confirm.

it brings in (*infert*) a judgment not made explicitly before; *Discourse*, inasmuch as it is a running hither and thither of our minds (*dis currere*) in order to arrive at truth.

Each of these operations of Thought has moreover a certain result or product which it engenders within the mind. This is the end or object to which it tends, the child of which it is the intellectual parent.

*Simple Apprehension* (ἐννόησις, ἔννοια) engenders the *idea* or *concept* (ἐννόημα) which is so called as being the mental likeness, or aspect, or appearance (ἰδέα) of the external object which Thought *conceives* within the mind.

*Judgment* (ἀπόφανσις) engenders the *judgment* or *declaration* (λόγος ἀποφαντικὸς, or ἀπόφανσις) which derives its name from its being the *declaration* or *setting-forth* of the agreement or disagreement between two objects of Thought.

*Reasoning* (τὸ λογίζεσθαι, διάνοια) engenders the *argument* (συλλογισμός), or *conclusion* (συμπέρασμα), or *inference*, the various names of which express the fact that it *proves* (*arguit*) some point, that it *reckons together* (σὺν λογίζεται) two judgments from which it deduces or infers the conclusion following from them.

The Science of Logic therefore naturally divides itself into three parts, corresponding with the three operations of Thought.

Part I. treats of Simple Apprehension, or Conception, or Thought, apprehending its object, and thus engendering the concept or idea.

Part II. treats of Judgment, or Enunciation, or Thought, pronouncing sentence, and thus engendering the declaration.

Part III. treats of Reasoning, or Deduction, or Inference, or Thought deducing one judgment from another, or thus engendering the argument.

But the task of Logic does not end here. Thought must find expression in words. The very Greek equivalent of *Thought* (λόγος) stands equally for the verbal expression of Thought. Without some sort of *Language* Thought would be, if not impossible, at least impeded and embarrassed to a degree which it is difficult for us to estimate. We should lack a most valuable instrument and auxiliary of Thought. We should not be able to communicate our thoughts to each other, or to correct our own mental experiences by the experience of others. Thought and language are mutually dependent on each other. A man who talks at random is sure also to think at random, and he who thinks at random is on the other hand sure to be random in his language. In the same way accuracy of Thought is always accompanied by accuracy of language, and a careful use of words is necessary to and promotive of a careful and exact habit of thought.

Logic, then, is indirectly concerned with Language; its subject-matter being the operations of Thought which find their expression in language. It has to deal with Language just so far as its interference is necessary to secure accuracy of Thought, and to prevent any misuse of words as symbols of

Thought. Just as one who is entrusted with the training or care of the minds of the young, cannot pass over or neglect the care of their bodily health, if the mind is to be vigorous and healthy in its action, so a science which has jurisdiction over Thought, cannot afford to leave unnoticed the external sign or symbol in which Thought finds expression, and with which it stamps its various products.

Hence the first part of Logic treats of the *Concept* as expressed in the spoken or written *Word* or *Term;* the second part, of the *Judgment* as expressed in the *Proposition;* the third, of the *Argument* as expressed in the *Syllogism.*

## PART I.—OF SIMPLE APPREHENSION OR CONCEPTION.

*Simple Apprehension* or *Conception* is that operation of Thought by which the intellect apprehends some object presented to us. It is the act by which we attain to a general and undefined knowledge of the nature of the object, and have present to our mind in a general way that which makes it to be what it is, leaving a more specific knowledge, a knowledge of its essence in its details, to be gained by subsequent reasoning and reflection. It includes no sort of judgment respecting the object thus apprehended, except, indeed, the implicit judgment that it contains no contradictory attributes, since anything which contradicts itself is *inconceivable,* that is, cannot be grasped by the mind as an actual or possible reality. It is the *intellectual*

*contemplation of the essential attributes of the object; the perception of its substantial nature.*

We are not concerned with any elaborate analysis of the process itself, since this falls rather under Psychology than under Logic; but for clearness' sake, we must briefly summarize the various steps by which the *concept* is reached, and the inner nature of the object apprehended by the human intellect.

When any object is presented to us, and we turn our minds to the consideration of it, the first thing that comes before us is the sensible impression made upon the inner sense or imagination. There is painted upon the material faculty of the imagination an image, more or less distinct, of the object to which we turn our attention. This image is either transferred from our external senses to the faculties within us, or else is reproduced by the sensible memory recalling past impressions. If any one says to me the word "pheasant," and I hear what he is saying, a vague general picture of a pheasant, copied from the various pheasants I have seen, is present to my imagination. So far, this is no strictly intellectual process. Animals share with man the faculty of imagination, and can call up from their memories a vague image of familiar objects. When I scratch unperceived the floor of my room, and call out to my terrier, "Rat!" there rises up in his mind an indistinct picture of the little animal that he loves to destroy. When the foxhound comes across the fresh scent on the path which Reynard has but recently trodden, the con-

fused image of a fox comes up before him, and suggests immediate pursuit. All this is a matter of the interior sense; for there is no intellectual activity in the lower animals; they rest on the mere sensible impression and cannot go beyond it.

But an intellectual being does not stop here. The higher faculties of his rational nature compel him to proceed a step further. He directs his intellectual faculties to the sensible image and expresses, in his intellectual faculty, the object which caused the image, but now in an immaterial way and under an universal aspect. This character which the object assumes in the intellect is the result of the nature of the intellect. *Quicquid recipitur, recipitur secundum modum recipientis.* Whatever we take into any faculty has to accommodate itself to the nature of that faculty. Whatever is received by the intellect must be received as *supra-sensible* and *universal.* I mean by *supra-sensible* something which it is beyond the power of sense, outer or inner, to portray, something which cannot be painted on the imagination; something which belongs to the immaterial, not the material world. I mean by *universal* something which the intellect recognizes as capable of belonging not to this or that object only, but to an indefinite number of other objects, actual or possible, which have the same inner nature, and therefore a claim to the same general name. The *individual* representation or *phantasm* which belongs to sense and to sense alone, is exchanged for the *universal* representation, or *concept*, or *idea*, which the intellect

alone can form for itself by the first operation of Thought properly so called.

We shall perhaps be able better to understand the process of Simple Apprehension if we distinguish it from certain other processes which either are liable to be mistaken for it, or are preliminary steps which necessarily precede it.

1. *Sensation*, the act by which we receive on some one or more of the external organs of sense, the impression of some external object presented to it. The object producing the sensation may be altogether outside of us, or it may be a part of our own bodies, as when I see my hand or feel the beatings of my pulse.

2. *Consciousness*, the act by which we become aware of the impressions made upon our senses and realize the fact of their presence. Every day a thousand impressions are made upon our bodily organs which escape our notice. We are not conscious of their having been made. We have heard the clock strike with our ears, but have never been conscious of the sound. When our mental powers are absorbed by some interesting occupation, or by some strong excitement, almost any sensation may pass unnoticed. In the mad excitement of the battlefield men often receive serious wounds and are not aware of the fact till long afterwards.

3. *Attention*, by which the faculties are directed specially to one object, or set of objects, to the partial or complete exclusion of all others. The dog following the fox has his attention directed almost

exclusively to the fox he is pursuing and seems to forget all else. The soldier in battle has his attention absorbed by the contest with the foe, and for this reason his wound passes unobserved.

4. *Sensible perception*, the act by which the data of the external senses are referred to an inner sense which has the power of perceiving, comparing together, and writing in one common image, all the different impressions made on the various organs of sense; whence it obtains the name of the "common sense" (*sensus communis*). Sensible perception always implies some sort of consciousness and memory. A dog sees a piece of sugar; this draws his attention to it and he becomes conscious of the impression (using the word in a wide sense) upon his organs of sight. Next he smells it, and if not perfectly satisfied as to its nature, applies his tongue to it to discover its taste. He then compares together the various impressions of sight, smell, and taste, by an act of *sensible perception*, and the resulting image is that of a piece of sugar good for food.

5. *Memory* (sensible), which recalls the past by reason of the presence within us of certain sensations which recall other sensations formerly experienced. A certain perfume recalls most vividly some scene of our past lives; a familiar melody stirs emotions long dormant; the fresh morning air brings with it the remembrance of some exploit of boyhood or of youth. The memory of animals is exclusively a sensible memory dependent on sensation.

6. *Imagination*, which paints upon the inner

sense some picture, the scattered materials of which already exist within us. It is the faculty which reproduces the sensible impressions of the past. It is able, however, to group them afresh, and to arrange them differently. In this it differs from the (sensible) memory which reproduces the impressions of the past just as they were originally made. In dreams the imagination is specially active.

Hitherto we have included in our list various processes which belong to the faculties of sense common to man and the lower animals. We now come to those which belong to man alone, to the processes of *Thought* strictly so called. We have said that the first and simplest of these is that of *Simple Apprehension* or *Conception*. But there is a preliminary process which is not really distinguishable from Simple Apprehension, and differs only in the aspect under which it presents itself to us.

We have spoken of *Attention* as a concentrating of our faculties on some one object to the exclusion of others. The object on which we concentrate may be an object having an independent existence, or it may be some quality or qualities out of the many qualities belonging to something which is present to our minds. In this latter sense it is often called *Abstraction*, inasmuch as it is the *drawing away* of our attention from some qualities in order to fix it upon others. I may abstract from the whiteness of a piece of sugar and fix my mind upon its sweetness. I may abstract from whiteness and sweetness and concentrate my attention on

its crystallization. I may abstract from whiteness and sweetness and crystallization and mentally contemplate its wholesomeness for little children.

But *Abstraction* has a further meaning which includes all this, and goes beyond it. In every object there are certain qualities which may or may not be there without any substantial difference being made in its character. There are others, the absence of any one of which would destroy its nature and cause it to cease to be what it is. A man may be tall or short, young or old, handsome or ugly, black or white, virtuous or vicious, but none the less is he a man. But he cannot be deprived of certain other qualities without ceasing to be a man. He cannot be either rational or irrational, living or dead, possessed of that form which we call human, or of some other entirely different one. If he is not rational, living, possessed of human form, he ceases to be a man altogether, because these latter qualities are part of his nature *as man*, constitute his essence, and make him to be what he is, a man.

Now, *Abstraction* in this further sense is the *concentration of the intellect on these latter qualities to the exclusion of the former.* It is the withdrawal of the mind from what is accidental to fix it upon what is essential, or, to give the word a slightly varying etymological meaning, it is the intellectual act by which I draw forth (*abstrahere*) from the individual object that determinate portion of its nature which is essential to it and is said to constitute its essence, while I neglect all the rest.

In this sense it is the same process as Simple

Apprehension regarded from a different point of view. It is called *Apprehension* inasmuch as the intellect apprehends or grasps the nature of the object. It is called *Abstraction* inasmuch as the nature is abstracted or drawn out of the object whose nature it is, and as it cannot be grasped until the intellect has drawn it forth from the object, Abstraction is, at least in thought, a previous process to Simple Apprehension.

Thus, when a horse is presented to me, *Abstraction* enables me to withdraw my mind from the fact of his being race-horse or dray-horse, chestnut or grey, fast or slow trotter, healthy or diseased, and to concentrate my attention on that which belongs to him *as a horse*, and thus to draw out of him that which constitutes his essence and which we may call his *equinity*. In virtue of my rational nature I fix my mental gaze on that mysterious entity which makes him what he is, I grasp or apprehend his equinity, I perceive intellectually that hidden something which is the substratum of all his qualities, the root whence the varying characteristics which mark him out as a horse all take their origin. It is in the assertion of this faculty of *Abstraction*, as the *power of drawing out of the object something which is really there independently of the mind that draws it forth*, that consists the whole distinction between scholastic and the so-called modern philosophy. It is in the definition of Simple Apprehension as not merely the grasping into one certain qualities of the object selected by the mind, but the grasping by the mind

of an *objective* reality in the object, whence certain qualities flow quite independently of the mind which apprehends them, that consists the central doctrine which gives to the philosophy of the Catholic Church a bulwark against the inroads of scepticism, impossible to any system which has lost its hold on this central and vital truth. Modern error starts with misconceiving the very first operation of Thought: with such a foundation we cannot expect the superstructure to be remarkable for solidity.

From the *process* of Simple Apprehension we must now turn to the *result of the process*, from the *act* to *that which the act engenders*, from *conception* to *the concept*.

We have seen that whatever is received into any faculty has to accommodate itself to the nature of the faculty, and consequently that the image of the external object received into the intellect must be something supra-sensible and spiritual. It has been grasped or apprehended by the intellect, and transferred so to speak into it, and it has consequently been purified of the materiality clinging to the image present to the imagination, and prepared for its abode in the sphere of immaterial Thought. It is thus no longer the representation of one single object and no more; it is now applicable to each and all of a whole class of objects; it is no longer a *particular*, it is an *universal*. It is not the sensible image stripped of those attributes peculiar to the individual as such and applicable to a number of objects by reason of its vagueness. It belongs to quite a different sphere; it is raised above the

region of sense to the region of intellect and of Thought properly so called.

This distinction between the two images—the sensible image painted on the imagination and the supra-sensible image dwelling in the intellect—is of the greatest importance. The sensible image must precede the supra-sensible; we cannot form a concept of any object unless there has been previously imprinted on the imagination a material impression of that object. The sensible image must, moreover, exist side by side with the supra-sensible: the one on the imagination, the other in the intellect; and as long as I am thinking of the intellectual concept, the material phantasm must be present to my imagination. This is the result of the union of soul and body; in virtue of my animal nature the phantasm is present to the material faculty, and in virtue of my rational nature the concept is present to the intellectual faculty. When I think of a triangle my intellect contemplates something which is above sense, the *idea* of triangle, an ideal triangle if you like, and at the same time my imagination has present before it the *material picture* of a triangle. The intellectual image is something clear, precise, exact, sharply marked without any defects or deficiencies. The material image is something vague, indistinct, indefinite, and applicable to a number of individuals only by reason of its indistinctness and indefiniteness. The intellectual concept I form of triangle is as precise as anything can be. I know what I mean in every detail belonging to it. I can define it and set forth all its characteristics

one by one with perfect correctness. The picture of "triangle" present to my imagination is the reverse of all this, it is dim, imperfect, undetermined. It is neither isosceles, rectangular, or scalene, but a sort of attempt to combine all these. If in order to give it definiteness, I picture not only triangle, but isosceles triangle, still I have to determine whether the angle at the vertex shall be an obtuse angle, a right angle, or an acute angle. Even if I introduce a fresh limitation and decide on the acute angle I am not much better off, my picture is still quite indeterminate, for the sides must be of a certain length, it must be drawn in a certain position, and some colour must be chosen for the sides. But however many limitations I introduce, I cannot be perfectly determinate until I have thrown away altogether every shred of generality belonging to the triangle and am satisfied with some one individual triangle with individual characteristics belonging to itself and to no other triangle in the world.

But there is another important distinction between the *immaterial concept* in the intellectual faculty and the *material phantasm* in the imaginative faculty. If I examine the latter I not only find that it is vague and indistinct, but that it is not a true representation of the object; it is not what it professes to be. The picture of triangle which is present in my imagination is not, strictly speaking, a triangle at all. For the sides of a triangle are lines, *i.e.*, they have length but not breadth, whereas in the picture of a triangle as imagined, or actually drawn, the sides are not lines at all, but good thick bars of

appreciable breadth. If they were lines they would be invisible, not only to the naked eye, but to the most powerful microscope. Worse still, they are not even straight; they are wavy bars with rough jagged edges. They have no sort of pretence to be called straight lines, nor has the so-called triangle any real claim to the name.

Not so the intellectual concept formed by the process of Simple Apprehension. The image is purged of its materiality when it is adopted by the immaterial faculty; it is also purged of all its indefiniteness and incorrectness. It is an ideal triangle; it is worthy of the noble faculty that has conceived and brought it forth. It is not a clumsy attempt at a triangle, with all the imperfections which cling to the figure depicted on the imagination, or drawn on paper or on wood; which for practical purposes serves the purpose of a triangle, but has no true lines for its sides, and is crooked and defective in every portion of it. It is a true, perfect, genuine triangle, dwelling in the spiritual sphere, the sphere of what philosophy calls *noumena*, things capable of being intellectually discerned, as opposed to *phenomena* or mere appearances. When I argue about the properties of a triangle, it is about this ideal triangle that I argue, else nothing that I said would be strictly true. I argue about something which in point of fact, has nothing corresponding to it in the world of phenomena, only feeble attempts to imitate its inimitable perfections. When I assert that an equilateral triangle has all its sides and angles equal, I do

not assert this in reality of the triangle A B C, or the triangle D E F, or any triangle that I have ever seen with my bodily eyes, but of an ideal equilateral triangle, which is not realized in the world of sense, but is realized with the utmost precision in the world of intellect. When I say that the radii of a circle are all equal, I do not mean that any circle has ever been drawn by the most skilful limner in which any two radii were ever exactly equal, but that in the ideal circle the ideal radii are actually equal, and that in the attempts to draw a circle on the blackboard, or on paper, or on the imagination, the so-called radii are approximately equal, in proportion as the circle approximates to an ideal circle, and the radii to the ideal radii of that ideal circle

It is true that the geometrician cannot pursue his researches without palpable symbols to aid him. This is the consequence of our intellect inhabiting a tenement formed of the dust of the earth. We cannot think of an ideal circle and its properties without at the same time imagining in vague fashion a circle which can be rendered visible to the eye. It is because of this that intellectual activity so soon fatigues. It is not the intellect which wearies, but the material faculty of the imagination which works side by side with the intellect. Very few men can argue out a single proposition of Euclid by means of a triangle present only to the imagination, and they therefore draw a picture which appeals to the external sense, in order to save their imagination the impossible task of keeping before the mind its own imaginary triangle. But whether

the symbol be drawn on paper or on the imagination, we must remember that it is not about the symbol that we argue, but about the corresponding image in the immaterial faculty, the ideal triangle present to the intellect

Before we discuss the strange aberrations of modern philosophy on this subject we must clearly mark the contrast between the two different images that we form of every object of which we speak or think.

1. There is the intellectual, immaterial image, present in the intellectual faculty. It is something ideal. It belongs to the spiritual world, not to the world of sense. It is engendered in man as the consequence of his being created in the Divine image, with an intellect framed after the likeness of the intellect of God. The intellectual image which he forms by the process of Simple Apprehension is a pattern or exemplar of the object which exists outside of him and corresponds (though at the same time falling infinitely short of its perfection) to the pattern or exemplar present to the Divine Mind when the external object was created. Man can idealize because he is a rational being and possesses within him this gift of recognizing the ideal of the object, such as we conceive to be present in the mind of God. Brutes cannot idealize because they are irrational and do not possess this likeness to God. Their mental faculties can apprehend only sensible phenomena as such; they cannot think of anything except so far as it can be depicted on the imagination and is palpable to sense.

2. There is, moreover, the sensible, material image present in the material faculty of the imagination. This necessarily accompanies the intellectual image so long as the body is united to the soul. We cannot think of any object whatever without the material picture of it or something resembling it being present to the fancy. This picture is sometimes vivid and distinct, as when I think of some individual object very familiar to me. Sometimes it is utterly faint and indistinct, as when I think of something which is applicable to a number of varying external objects. In proportion to the number and variety of these objects is the faintness and indistinctness of the image representing them. When I recall to my thoughts my favourite little Skye terrier Die, whose winning ways and clever tricks have imprinted her image on my grateful memory, the picture is clear and vivid, as if I saw her before me begging for the dainty morsel, or chasing the nimble rat just freed from the cage, over the meadows that border on the silver Isis or the sluggish Cam. But if I think of Skye terriers in general, the image becomes blurred; other Skye terriers, the associates and predecessors of the much beloved Die, come up vaguely before me. If I enlarge the circle and fix my mind on *terriers* as a class, the image becomes still more indistinct. Scotch terriers, Dandy Dinmont terriers, black-and-tan terriers have all a claim to be represented. The picture makes an attempt to comprise them all: but as it is individual, it can only do so by abandoning its clearness of detail

altogether. If I go still further afield and think of *dogs* in general, the picture lapses into a still more confused indefiniteness, and this again increases a hundredfold when the subject of my thought is no longer *dog*, but *animal*. In fact, we may say in general that the vividness and brightness of the material image varies in an inverse ratio to the simplicity of the concept.

But all this time the *concept* has remained clear and sharply marked. The intellectual image of *animal* is no less distinct than the intellectual image of Skye terrier, perhaps rather more so, inasmuch as we can define in precise terms what constitutes animal nature, but it is not so easy to expound what are the special and essential characteristics of a Skye terrier and constitute his peculiar nature as distinguished from that of other dogs.

But whether the picture painted on the imagination be distinct or indistinct, vivid and life-like or so faint and dim as to be scarcely perceptible; whether it be a real likeness of the object of thought, or merely a feeble attempt to give a *concrete* and *sensible* form to that which is *abstract* and *spiritual*, still an image of some sort is always there. When I think of *honesty*, or *truth*, or *courage*, some sort of dim image having some sort of relation (generally a very distant one) to the abstract quality present to my intellect paints itself without fail on the material faculty, just as certainly as when I think of Skye terriers or ocean steamers, or balloons. In the former case the resemblance of the image

to the object of thought is a very remote one, in the latter it is clear enough.

We cannot too strongly insist on the necessary and universal co-existence of the two images in the spiritual and material faculty respectively, nor at the same time can we too strongly insist on the points of contrast between them. There is just enough similarity to make the attempt to identify them a plausible one. It is scarcely too much to say that, as in the nobler animals there is something which is a sort of shadow of reason, and so nearly resembles reason that the *a posteriori* observer cannot discern any wide distinction between the intelligence of the dog and the intellect of the savage; in the same way the "common phantasm" is so respectable an imitation of the concept, that we can scarcely wonder that those who do not start from the solid foundation of philosophic truth have regarded the two images as identical.

We must first of all notice that they have this in common, that they are both applicable to a number of individuals; the phantasm has thus a sort of universality (counterfeit though it be) as well as the concept. We also notice that one cannot be present without the other, the intellectual image is always accompanied by its material counterpart. It is these two circumstances which have misled so many modern schools of philosophy, and involved them in the fatal mistake of confusing together the immaterial and the material, conception and imagination, the region of intellect and the region of sense. This unhappy confusion has in its turn

introduced the so-called Relativity of Thought, and has opened the door upon a boundless vista of contradiction and scepticism.

The points of contrast between concept and phantasm may be summed up under five heads.

1. The first difference between the *concept* and the *phantasm* is that the *concept* is received into the intellect, by the *process of conception* or *intellectual perception*, and as the intellect is a spiritual and immaterial faculty, removed altogether above sense, the concept too is a spiritual and immaterial and supra-sensible image.

The *phantasm*, on the other hand, is received into the imagination or fancy by the *process of sensible perception*, and as the fancy or imagination is a material and sensible faculty, the phantasm too is material and sensible.

2. The *intellect* is, moreover, a faculty of perceiving universals; its special function is to see the universal under the particular. It does not recognize the individual object directly and immediately as an individual, but only so far as it possesses a nature capable of being multiplied. Hence the *concept* is something *universal*, something which is found not in one individual alone, but in many, either really existing or at least possible. The *imagination*, on the other hand, is a faculty of *perceiving* individuals. All its pictures are pictures of individual objects as such. Hence the *phantasm* is also something *individual* and limited to the individual. It is a picture of the individual object, or of a number of existing individuals whose points of distinction are ignored

in order that they may be depicted in one and the same individual image.

3. The *concept*, which is common to a number of objects of thought, is something precise, definite, distinct, capable of analysis. The *phantasm* which represents a number of objects of thought is something vague, indefinite, indistinct, incapable of exact analysis. It fades away before my attempt to analyze or define it. I can explain and define my concept or idea of triangle, but if I attempt to explain and render definite my picture of triangle, I find myself confronted with triangles of all sorts and descriptions, dancing about before the eyes of my imagination, some right-angled, some obtuse angled, some acute-angled, some equilateral, some isosceles, some scalene. The picture is all and yet none of these, utterly dim and uncertain, and existing only in virtue of its dimness and uncertainty. The larger the class of objects which this picture painted on the imagination has to represent, the fainter and more indistinct does it become, until at length it fades away into space altogether. Thus I can form a common general outline picture of *man* which, sketchy as it is, has a sort of reality. But my picture of *animal*, which is to represent at once men and brutes, can scarcely be called a picture at all, while for *living thing*, which is to combine together the members of the animal and vegetable creation in a common picture, I cannot produce any respectable phantasm at all.

4. The *concept* is not interfered with by minute-

ness of detail. I can form as distinct and accurate an intellectual concept of an eicosahedron or dodecahedron as I can of a triangle or quadrilateral figure. I can argue with no greater difficulty about the number of degrees in the angles of the more complicated figures or about any other of their distinguishing characteristics, than I can about the number of degrees in the angles of an equilateral triangle or a square. But the *phantasm* becomes gradually more difficult as it becomes more complicated, until at last it becomes a thing impossible. I cannot imagine a dodecahedron with any sort of exactness. I can picture it only in the vaguest way. I cannot distinguish at all in my imagination between an eicosahedron (or figure of twenty sides) and an eicosimiahedron (or whatever the name for a figure of twenty-one sides may be). When I attempt to imagine a figure with a much larger number of sides, say a muriahedron, or figure of ten thousand sides, I cannot for the life of me see any difference between it and a circle, unless indeed I have seen it drawn on an enormous scale.[1]

5. The *concept* is peculiar to man. No brutes can form any ideas in the true meaning of the word; they cannot rise above the world of sensation; they have no appreciation of the spiritual and the immaterial, and no faculties which can enable them to apprehend them. If they possessed any such faculties, they would in some way or other

[1] It may be well to remind the reader that the "symbolic conceptions" of Mr. Herbert Spencer are, in spite of their name, nothing else than pictures on the imagination.

manifest them, whereas they show no trace whatever of any knowledge beyond a knowledge of phenomena and of material things. They cannot grasp anything beyond individual objects. They have no power whatever of perceiving the universal under the particular. They cannot idealize, they cannot attain to any knowledge of the universal.

The *phantasm*, on the other hand, is common to men and brutes. A dog can form a very vivid mental picture of some individual, with whom it is familiar. When, during my sister's absence from home, I said to her little toy terrier Madge, "Where is Alice?" Madge would prick up her ears, look in my face, search the drawing-room, and finally run upstairs to my sister's room in anxious quest. When, by a lengthened series of protracted sniffs beneath the door, she had discovered that her mistress was not there, she would come back to the drawing-room and lie down on the scrap of carpet provided for her with a half petulant air, as much as to say: "Why do you recall to me the image of one who you know perfectly well is not at home?" Every one who is familiar with the ways of dogs has noticed how during sleep all sorts of phantasms seem to pass through their minds, often evolving outward expressions of surprise or joy or fear.

But animals have also certain phantasms which, individual though they always are, we may call by reason of their indefiniteness *common phantasms*. A dog is able to form a sort of mental picture, not only of this or that rat, but of *rat* in general.

The very word rat will often throw a little terrier into a perfect fever of excitement by reason of the picture it summons up of many a rat happily pursued to the death; the smell of a fox at once recalls to the hounds, not this or that fox, but fox in general, and there is present in their imagination a vague phantasm representing a sort of general result of all their experiences of individual foxes.

These *common phantasms* arise in the mind of animals from the combined result of a successive number of impressions made upon the imagination through the organs of external sense. A terrier has had experience at various times of a number of different rats. There is a particular shape, more or less definite, which is common to all rats—a particular mode of motion, a particular colour, a particular scent, a particular sort of squeak, a particular noise caused by the gnawing of wood with their busy teeth. It is true that all of these slightly vary with each individual rat. There are no two rats in existence of exactly the same size, or colour, or shape, or who squeak in exactly the same note, or who make exactly the same noise when they gnaw wood. But these variations are very slight compared with the family likeness existing between them all, often too slight to be perceived even by the keen senses of the most acutely perceptive animal. Hence the little terrier has what we may call a general impression of each of these particulars, just as we have a general impression of the shape common to all swans, or the song common to all nightingales, or the scent common to all roses, or the colour

common to all ripe strawberries. A number of these general impressions remain imprinted on his inner sense, and thence arises in his imaginative memory a picture ready to be evoked, in accordance with the law of association, by any of them; vague, indeed, and not precise in particular points, but nevertheless definite enough to suggest the eager pursuit of his congenital foe. If he does not distinguish between one rat and another, but has a common picture which, individual though it is, will, on account of a certain vagueness of detail, directly suit any of them, he does but follow the example of man, when not directly exercising his intellectual faculties, but those that he possesses in common with all other animals.

Thus I go into the cellar and surprise a big rat, which scuttles off at my approach. The next day I repeat my visit, and there is a big rat once more. My first impression is to identify the big rat of yesterday and the big rat of to-day. The phantasm I formed yesterday and which still lingers in my imagination is equally applicable to his fellow of to-day, if fellow it be and not the same individual. I can perceive no difference whatever between the two. A week afterwards I go again into the cellar and there is the rat again. It may be the same, it may be another—at all events he is the same to me. Just so in the mind of the terrier, a picture arises which, though still an individual picture, is, by reason of its vagueness, equally applicable to all rats, and enables him to overlook the minute and accidental difference between one rat and another

in face of the more striking features which make upon his senses a similar impression.

These *common phantasms* may be compared to the pictures of scenery familiar to every lover of art, which, individual pictures though they are, are nevertheless by reason of their generality equally suitable to a dozen different localities. "Sunset on the Coast" may be equally suggestive of the coast of France, or North America, or Norway, or New Zealand, or China, or the Leeward Islands. "Mountain Stream in Early Summer" may recall some well-known scene alike to the dwellers in the Alps or the Pyrenees, in the Rocky Mountains, or in Wales, or amid the Himalayas. The want of preciseness of detail in the scene represented on the one hand and in our memories on the other, gives to the individual picture a power of adaptation something like that possessed by the individual phantasm.

It is by such an apparent generality that the whole of modern philosophy outside the Catholic Church has been misled into the fatal error of mistaking the gross, material, individual phantasm present in the imagination for the intellectual, spiritual, universal concept present in the intellect. There are, it is true, many excuses for the mistake, and those who have never learnt to appreciate the essential distinction between the material and the immaterial, between imagination and intellect, can hardly be expected to avoid it.

## CHAPTER VII.

### SIMPLE APPREHENSION (*conti ued*). MODERN ERRORS RESPECTING IT.

Recapitulation—Modern Errors respecting Simple Apprehension—Sir W. Hamilton's, or Conceptualist account of it—Sceptical consequences of his doctrine—The Confusion involved in it—J. S. Mill's, or Nominalist theory—More consistent in itself—Leads directly to Scepticism—Nominalism and Conceptualism compared—Errors common to both—Aristotle's account of Similarity ignored by them—The Common Phantasm again—False doctrine on Conception—The source of the aberrations of Modern Philosophy.

In our last chapter we enumerated the three operations of Thought, *Simple Apprehension, Judgment,* and *Reasoning*—and divided Pure or Formal Logic into three parts corresponding to these three operations of Thought.

To the first and simplest of all operations of Thought we gave the name of *Simple Apprehension.* We explained the various processes that lead up to it, Sensible Perception, Consciousness, Attention, Sensible Memory, Imagination, which we may call mental processes (if we use the word mental in the wide sense in which it can be applied to the higher faculties of animals), but which are not processes of our intellectual faculty. These precede and subserve, but are not a part of, *Thought,* in the strict and proper sense of the word.

Beyond these subsidiary processes we traced a further process which conducts us from the sensible to that which is above sense, from the material to the immaterial, and which calls into exercise those higher faculties which are peculiar to man. This process we called *Abstraction*, and we explained how it is really identical with Simple Apprehension, inasmuch as, when we *apprehend* the object, we *abstract* the common nature which underlies the individual attributes. We also found it necessary to be on our guard against the fatal error of confusing together the *sensible image* and the *intellectual idea*, the *phantasm* and the *concept*. We drew out four points of contrast existing between the two.

1. The *phantasm* is *individual*, and only becomes a *common* phantasm by stripping off from it some of its distinguishing characteristics: the *idea* is of its own nature *universal*.

2. The *phantasm* dwells in the *imagination* and cannot pass beyond it: the *idea* dwells in the higher region of the *intellect*.

3. The *phantasm* is something vague and obscure and indistinct, the *idea* is precise and clear and sharply defined.

4. The *phantasm* is estimated by our power of representing it. We cannot represent in fancy a figure of three hundred sides. The *idea* has no limits. A figure of three hundred sides presents no more difficulties than a figure of three sides.

5. The *phantasm* is *common* to brutes and men, the *idea* is confined to rational beings.

We now pass to the uncongenial but necessary task of dealing with the aberration of modern philosophers on this vital question, the importance of which it is scarcely possible to overrate. This error, however, is, I believe, universal in the Philosophy of the Reformation.

I ask my readers to keep continually before their minds the essential difference between the common phantasm of the imagination and the abstract idea abiding in the intellect. This is the talisman to keep the Catholic Philosopher unharmed by the modern foe. It is the very touchstone of a philosophical system. If the root is corrupt, the tree will be unsound and the branches rotten. If a text-book of Logic at its outset neglects this all-important distinction, we shall find that it is infected with a disease which will taint it from beginning to end and render it unsound in almost every chapter.

We will take as our two representatives of the modern teaching on *Conception* and *Concepts* two men who in most respects stand widely apart—Sir W. Hamilton and John Stuart Mill. The former states the doctrine generally held outside the Catholic Church with great clearness and at considerable length. We will give for brevity's sake only an abstract of his exposition of it, and will refer our readers to the original if they desire to obtain more detailed knowledge of it.

When a number of objects (he tells us) are presented to our sight our first perception of them is something confused and imperfect. But as we dwell more carefully upon them and compare their qualities

together one with the other, we find that in them there are some qualities that produce *similar* and others *dissimilar* impressions. By the faculty of *attention* we fix our minds on the former of these, and by *abstraction* we turn away our thoughts from the latter. When we come to examine these *similar* impressions we find ourselves compelled to regard them as not only *similar* but actually the *same*. To use the words of Sir W. Hamilton, there are certain qualities in the objects that "determine in us *cognitive* energies which we are unable to distinguish and which we therefore consider as the same." Having observed in succession a number of these similar qualities, and one after another identified them with each other on account of the indistinguishable character of the impressions they make upon us, we at length sum them up, bind them together into a whole, grasp them in a unity of thought, unite the simple attributes into the complex *notion* or *concept*, and inasmuch as each and all of the several qualities or attributes belongs to each and all of the objects in which it has been observed, it follows that this common notion or concept which sums them up is the common notion or concept formed in our mind as belonging to each and all of these same objects. It is a *notion*, inasmuch as it points to our minds, taking note of or remarking the resembling qualities of the objects: it is a *concept* inasmuch as it is a synthesis or grasping together (*con capere*) of the qualities.[1]

[1] Cf. Sir W. Hamilton, *Lectures on Logic*, iii. 131, whose words we quote almost verbatim.

We shall, however, make this process more intelligible by a concrete example. I am standing in a room in the Zoological Gardens, before a cage containing a number of objects large and small, well-looking and hideous, blue and grey and brown and black. As I watch one of them, I observe in it movements which indicate life, and I mentally apply to it the attribute *living*. In a second I observe similar movements indicating the possession of a similar endowment, and in a third and fourth in like manner. Though the life of the first is not identical with that of the second, nor that of the second with that of the third, yet the effects as observed by us are indistinguishable, and we feel ourselves compelled to regard all these objects as sharing in a common quality of life, and consequently to each of them I give the common name of *living*. As I continue to watch them, one of them seizes his neighbour by the tail and elicits a cry of pain: this cry of pain indicates the possession of what we call *sensibility* or feeling. A second receives from a visitor some highly esteemed delicacy and gives vent to a cry of joy, and this sign of pleasure we attribute to a similar gift of *sensibility*. A third and a fourth show corresponding signs of pleasure or pain as the case may be, and though we cannot say that the feeling of the one is the feeling of the others, yet we cannot help identifying in all of them the common quality of sensibility, and of each we say that it is sensitive or possessed of feeling. As my examination of the objects before me proceeds I find in each of them other qualities, which I call *hairy*, *quadrumanous*, *imitative*, &c.; each of the

females suckles its young, each of them has a certain shape of body to which I give the name of *apelike* or *pithecoïd*, until at length, my detailed observation over, I sum up its results in one complex notion, which comprises in itself all the qualities I have observed. I bind together into the common concept *monkey* the various attributes, *living*, *sensitive*, *quadrumanous*, *imitative*, *hairy*, *mammal*, &c. I *apprehend* these various objects as *monkeys* and bestow on them the common name in recognition of their common characteristics.

Such is the process of Simple Apprehension or conception according to a large class of modern writers. I do not think that any one can say that I have misrepresented their account of it. At first sight it seems plausible enough. But the reader who has borne in mind the distinction between the sensible and material phantasm existing in the imagination and the abstract and immaterial idea existing in the intellect, will perceive how this theory labours under the fatal defect of confusing them together, or rather of ignoring the universal idea in favour of the common phantasm. It tells us to strip off from a number of individual phantasms that which is peculiar to them as individuals, and to retain only that which is similar in all of them. But when the process is complete and these *similar* qualities have, by the transforming power of the human mind, been regarded as *identical* with each other, as not only similar but the same,—when, moreover, these identical qualities have been gathered together into a "unity of thought," into a concept comprising them

all, into a composite whole of which they are the components parts, this whole has its home in the imagination just as much as the various attributes originally observed in the individuals. The only difference between the individual objects and the common concept is that the latter has lost the distinctive characteristics of the individuals and by reason of this dimness and indistinctness is capable of being fitted on to all of them. It is not an independent object of thought, it is essentially relative and imperfect; it is not the essence of the various individuals, that inner something which is the substratum of their qualities. We cannot even *think* it, until we supplement it with the various qualities which characterize it to us as an individual thing. We cannot think of *monkey as such*, we must refer our concept to some individual monkeys of which we form a picture in our mind. Hence the modern theory of the Relativity of all Human Knowledge.[1]

Hence, too, the philosophical scepticism to which it necessarily leads if carried out to its ultimate conclusions. If all knowledge is relative, absolute truth disappears from the face of the earth. What

[1] "But the moment we attempt to represent to ourselves any of these concepts, any of these abstract generalities, as absolute objects, by themselves, and out of relation to any concrete or individual realities, their relative nature at once reappears; for we find it altogether impossible to represent any of the qualities expressed by a concept, except as attached to some individual and determinate object; and their whole generality consists in this,—that though we must realize them in thought under some singular of the class, we may do it under any. Thus, for example, we cannot actually represent the bundle of attributes contained in the concept *man*, as an absolute object, by itself, and apart from all that reduces it from

is true to one man is not true to another. The identity of nature which we attribute to the various individuals comprised under the common concept and called by a common name is a pleasant fiction of the human mind, and has no corresponding likeness of nature in the individuals as they exist in reality. There is nothing but a certain *apparent* likeness which we consider as *real* because we cannot distinguish between the effects produced upon our cognitive energies by these apparently similar qualities.[1] *Thought* is no longer the exclusive property of the intellect, but is a sensible faculty, picturing to itself the products of the imagination as well. It is true that a certain distinction is drawn between *Thought* or *Cognition* on the one hand and *Representation* or *Imagination* on the other:

a general cognition to an individual representation. We cannot figure in imagination any object adequate to the general notion or term *man;* for the man to be here imagined must be neither tall nor short, neither fat nor lean, neither black nor white, neither man nor woman, neither young nor old, but all and yet none of these at once. The relativity of our concepts is thus shown in the contradiction and absurdity of the opposite hypothesis." (Sir W. Hamilton's *Lectures on Logic*, i. pp. 128, 129.)

[1] The slovenly and inaccurate use of the word *Thought* is one of the most fruitful sources of fundamental error in modern philosophy. We have noticed at the beginning of this volume the double sense it bears. Sometimes it is limited to intellectual knowledge, sometimes it is extended to every exercise of the inner faculties, sensible memory, imagination, attention, as well as to the acts peculiar to a rational nature, and this without the two meanings being distinguished from each other. Hence the mischievous confusion between the nature of the lower brutes and of mankind. If a dog is capable of *thought*, in the strict sense of the term, he is also capable of *reasoning*, and has an intellect differing only in degree from that of man.

but this distinction is an utterly inadequate one. It is explained as consisting in the *manner* of cognition, in the way in which the objects are known. The contrast between the *immaterial* faculty with which we *think*, and the *material* faculty with which we *picture* or *imagine*, is entirely ignored. The contrasts between the objects of *thought*, which are essentially abstract and universal, and the objects of *imagination*, which are concrete and singular, is in no way recognized. *Thought* is made out to be a process of the same faculty as *imagination*, and to be concerned with exactly the same objects that we have already pictured in our imagination, only in a different sort of way. Thus the gulf which separates the material from the immaterial is entirely ignored, and the fundamental confusion, which is the necessary result, extends itself to every part of the systems which, outside the Church, have succeeded to the clear and consistent teaching of scholastic philosophy.

But as yet we have been considering only one of the leading schools of English philosophy at the present day, the one which, strange to say, represents the more orthodox section of modern philosophers, and this in spite of the utter scepticism which is virtually contained in the fundamental doctrine from which it starts. The weak points which it presents are attacked, with great vigour and success, by what we may call the rival school of John Stuart Mill. We are not concerned with the dispute, but simply with the counter-theory, which we may call that of the modern school of Nominalists, according

to which the process of Simple Apprehension, or rather of the formation of complex ideas, takes place as follows:

When any object is presented to us, we have the power of fixing our minds on some of its attributes and neglecting the rest. To each of these selected attributes we give a name for convenience sake: and when we have observed a certain number, we give to the collection a name which combines them all, and is regarded as the name of the object in which they are found united. Subsequently another object presents itself before us with another set of attributes. Somehow or other this second set of attributes recalls those observed in the former object, and though there is really nothing common either to the objects or to their attributes, we give them for convenience sake the same name that we bestowed on those previously observed, on account of a certain likeness between the one set and the other. Each of these new attributes receives the name bestowed on one of those belonging to the former set, and so the second collection receives the name given already to the former collection. Between the two objects there is a likeness by reason of the likeness between the attributes they severally comprise, and this justifies their common name. The same process is repeated in the case of other objects observed, until at length we have a number of individual attributes existing in a number of individual objects, bearing the same name for convenience sake, and because they produce similar impressions, but nevertheless having nothing whatever

in common except the *name*. Similarly the individual objects are called by the same name only as a species of abridged notation necessary to the working of the human mind, but not because they have really a common nature.

Thus I suppose myself as before in the same house in the Zoological Gardens. I fix my mind on a certain group of attributes in one of the objects before me and banish all the rest. *Living*, *sensitive*, *mammal*, *quadrumanous*, *hirsute*, *imitative*, *pithecoïd*, &c., are the attributes which absorb my attention. These I stereotype under the name *monkey*. I am thus enabled to argue about them, just as if there existed a corresponding entity which had these attributes only, and was endowed with none of the accidental characteristics of individual monkeys. In another of the objects before me I observe another group of attributes which makes upon me a similar impression to those already enumerated, and I say to myself, This, too, is a monkey. In a third and fourth case the same process is repeated, and thus I form a class of monkeys, including under it all those objects which possess the attributes aforesaid. There is nothing really common to the individuals that form the class save only the *name*, and the upholders of this theory point out with good reason the inconsistency of the Conceptualist doctrine which makes concepts play so prominent a part in the whole of Logic, though all the time its upholders confess that a concept is always something *relative* and has no existence apart from the concrete image of which it forms a part.

The Nominalist theory is, it must be confessed, more consistent than that of Conceptualism, but at the same time it is more directly and immediately sceptical, and involves under its specious exterior the same distinctive fallacy as its rival. It is important that we should have this fallacy very clearly before us, lying as it does at the root of the whole system and vitiating it from first to last. Mill and Bain and the Nominalist school generally tell us that we are to select a group of attributes from an individual and to bind them together by means of a common name. But what is to guide us in our selection of the Attributes? Their answer is that we are to choose those which are *similar* in a number of individuals, and which therefore make upon us the same impression. But what is the origin of this similitude? Why is it that we cannot help recognizing in a number of objects what we call common properties? I imagine that all would admit that it has at least some foundation in the objects themselves. If the impressions on our senses, which we are compelled to regard as similar, represent no corresponding qualities in the objects, if the identity which we recognize is something purely subjective, a mere delusion by which we deceive ourselves, without any counterpart in the objects, then our senses can be in no way trustworthy, and we soon arrive at a self-contradictory scepticism. Both Nominalist and Conceptualist desire to avoid this conclusion from their premisses, and therefore concede a certain likeness between one and another of the objects around us which is

the cause of the impressions they make appearing to us to be the same.

But in what does this likeness consist? To a scholastic Logician the answer is simple enough. The objects, he tells us, are alike inasmuch as they share the same nature and are made after the same ideal or pattern. There is the same *form* in all of them. The common name of *monkey* is given to a number of individuals because they have one and all the common *form* or *nature* of monkey. The common *idea* (or *concept*) of monkey is not picked up from the mere observation of a number of the class of monkeys. It represents something which has a real and true counterpart outside the human mind, an intellectual entity which is not simply dependent on the individuals. This entity stamps its stamp, so to speak, on all the individuals, and the human mind by a sort of rational instinct, recognizes at once the common mark or type wherever it exists. The intellect claims it as its own, transfers it into itself, abstracts it from the individuals, not by shaking off some of their attributes and leaving others, but by the power it possesses to extract the immaterial form from the material object in which it is realized.

This external entity the Conceptualists deny. They tell us that what we call a common idea or concept has no reality apart from the human mind, that it is the mind that creates it, and that it has no sort of existence outside the creative mind of man. The Nominalist goes still further, and says that there is no such thing as a concept at all, but that the bundle

of attributes common to a number of individuals which the so-called concept is supposed to represent, are but the selected attributes of a single individual, on which we choose to fix our attention to the exclusion of all other attributes. The attributes which form the bundle are in their first origin, and always remain, individual attributes. The fact that others similar are often found in other individuals does not alter their character. All, therefore, that is common about them and the concept into which they are combined is its *name*, which is applicable to all the individuals to which we apply it as well as to its original possessor.

Thus the Nominalist abolishes the very notion of anything like universality in the concept or idea that is the result of the process of Simple Apprehension. All that is universal is the name. Here it is that he breaks with the Conceptualist. The latter at least keeps up the theory of an universal concept applicable to a number of individuals, even though the mere fact of its being relative to each of them destroys any claim on its part to true Universality: he still asserts the existence of *ens unum in multis*, one and the same thing found in a number of individuals, even though its unity is purely a factitious one, brought about by the action of the faculty of Generalization, which enables us to regard the sensibility of one ape as one and the same with the sensibility of another, without there being any real objective sameness on which this mental identification of them is based. The Nominalist, more consistent and thorough-going

does not attempt to keep up the sham of the Universal. Your concepts, he says to the Conceptualist (and he says so very rightly), are but the shadow of a shade, a convenient stalking-horse of which, however, a closer examination shows the utter unreality. Why not throw over the delusion and frankly confess that universal names are but a sort of abridged notation convenient for practical purposes and as a means of classification, but having really nothing corresponding to them in the objects for which they stand?

But Nominalists and Conceptualists alike leave one question unsolved. What is it that guides us in the process of Classification? What is it that enables us to regard as the *same* the different attributes found in different individuals and to give them a common name? I imagine that the answer of both Nominalist and Conceptualist would be that these attributes, though different, nevertheless so resemble one another that they produce on our senses indistinguishable impressions. But if we pursue the question and ask whether similarity is possible without identity, whether any two objects belonging to the same order of things can be *alike* without having something in *common*, whether language does not cease to have a meaning if resemblance does not imply a certain unity of nature, Nominalist and Conceptualist alike find it hard to make any satisfactory answer.

We shall see as we proceed what the true doctrine of Universals is. We are at present concerned with

it only in so far as it affects the doctrine of Simple Apprehension. We are considering what is the underlying fallacy which vitiates the theory of Conception or Simple Apprehension as put forward by Post-Reformation philosophers, and leads them to the abyss of scepticism into which they are forced by the inexorable power of a pitiless Logic.

Their weak point, then, does not consist merely in their confusion between the *phantasm* of the imagination and the *idea* of the intellect. This is rather the result than the cause of their errors. Their radical and fundamental mistake consists in the supposition that it is possible for two objects to resemble one another without having some *fundamentum in re*, something truly and really common to both of them, in which this resemblance has its origin.[1]

This error is very closely connected with other errors that we have enumerated above as introduced into the modern doctrine of Simple Apprehension. It is because Hamilton and Mill alike fail to recognize identity of quality as the basis of resemblance that they fall into the blunder of confusing together the material phantasm and the immaterial idea. If Hamilton and his followers had clearly

[1] Aristotle defines *similarity* as unity in some *quality*, and distinguishes it from *identity*, which consists in unity of *essence* ταὐτὰ μὲν γὰρ ὧν μία ἡ οὐσία, ὅμοια δὲ ὧν ἡ ποιότης μία. (Arist. *Metaphysics*, IV. 15, 1.) Hence two things that are alike must have some one quality which is *one and the same* in both. It is not enough that they should have *similar* quality or qualities, and that the mind should have the power of regarding the *similarity* as *identity*.

perceived that in each and all of the individual objects which are classed together there must be, in virtue of their mutual resemblance, some one or more common qualities existing in each and all, and the same in each and all, they would have seen how the common phantasm, arrived at by stripping the individual of its individual peculiarities, could never furnish qualities common to the various individual members of the class. In the same way if Mill and his disciples had borne in mind that the group of attributes on which they fix their attention in the individual are, from first to last, *individual* attributes inapplicable to other individuals, and incapable, without some further process, of a name which is really common, they would not have fallen into the error of attempting to classify without any real basis of classification.

The *common phantasm*, we once more repeat, is not really common at all. It is simply an individual phantasm rendered so vague and indistinct by the separation from it of its distinguishing characteristics that it will stand just as well, or rather just as badly, for one individual as another. It is like a man we see at a distance; we cannot see whether he is tall or short, fair or dark, thin or stout, handsome or ugly, young or old; he will do for anybody—Brown, Jones, or Robinson, simply because he is like the common phantasm, stripped of the individual marks that divide him off from other men. But he is an individual none the less, and no amount of generalization will make him really a type common to Brown, Jones, Robin-

son alike. It is only because of the vagueness of his outline and the uncertainty of his form that our imperfect faculties can see in him one or the other, and we know all the while that when he approaches nearer we shall recognize his individuality. There is no sort of universality about him, or nothing but that counterfeit universality which consists in the vague indistinctness of imperfect perception. Modern philosophers and philosophizers would never have mistaken two things so different from each other if they had mastered the principles, we do not say of Scholastic, but of Aristotelian Logic. Nothing but ignorance of the very elements of the doctrine of the Stagirite could have led them into so fundamental an error.

Just as in theology the central point of the Reformation of the sixteenth century consisted in the rejection of Papal Supremacy, so in Philosophy the new order of things and the Philosophy of the Reformation had their *point d'appui* in the modern theory of the *Concept* and of *Conception*. It is not really new: like all modern errors, it dates from Pre-Reformation days, and is but an old fallacy refurbished and dressed up in new terms. But it never took root in Europe until it found a home under a congenial religious system, under which it grew and flourished, and to which it afforded the most material assistance. Without this new theory the confusion between intellect and imagination, which serves Protestantism in such good stead in its resistance to dogma, would never

have gained a permanent footing. Without this the philosophical scepticism, which is the offspring of the Reformation, would have been checked at its outset. It is this theory which, once adopted, is fatal to the consistent acceptance of the Catholic doctrine of the Blessed Eucharist, it is this which, in its ultimate consequences, renders belief in God impossible. It is an universal solvent: little by little all rational belief, all religious dogma, becomes, under its influence, faint and feeble, and at last altogether disappears. All truth becomes subjective to the individual, all knowledge becomes relative. If men who number it among their philosophical opinions still retain some positive belief, it is only because the human mind so rarely follows out an opinion to its final results, or because in contradiction to all reason it holds opinions which are irreconcileable with each other. This last alternative we see realized in a most remarkable way in the cynical philosophy of our modern "thinkers." The antinomies of Kant, the contradictory propositions which Hegel admits as simultaneously true, the despairing agnosticism of Herbert Spencer, the open infidelity of the Materialistic school, are all based on one or other of the different phases of the modern philosophical heresy respecting the Concept and Conception.

# CHAPTER VIII.

## THE DOCTRINE OF UNIVERSALS.

Re-statement of different doctrines of Conception—What is meant by Universals—Various kinds of Unity—Errors of Modern Conceptualism — Nominalist attack on it — Nominalism—Results of Nominalism — Unity and Universality — The Scholastic Doctrine — Sir W. Hamilton's objection to it—Direct and Reflex Cognition—The one and the many—What is Essence?—Two kinds of Universals — Ultra-Realism — Its two Phases—Summary of the true Doctrine of Universals.

WE must now return from the digression of our last chapter, in which we stated the modern doctrine of Conception and Simple Apprehension and pointed out its fundamental errors. But we must first sum up the results at which we arrived.

Simple Apprehension is described by Sir W. Hamilton as the grasping into one of a number of Attributes observed in various individuals, the result being the common concept, or bundle of qualities, which have made upon our minds indistinguishable impressions, and which we therefore regard as the same.

Simple Apprehension, says Mill, is the exclusive attention to one isolated group of attributes in an object, apart from the rest, the attributes thus isolated being those which are similar in a number

of individuals, to which we consequently give a common name and describe as belonging to the same class.

Each of these theories ignores the foundation of all resemblance which consists in the possession of some quality, or set of qualities, which is the *same* in all the individuals in which it is found, and consequently of a real underlying similarity of nature existing in the nature of things, and not a mere mental fiction. It is this error which is the chief source of all the confusion in modern philosophy: of its inability to distinguish between the phantasm and the concept, between the material and immaterial faculties, between mental processes of men and animals. From this same error proceeds its ever increasing scepticism, its elimination of all absolute truth alike from Religion and Philosophy. The rotten foundation renders each portion of the edifice unsafe, and must necessarily end in gradual decay and final destruction.

Our Catholic theory of Simple Apprehension or Conception, on the other hand, is that it is the grasping by the intellect of that supra-sensible entity which underlies the sensible and material qualities of the things of sense. It is the apprehension of that which makes the thing to be what it is. The intellect pierces through the veil of sense to something which lies beneath and beyond it, and which is altogether beyond the reach of the imagination, or any other material faculty. It attains the true nature of the object which constitutes its essence, a nature which it shares with all other objects

belonging to the same class and called by the same name: a nature which is perfectly alike in all, and, as conceived by us, is not only alike in all, but the same in all; a nature which is the source of the common qualities of the objects, causing them to resemble one another and to make upon us similar impressions: a nature to which we never could attain by the stripping off of some of the qualities of a number of objects, or by any exclusive fixing of the attention on one group of attributes to the exclusion of the rest: a nature which can be reached by the intellect, and by the intellect alone, in virtue of its immaterial and supra-sensible character.

But we now arrive at another of the most widely discussed and disputed questions of Philosophy. What are we to say respecting this common nature found in many individuals? How can it be really one and the same in all? It seems a contradiction to say that a quality present in A is identical with a quality present in B. There may be a certain similarity between them, but are they not marked off from each other by the fact that they belong to different individuals? If an apple-tree is to be found in my neighbour's garden it cannot be the same tree which is at the same time found in mine. If the attribute of *mischievous* exists in one monkey, the same attribute cannot also exist in another by its side. So said the Nominalists and Conceptualists: not only the modern teachers of error to whom we have given these distinctive names, but their representatives in mediæval days. We have now to

investigate a very important question, viz: What is the true doctrine of Universals?

In order to understand where lies the fallacy into which all have fallen save those who have followed in the steps of Aristotle and St. Thomas, we have to try and gain a clear notion of what is meant by *unity*.[1]

Unity is of two kinds, the unity of the Individual and the unity of the Universal.

1. The unity of the Individual is a numerical unity; we can count the individuals, one, two, three. The unity of the Universal is a unity of nature. The unity of the Individual enables us to point to some object and say this is *one* and no more. It is *ens unum, non multa.*

2. The unity of the Universal enables us to point to a number of objects and say, "All these objects have some common quality, one and the same in all. It is *ens unum in multis.*"

3. The unity of the Individual is a unity obvious to sense and the sensitive faculties: it is the only sort of unity that sense can appreciate: the unity of the Universal is a unity above and beyond the capacity of sense, one which it is possible only for intellectual natures to grasp.

4. The unity of the Individual separates off that in which it exists from all around. The unity of the Universal binds together into one all those

[1] Aristotle, *Met.* iv. 6, distinguishes four kinds of unity: Continuity, totality, individuality, and universality—*τὸ συνεχὲς, τὸ ὅλον, τὸ καθ' ἕκαστον, τὸ καθόλου.* The first two kinds of unity may be passed over as irrelevant to our purpose.

objects in which it is found, even though in all other respects they may be separated from each other.

5. The unity of the Individual is that which the mind first perceives in the order of time. The unity of the Universal is that which comes first in the order of nature, inasmuch as no individual things could exist unless unity at least of *Being* is previously supposed.

6. The unity of the Individual is but a secondary and inferior unity. The unity of the Universal is the primary and original unity.

7. The unity of the Individual is one of which we can paint a picture, so to speak. Our imagination can represent to itself one man, monkey, &c. The unity of the Universal cannot be represented to our imagination. We cannot put before ourselves a picture of man in general, or of monkey in general.

But is the unity of the Universal a true unity? Here it is that Nominalists and Conceptualists and all the moderns fall away from the truth. They do not recognize the true unity which is found in various individuals who belong to the same class. They do not recognize that there is a true unity in that which we call by the name of *humanity*, and which constitutes the nature of man; that it is, as represented in the human mind, one and the same thing, whether found in John, Thomas, or Harry; in Jane, Mary, or Susan; in white or black; in civilized or savage; in the baby recently ushered into the world and the patriarch of ninety summers; in good men or bad; in antediluvian mortals and

those existing in the present day. Under its intellectual aspect it is one and the same everywhere, one and the same from all time, one and the same to all eternity.

Here is the first principle that we must grasp in order to understand the doctrine of Universals. We must hold fast to the unity or oneness of Nature as a true real unity, nay, a truer unity than the oneness of the Individual, a more permanent unity, a unity derived from a higher source, a unity which flows from the Divine Nature into the things God has made.

Now what do the Conceptualists say about this unity of Nature? We have already seen that their doctrine is that we observe in a number of objects certain qualities in which they *resemble* each other, and these similar qualities we consider as *the same*, not because they correspond to a nature perfectly alike in all the individuals, but because they determine in us cognitive energies which we are unable to distinguish. Observe, the qualities are *similar*, but not the *same*. It is our minds which identify them because they make on us impressions which we cannot distinguish, not because our intellect has the power to discern the nature common to all of them. Their oneness is the *creation* of our faculties, not the necessary aspect under which our faculties regard the perfect objective likeness which exists in all the individuals; we do not, according to the Conceptualists, recognize the oneness already existing, but simply manufacture it for ourselves. It is something factitious or fictitious. There is no

true unity in existing things, and therefore no universality based upon this unity.[1]

The Conceptualists differ from the Nominalists in this, that the former, after noting the similarity in the qualities observed, give to each of them and to the concept they compose a factitious unity. One and the same concept is assigned to all. After they have noticed the mischievousness of the monkey, his apelike-form, his quadrumanity, his mammality, and noticed similar qualities in another, and in a third, the Conceptualists say: "Why should we not consider each of these qualities as identical in all these different creatures? It will be very convenient. Of course it is not true, but for practical purposes we will regard them as the same, and we will regard, moreover, the nature which they constitute as the same in all. We will regard the mischievousness of the first of these little animals as identical with the mischievousness of the second and the third, and so on all their other qualities, and we will, moreover (for the same convenience sake, and because we cannot see any difference of nature, however great it may really be), think of them all by the common concept *monkey*. We will identify them all in thought."

[1] Sir W. Hamilton, *Lectures on Logic*, III. 125. In his *Lectures on Metaphysics*, II. 315, he sums up the Conceptualist doctrine: "Generalization is notoriously a mere act of Comparison. We compare objects; we find them similar in certain respects, that is, in certain respects they affect us in the same manner, we consider the qualities in them, that thus affect us in the same manner, as the same; and to this common quality we give a name; and as we can predicate this name of all and each of the resembling effects it constitutes them into a class."

"Not so," reply the Nominalists. "You have no sort of right to regard these concepts as *Universals.* As they are mental creations they are nothing but what they are thought as being, and as they are always thought or regarded by the mind as part of an *Individual* object, they cannot be thought a *Universal.* They can only be realized in thought as enveloped in the miscellaneous attributes of the *Individual,* and therefore *Individual* they must always remain."

This is a just criticism. Conceptualism is but Nominalism with an inconsistent attempt to be rid of the scepticism it involves.

But what is the theory the Nominalists hold? All is *Individual,* they say, save only the *name.* Every concept or attribute is different from every other concept or attribute. In nature there is no unity—only a certain similarity of nature which justifies us in giving a common name to the various qualities and groups of qualities observed. We fix our attention on a certain group in a certain individual and sum up this group in the name *monkey,* then we pass on to a second individual and we are attracted by certain qualities which by some law of association recall the qualities of the former, and for convenience sake we give the same name to the various individuals which recall others which we have observed before. And whenever we come across a quality or set of qualities which recalls the group first observed, the name, too, comes to our thoughts and is a very useful shorthand expression for all of them alike. When I observe certain actions which work destruction for destruc-

tion's sake, I have recalled to my mind the monkey, who thrust his paw outside the cage, and having dragged within it the handkerchief held too near the bars, tore it to pieces in triumph with malicious joy. Whenever I observe similar aimless destruction, whether in man or beast, the name mischievous comes to my mind and I recur to the procedure now dim and indistinct which I first characterized by the term.

"We employ our conceptions," says Mr. Mill[1] (and he means by conceptions the group of qualities which we observed in some individual), "for the colligation and methodization of facts, but this colligation does not imply any connection between the facts except in a merely metaphysical acceptation of the term." The ideas may become connected, but this connection is simply a connection of thought, without any corresponding connection of fact. We are led to think of them together, but this consequence is no more than may be produced by any casual association. They are linked together by the common name, but there is no corresponding link in the objects themselves. Hence *Universals* are mere words. This was the doctrine of the mediæval Nominalists, who, according to St. Anselm, taught that Universals were a mere empty sound.[2]

Now, what is the consequence of this doctrine? In the first place it utterly destroys the nature of human language. Our words no longer express our

[1] *Logic*, ii. 195.

[2] "Universalia esse nonnisi flatum vocis docebant nominales." (St. Anselm, *De fide SS. Trinitatis contra blasphemias Roscellini*, c. 2.)

ideas. If *monkey* is simply an abridged notation for a group of external objects, who really have nothing in common; if when I say, *Monkeys are mischievous*, I simply mean that whenever I see certain objects of a certain shape and appearance I am thereby reminded of the performance of a certain monkey whom I once saw tearing a handkerchief to pieces, and do not connect the name with any general idea present in my mind, language ceases to have any meaning. When I speak of *honesty* I do not have present to my mind any characteristic common to all men whom I call by the name honest, but I simply allude to certain individual attributes in a certain individual man which I choose for convenience sake arbitrarily to apply to other men whom I include in the class honest. But as for honesty, mischievousness, &c., that is no such thing—abstract ideas are all nonsense. Nothing really exists except those things which our senses can perceive. The invisible world disappears altogether. All our faculties are material. The imagination is the test of truth. What we can realize with our imagination is true, what we fail thus to picture to ourselves is either false or non-existent. In fact Nominalism is the necessary companion of the sceptical philosophy of the school of "Sensationalists," and shares the contradictions and inconsistencies of those who deny to man all his higher faculties.

If the Nominalists cling to their assertion that there is a certain resemblance in the qualities of objects outside of us, a certain uniformity of nature that furnishes a basis for our classification, this is

simply to give up their whole position. This is the inconsistency of which John Stuart Mill is continually guilty. He allows that there must be an agreement between the objects classified, that they must produce upon us similar impressions of sense, that they must resemble one another, that they must have common properties. What else is all this but to admit the existence of the very objective unity that he denies? He allows that the course of nature is uniform, says this is a fact of experience. But how can I recognize this uniformity unless it is there to be recognized? Clear instance of a vicious circle! It begins by reading into things around us a certain uniformity, and ends by drawing forth out of them this same uniformity as the discovery of the intellectual powers of man.

But we must not linger over these false theories. We have not yet answered the difficulty with which we started. How can the same thing be found in two objects a thousand miles apart, except by a miracle? How can the same humanity be found in John, who is young, fair, clever, virtuous, and lives in Edinburgh, and in Sambo, who is old, ugly, stupid, vicious, and lives in the Brazils? Is it really the same identical thing which is found in each of them? No, it is not the same identical thing which exists in each and all. It may seem a paradox to say it, but it is nevertheless true that the Universal nature which the mind recognizes as the same in all the individuals, is not really and objectively *the same*, inasmuch as it is impossible that one man's rationality can be objectively identical with

another man's rationality. But it is a *perfect likeness* in the nature as it exists in the various individuals, and the human intellect contemplating this perfect likeness, regarding it under its intellectual aspect, pronounces it as conceived by us to be an identity. We know that the rationality of one man cannot be in reality identical with the rationality of another, but when by abstraction from all else we regard it in one and another, we cannot perceive any sort of difference between the rationality of the one and of the other. The perfect objective likeness between the two rationalities paves the way for their representation in the mind by one common concept.

This one common concept, in virtue of which we speak of rationality as *ens unum in multis*, as *the same* in all human beings, represents the rationality of each *inadequately* not *adequately*. It is because of this inadequacy, which necessarily accompanies our mental representatives, that we regard things *perfectly alike* as *the same*. In scholastic language, the *metaphysical* essence of all human things is the same: the *physical* essence is not the same, but perfectly alike in all: the metaphysical essence being nothing else than the physical essence as inadequately conceived by us.

What is therefore *perfectly alike* as it exists in nature, inasmuch as it is an exact though inadequate copy of the edict or pattern which all things imitate, is for us not not only *perfectly alike* but *one and the same*, because our view of things is in its turn inadequate, and we cannot help regarding as *the same* things which are necessarily conceived by us under one and the same concept.

Hence the common nature is for us the very same identical thing as it exists in each. John has the same human nature as Sambo. Humanity or human nature is *ens unum in multis*, one single thing existing in many. It is *one*, not with the unity of the Individual, but with the unity of the Universal. That which is one with *individual* unity cannot be multiplied. That which is one with *universal* unity can be multiplied, because the mere fact of its being universal implies that its unity is not an objective unity, but yet it is a unity which we cannot regard as anything else but one. It is a true unity, inasmuch as there is no diversity, except such as is implied in its existing in different individuals—but nevertheless not an unity apart from its mental representation, but rather a perfect likeness transformed into unity by the mere fact of its being the object of Human Thought.

But if the general idea of *man* is common to John and Peter, how can it be realized in *thought* as one and the same? Does it not contain contradictory attributes according as it belongs to one and the other? Yes, says Sir W. Hamilton, and therefore to call up any notion or idea corresponding to the universality of man is manifestly impossible. The doctrine therefore of a common concept of man must be rejected on account of these inherent contradictions, in spite of its claiming the authority of Locke.[1]

[1] "Locke maintains the doctrine (of Conceptualism) in its most revolting absurdity, boldly admitting that the general notion must be realized, in spite of the Principle of Contradiction 'Does it

This line of argument, pervading as it does all the Hamiltonian philosophy, shows his utter confusion between the material phantasm and the immaterial idea—between imagination and reason. Because the *imagination* cannot conceive or represent to itself the phantasm of a man who is neither white nor black, tall nor short, &c., this school of Philosophers went on to the most inconsequent assertion that therefore the *intellect* cannot *conceive* the universal idea of *man* without these accidental attributes.

This strange blunder, for we can call it nothing else, makes *imagination*, not *reason*, the test of truth. What I am able to picture to my imagination, is or may be true. What I cannot so picture is false.

But a further objection may be raised. It may be urged that the intellect cannot recognize as universal that which is found in the individual. If I examine Peter and discover in him humanity, how can I say that his humanity is something universal—*ens unum in multis*. If so, it is not Peter's humanity. If man is a Universal, do I mean when I say that Peter is a *man*, that Peter is also a *Universal?*

The difficulty is solved by the distinction between

not require,' he says, 'some pains and skill to form the general idea of a triangle? (which is yet none of the most abstract, comprehensive, and difficult); for it must be neither oblique nor rectangle, neither equilateral, equicrural, nor scalenan: but all and none of these at once. In effect, it is something imperfect, that cannot exist; an idea wherein some parts of several different and inconsistent ideas are put together" (Hamilton, *Lectures on Metaphysics*, 300, 301.)

*direct* and *reflex* cognition, between direct and reflex Universals. When an individual object is placed before the intellect, the intellect has the power of *abstracting* or *educing* from the sensible or accidental qualities its underlying nature. Peter is presented to it. By its power of abstraction the intellect draws out of him his humanity and recognizes him as a *man*. It then has a direct cognition of Peter and forms the direct concept *man*. It neglects all the accidental peculiarities of Peter, his size, colour, mental powers, nationality, age, character, &c., and regards him simply as *man*. Man is the *universal* term expressing the nature of Peter. This, in point of fact, is a Universal, but I have no right as yet to regard it as such, or to pronounce explicitly its universality. It can at present claim only a potential universality. It may be called a *direct* Universal in that it is directly known by the intellect in the single object Peter, or a *fundamental* Universal in that the foundations of an explicit universality are laid, or a *metaphysical* Universal, inasmuch as though in its own proper nature it is such, yet it is not yet acknowledged to be such by the mind that is contemplating Peter. I have not yet gone on my quest of other individuals, real or possible, in whom it is found, or may be found. At present I am satisfied with Peter. I have put aside all the qualities that individualize this nature in Peter, and look at it in itself. I perceive the Universal in the particular individual, but I do not as yet perceive it *as a Universal.*

But I now go a step further and say to myself,

This concept of humanity belongs to other individuals besides Peter. We must look at it not only as something which I have abstracted from the individual Peter, but in itself as common or communicable to a number. We must regard it in its relation to these various individuals to whom it communicates itself and who share in its nature, and who, by reason of their participation in it, acquire a unity of their own. In other words, we must look at the Universal *as a Universal*—as a *reflex* Universal inasmuch as it is attained by the mind reflecting on itself and exercising a reflex act of cognition—as a *logical* Universal, inasmuch as it is found as a Universal in thought and not in external fact.

But is the nature it expresses one or many? It must be *one;* its very essence is that it is *one* nature in many things. It must also be *many;* inasmuch as it is multiplied so as to be found in John, Thomas, Harry, Mary, Susan, &c., as well as in Peter. It is then at the same time *one* and *many*: *one* in itself, *many* in respect to the many individuals to whom it stands in relation. Now, this logical Universal is not found as such outside the mind. How can it exist as one and the same in a number of individual things without the mind coming to unite them into one by its recognition of its identity in all? It is indeed the one nature in them all; but Universality includes more than this: it includes the conception of their identity in each and all by the intellect exercising itself upon them.

We have now another Scholastic mystery to explain—a mystery, however, which, like all mys-

teries, has only to be examined to fade away incontinently. What is that mysterious something called *essence*, a word which mysteriously renders the scarcely less mysterious language of Aristotle?[1]

Let us ask ourselves what we mean by *essence?* In common language the essence of a thing is that which comprises extracted qualities united together in a small compass. *It is that which constitutes it what it is*, that which contains its special characteristics. Essence of peppermint comprises, or is supposed to comprise, the virtues possessed by the peppermint whence it is extracted. It is that which makes peppermint what it is. So the essence in philosophical language *is that which makes an object what it is*, the inner nature whence springs all its characteristic qualities. *Humanity* is the essence of men inasmuch as it contains in itself all that makes every individual member of the species really and truly human. Hence *essence* is merely another name for that which constitutes the nature of the individual taken apart from the fact of his individuality. The *direct* Universal expresses that nature so considered. It is the essence of John that he is a man, and I directly take cognizance of his universality when I think of him as a man.

But the essence of John is also the essence of Peter, Sambo, &c., and of all the individuals in whom humanity is found, and the *reflex* Universal expresses that common nature regarded as common. I *reflect*

[1] We have already explained (p. 5) the meaning of the Aristotelian expression τὸ τί ἦν εἶναι, which is the equivalent of the Latin *essentia*.

on the fact of its being common to them all, and *man* becomes a *reflex* Universal as expressing the common nature of them all. They lose their individuality, or rather put it out of sight and appear before my mind in their corporate capacity as a Universal class.

Here we start a new question: Does the Universal contain the *whole* essence of each individual or only *part* of it? Does it ever express anything which is not strictly the essence, but is yet always joined to it? We shall see that from this question arise what are called in Logic the Heads of Predicables. These we must postpone to our next chapter. In the present one we have still something further to say about Universals in order that they may be clear to our readers.

We have seen that there are two kinds of Universals, the one which we have termed *potential, fundamental, metaphysical.* The mind contemplates the nature of Peter as found in Peter in a *direct* act of cognition. The other is the *logical* Universal or Universal *regarded as a Universal.* Here the mind contemplates the nature of Peter in a *reflex* act of cognition, not merely as found in Peter, but as common to John, Thomas, Mary, Jane, &c.; in fact, to all existing members of the human race.

The mistake of the Conceptualists consists in their confusion between these two kinds of Universals. Instead of keeping them separate, they started the theory that the *mind* has the power of transforming one into the other, or rather of forming a *logical* Universal for itself out of the

*similar* qualities found in various individuals. They did not distinguish between the act of the mind contemplating the nature of Peter as human nature, and so obtaining a knowledge of Peter through the medium of the concept, and the act of the mind putting aside all thought of Peter and reflecting on the human nature found in him and in all other men alike. They seemed to think that all knowledge was *reflex* knowledge, and that we contemplate Peter's nature, not as known to us *through* the concept, but as a concept already formed by the process of stripping off from him his individual peculiarities. Hence they never rose above the picture of Peter as painted on the imagination, and their error as to Universals proves to be identical with their error respecting the nature of Simple Apprehension.

The Nominalists, on the other hand, seeing the weakness of the Conceptualist doctrine that the mind can form for itself universal concepts out of qualities not really identical, and can assert the existence of unity where there is no true unity, threw off all idea of Universals properly so-called, except universal names. They asserted everything to be individual and particular, though at the same time they quietly assumed a certain uniformity of nature which practically asserted what they denied, and which was an assumption, unconsciously introduced into their system in order to give it some semblance of consistency.

But there is a third error respecting Universals attributed by Aristotle to Plato, and found in a few ancient and middle age Logicians, as a sort of

reaction against Nominalism and Conceptualism. This was the error of the Ultra-Realists who asserted that Universals *as such* have an existence in external nature and apart from the mind. Their doctrine assumed two different shapes. Some of them asserted that there exist outside of us certain universal forms, subsisting in themselves, eternal, immutable, invisible. When we entertain any universal idea, we really contemplate one of these wonderful forms. They are the types or patterns which are copied in existing things of which they are the original archetypes. When I think of Peter as a man, I am really contemplating an archetypal humanity realized in Peter. When I think of monkeys and their mischief, I am really contemplating an archetypal and eternal monkeydom, and an archetypal and eternal mischievousness, of which the objects before me are but an imperfect copy.

Now this form of Ultra-Realism is not so ridiculous as it at first sight appears; in fact, under a kindly interpretation, it is almost identical with the truth. These archetypal ideas have a real existence in the mind of God. They are contained in the Divine Intellect as the patterns after which all things were made, and man's power to recognize the universal type under the peculiarities of the individual is the result of his being made in the image of God, and therefore being able to rise above the concrete object to some sort of knowledge of the ideal type of which it is the imperfect representation. This was probably the meaning of Plato, and had Aristotle

been more decided in his Theism, and held the doctrine of Creation of all things by God, he probably would not have accused the Platonic theory of merely adding another to the list of phenomena.

If, however, this doctrine be interpreted as attributing to us a direct and immediate knowledge of the archetypal ideas as existing in the mind of God (as seems to have been taught by some of the Platonists), it is clearly false. Our knowledge would be no longer a knowledge of objects existing around us, but of the ideas in the mind of God, or else would be a direct pantheism, inasmuch as it would identify the archetype of the Divine intellect with the realization in the world of sense.

The second form of Ultra-Realism, said to have been taught by William of Champeaux and a few mediæval Logicians, was that the Universal exists as a Universal in individual things, that it exists outside of the mind in the same manner as it exists in the mind, that consequently there is no sort of difference between the two aspects of the Universal of which we have already spoken. This doctrine is now exploded. It is scarcely worth wasting words on its refutation. If the Universal as such is found in the individual things, apart from the mind that contemplates them, it ceases to be a Universal at all. On what ground can that which is found in an individual object be termed a Universal? Outside the mind everything has its own separate and determined nature distinct from all around it. To

ascribe to such a nature the character of Universality in itself, is a contradiction in terms. How can the same thing be Singular and Universal?

We must now recapitulate the leading points of the true doctrine on this subject.

1. The Universal nature at which the intellect arrives by abstraction, exists in the Individual object outside of us previously to and independently of any operation of the human intellect by means of which it is arrived at: it constitutes the essence of the object: it is that which makes it to be what it is—it is from this that all its essential qualities proceed.

2. The Universal nature which the intellect regards as the same is not the same in all the individuals as it exists in them in its objective reality. It is *alike* in all with a most perfect likeness. It copies the same pattern which is reproduced in each individual. But the copy is not the original, nor is one copy, though perfectly like all other copies, one and the same with them. "In three different subjects in which human nature is found there are three humanities," says St. Thomas "The unity or community of human nature exists, not according to the objective reality, but according to our consideration of it."[1]

3. The Universal nature is represented in the human intellect as one and the same in all. All our

[1] "In tribus suppositis humanæ naturæ sunt tres humanitates." (St. Thos., *Summa Theol.*, 1a q. 39. art. 3. *in corp.*) "Unitas seu communitas humanæ naturæ non est secundum rem, sed solum secundum considerationem." (*Ib.* art 4. ad 3um.)

conceptions are inadequate, and it is this very inadequacy which identifies for us things which, as they exist in their reality, are not identical.

4. The Universal nature exists *as a universal* in the human intellect by virtue of its power to recognize the common nature in the various members of a class. Thus the Universal as a Universal is apprehended by the human intellect as existing in the individuals, although it does not exist in them as a Universal, or we may say that it is formed by the human intellect, but *exists fundamentally* in the various individuals in which it is found, a principle which Scholastic Philosophy expresses by a phrase which is of the greatest importance,[1] furnishing the key to the whole doctrine of Universals.

[1] "Universalia sunt formaliter in mente, fundamentaliter in rebus ipsis."

## CHAPTER IX.

### ON THE HEADS OF PREDICABLES.

Recapitulation—Primary object of Thought—Direct and Reflex Cognition—First and Second Intentions—Heads of Predicables—Division of Heads of Predicables—Various kinds of Universals—Species—Genus—Differentia—Property—Accident—Summum Genus and Infima Species—Double aspect of Universals—Subaltern Classes—Two meanings of Species—Absolute Infima Species—Inseparable Accidents—False view of Infima Species—Mill's Real Kinds—Categories or Predicaments—Predicaments or Predicables.

WE have now had before us the various doctrines respecting Universals. We have seen that the errors respecting them are closely allied to the errors respecting Simple Apprehension or Conception. They commence with confusion of thought and they lead on to utter scepticism. These errors are multiform, but may be summed up under three heads:

1. The Ultra-Realists maintain that Universals as such have a real existence outside the mind—either as self-existent forms wandering about the world, or as existing in the Divine Intellect—and that when we form a general idea, the mind grasps one of these forms, or contemplates some of the ideas in the mind of God.

2. The Nominalists hold on the other hand that Universals as such have no sort of existence except in general names, which are a useful shorthand nomenclature under which classes may be summed up. When we form a general idea we really think of certain attributes which are individual, and which we observed in an individual, but which we assign to other individuals by reason of a supposed resemblance existing among them.

3. The Conceptualists assert that Universals exist in the mind, and are the creation of the mind, though based on certain similarities observed in a number of individuals: that, consequently, they are something relative, not absolute. In the act of Simple Apprehension we identify these similar attributes and give them a common name.

4. The Schoolmen, following Aristotle and St. Thomas, who may be called Moderate Realists, assert that Universals exist outside the mind but not *as Universals*, that in the act of Simple Apprehension the intellect abstracts from the individual apprehended the universal concept, and takes cognisance of the individual through the concept.

The result of this act of Apprehension is the concept or idea by means of which our intellect grasps the thing apprehended or concerned. For we must not forget that though Simple Apprehension consists in the formation of concepts, the primary and immediate object of the intellectual act is not the concept but the object of which it is the concept. When I stand before the cage in the Zoological Gardens and form an idea of what a monkey

is, when I say to myself respecting one of the creatures before me, "Here is a monkey," the first object of my thoughts is the individual monkey who gives rise to my reflections. My idea of a monkey is the means which I employ in order to comprehend the individual before me. It requires a further mental process to turn my thoughts away from the concrete individual to the idea that I have formed of it.

The fact that the first object of our thoughts is not the concept, but the individual through the concept, leads us to the difference between the two kinds of cognition, *direct* and *reflex*. In Direct Cognition we look directly and immediately to the nature of the individual, without comparing it with anything else. We look at it *through* the idea we form in the intellectual act by which we take cognisance of it, but we do not look at the idea itself. We always begin in all exercise of our minds with a direct cognition of the object which occupies them, and for this reason direct cognition is sometimes called an act of the *first intention*, because it is what the mind from its very constitution first *intends*, or turns its attention to, in the act it performs. When for instance I stand before a cage in the Zoological Gardens and contemplate one of the animals contained in it, and say, "This is a monkey," the primary object of my thoughts is the individual before me. I consider it through the medium of the idea monkey. My First Intention is to consider *this* monkey. My *idea* of monkey is the means I employ to comprehend this particular one of the class. I may

regard it under all kinds of aspects. I may turn my attention to its thick black hair, or to its grinning teeth, or to its fondness for nuts, or to the fact that it is suckling a little monkey at its breast, or to the malice with which it pinches another monkey which has offended it, but I am in each case considering the various peculiarities of this individual monkey. I am engaged in acts of the First Intention inasmuch as my first intention naturally turns on this particular monkey which has first attracted my notice.

But it requires a further and subsequent process to turn my mind from the contemplation of this particular individual to the contemplation of the nature of monkey in general, and the relation to each other of the various ideas that have been passing through my mind respecting it. I must *reflect* in order to decide whether the term *monkey*, as I understand it, is applicable to other creatures in the cage before me; whether not only this monkey but all monkeys are mischievous; whether its mischievousness is the same as its malice in pinching its unfortunate neighbour, or whether there is only an accidental connection between the two; whether in virtue of its monkeydom it walks on all fours instead of on two feet; whether there are monkeys who walk upright. In all these considerations I am exercising a Reflex Cognition in that the mind *reflects* or turns itself back to the consideration of the various ideas that are the result of its direct cognitions. I am performing acts which are Second Intentions of

the mind, in that the mind by a further and second intellectual act considers, under a new aspect, the various ideas formed in the acts of the first intention. It marshals them in order, that it may take cognisance of them, not as the media through which I apprehend the nature of the poor beast before me, but as separate entities having a certain relation to each other, which I apprehend in themselves as a part of my mental furniture. It contemplates them now as forms of thought which I compare together in order to discover their relations to each other, and to other individual objects to which they are applicable. I now put away the immediate and direct thought of this individual monkey, and I occupy myself immediately and directly with these ideas in themselves.[1] I reflect and say to myself: I have been looking at this object before me as a monkey. Why do I call it a monkey? What is the connection between this individual and the idea of monkey? Why again do I think of it as, and call it, an animal? What is the connection between monkey and animal? What again is the connection between monkey and hirsute? Are all monkeys hirsute?—and so on.

These Second Intentions of our thoughts, the

[1] Cf. St. Thos. Opusc. 44 (Ed. Rom. 48), I. 1; "Sed quia intellectus reflectitur supra se ipsum et supra ea quæ in eo sunt, sive subjective sive objective, considerat iterum hominem sic a se intellectum sine conditionibus materiæ: et videt quod talis natura cum tali universalitate seu abstractione intellecta potest attribui huic et illi individuo, et quod realiter est in hoc et illo individuo ideo format secundam intentionem de tali natura, et hanc vocat universale seu prædicabile vel hujusmodi.'

further aspect under which we contemplate the objects and the ideas about which we think, introduce us directly to what are called the five Heads of Predicables. But we may arrive at them by a different road. They are also the various divisions under which all Universal ideas are comprised.

We have already spoken of Transcendental and Non-transcendental as one of the divisions of ideas, and we said that Transcendental ideas were certain supreme and exhaustive notions which comprise, under one or another aspect, all existing things. Putting them aside, all other Universal ideas are limited and partial, inasmuch as they comprise only a certain limited number of individuals forming separate and distinct classes. But classes may be large or small, they may exclude or include each other. The class *living things* includes under it *cauliflowers*, *sand-eels*, *porcupines*, *mosquitoes*, *apple-trees*, *negroes*, *codfish*, and *members of the House of Legislature;* and these various classes mutually exclude one another. One class, on the other hand, may comprise a number of subordinate classes, each of which has other classes subordinate to it, as *living things* contains under it *vegetables* and *animals*, *vegetables* contains *trees*, *and herbs and shrubs*, *trees* contains *cherry-trees*, *apple-trees*, *plum-trees*, while *cherry-trees* may be broken up at once into individuals—all the individual cherry-trees real or possible.

Corresponding to these classes are Universal ideas or concepts, which express a part or the whole of the essential nature of the various indi-

viduals in which it is found, and the part contained will be large or small according as the class is a restricted or a wide one. The wider the class, the less of the nature contained in the concept. *Living thing* tells me very little about the individual monkey I am watching, or the plant I have been studying in the Horticultural Gardens. It is a concept which contains only a small portion of the essence of the individual. The narrower the class, the more I learn about the nature of the individuals, and the greater the amount of the essence of the individual contained in the concept. If any one says to me, "That object is a cherry-tree," I have (accidental differences excluded) all the information possible for man. I know its essential nature; the concept through which I regard it contains the whole of the essence of the individual.

Hence, we have one division of Universals according as the concept expresses the *whole* of the essential nature of the individual or only *part* of it.

But it does not follow that the idea which we form of any individual, expresses any part of its essential nature, although it must be in some way connected with it. It is not from every given class that the individual is *necessarily* excluded or *necessarily* included in it. There are many classes to which the individual belongs, many formalities under which he may be regarded, which are not a part of his essence, and do not constitute him what he is and what he always must remain. The *Duke of Fitz-battleaxe* is necessarily included in the class *man*, humanity is a part of his essence but he is not

necessarily *as a Duke* included in or excluded from the class of *good-looking*, or *rich*, or *well-mannered*. Nor indeed is he of absolute necessity included in the class of *members of the Higher Court of Legislature*, or of *creatures who cook their food*, or *who wear clothes*. There is nothing in the nature of things to prevent him from eating his food raw, or of going about unclad. Universals, therefore, may be, not a part of the essence of the individual, but something joined to it, either being present in some instances, but not in others (as for instance *riches* or *good manners* or *virtue* in the case of individual men): or being always present in point of fact, though the individual might still retain his proper nature, even though this particular quality were absent, as for instance *cooking food*, or *making exchanges*, or *using spoken language*.

This gives us five different kinds of Universals, according to the five possible relations of the concept and the individual in whom it exists.

1. The concept may express the *whole essence* of the individuals, in whom it is found, all else being merely accidental to them; that is to say, any smaller class that we may form than that expressed by the word standing for the concept, contains additional peculiarities which are not essential to the nature of the individuals. Thus *man* is said to contain the whole essence of the individuals contained under it. It is not an essential characteristic of John Smith that he is an *European*, or that he is a *gambler*, or that he is *given to too much whisky*, or that he is *long-limbed*, or that he has a *white skin*, or that he *trades with his neighbours*, or that he *has a*

*slight squint*, or that he *uses very bad language*, or that he *rarely, if ever, is seen inside a church.* When I have said that he is a *man*, I have set forth all that is essential to his nature, without having to include any of the amiable qualities aforesaid.

This furnishes the first of our Heads of Predicables.

SPECIES contains the *whole essence* of the individual, and a concept which thus includes the whole essence is said to be a *species* in reference to each and all of the individuals contained under the general term. Man in reference to John Smith (or any other member of the human race) is said to be the *species* to which John Smith belongs.

2. The concept may contain a *part of the essence* of the individuals. It may not express the whole of that which makes them to be what they are; nor the whole of their essential characteristics, but only some of them. I may break up the concept *man* into simpler concepts comprised in it. These simpler concepts will not contain the whole of the essence of John Smith, but they will contain a part of his essence. If, for instance, I say that he is an *animal* (not using the word in any uncomplimentary sense), I express only a part of his essential nature. Or, again, if I say that he is a *living being*, I express a still smaller part of that which is essential to him. If again I speak of him as *rational*, or *possessed of the power of forming abstract ideas*, I am expressing only a portion of his essence, that, namely, which distinguishes him as a man from all

other animals. I am assigning to him the *distinctive* or determining part of his essence.

Now in this last case the part of his essence which we express is obviously different from that which we express when we say that he is an *animal* or *living being*. *Animal* or *living being* are the names of wider classes, of more general concepts which have to be restricted by some distinguishing mark. They are called in scholastic language *partes determinabiles essentiæ*, parts of the essence representing classes which have to be limited in order that the whole essence may be expressed in the class-name. *Rational*, on the other hand, is the name of the quality which restricts one of these wider classes: it restricts *animal* to the species *man*. It is called the *pars determinans essentiæ*, the part of the essence which limits the wider concept in order that in the two combined the whole essence may be contained. The species *man* is thus composed of the concept *rational*, added to and determining the concept *animal*.

Thus we obtain two new Heads of Predicables corresponding to these two parts of the essence.

GENUS expresses the *pars determinabilis essentiæ*, or as it is sometimes called, the *material part*, inasmuch as the matter of which anything is made has to have its shape or essential characteristic given to it by something that forms or informs it. It represents the wider class which has somehow to be limited, in order to reach the species or class which is said to contain his whole essence.

DIFFERENTIA expresses the *pars determinans essentiæ*, or as it is sometimes called, the *formal* part, inasmuch as it *informs* or gives the form to the matter, and gives to what may be regarded as an unformed mass its distinguishing form or shape. It represents the limiting characteristic which has to be added to the wider class in order to limit the wider class as aforesaid.

3. The concept may contain *something which is joined to the essence*, either flowing from it as effect from cause, and so necessarily joined to it, or not connected with it as effect with cause, but holding such a relation to it that it might be there or not. In the former case the Universal is said to be peculiar to or a *property* of the individual. It is found in all members of the species. It is invariably and of necessity joined to their inner nature, with which it is connected so intimately that it is present wherever that nature is present and absent where it is absent. Thus *able to express his ideas by spoken or written language* is a Property of man. It is found in all men; it is invariably united to human nature. Yet it might be absent without encroaching on what is essential to humanity. There is no contradiction in the idea of a man who had a rational nature, yet could not convey his ideas to other men.

In the latter case, that is, if the attribute be not connected with the essential nature as effect with cause, it is said to be accidental to the individual. It may or may not be found in all members

of the class to which the individual belongs, but it is of such a nature that it does not necessarily accompany the inner nature of all the members of a class. It may be present or it may be absent. Thus *white, European, teetotaller, Mahometan, learned, virtuous, married,* &c., are Accidents of man. They are not in any way connected with humanity as such. Even if they were present in all men, still they would be Accidents. If every living man upon the face of the earth were to take the pledge (and keep it), or were to join the religion of the Prophet, still *teetotaller* and *Mussulman* would be Accidents of *humanity*. Hence an Accident is not merely a quality found in some members of a class, and not in others, but a quality found in some members of a class (and perhaps in all), but *unconnected with the essential nature* which constitutes the individual members of the class, and which is expressed in the idea or concept under which they are contained. Accordingly we may distinguish Accident into *Separable* and *Inseparable:* the former are found in some members of a class, but not in all; the latter are found in all the members of a class, though unconnected with its essence.

This gives us two fresh divisions:

PROPERTY, which is not part of the essence, but is necessarily joined to it by some law of causation, so that it is invariably found in each and all individuals who belong to the species.

ACCIDENT, which is not part of the essence or necessarily joined to it, but may or may not be

present in the individuals which belong to the species.

Hence we have Five Heads of Predicables; *Species, Genus, Differentia, Property, Accident.* They are arrived at by the following process of division:

Every predicable expresses either

| | | | |
|---|---|---|---|
| 1. Whole essence of individuals | | Species | (εἶδος). |
| 2. Part of essence | Material part | Genus | (γενος). |
| | Formal part | Differentia | (διαφορά). |
| 3. Something joined to essence | Necessarily | Property | (ἴδιον). |
| | Contingently | Accident | (συμβεβηκός). |

But why are they called *Heads of Predicables?* Because they are *predicated* of, or proclaimed as belonging to, a number of different individuals. We can assert each of them as true, not of one object alone, but of many. Moreover, they are the various divisions or heads of all possible concepts in their relation to each other and to the individuals of which we think; or, to put it another way, they are the among the results of our acts of *reflex* or indirect cognition.

There still remain several important considerations respecting some of them.

1. For each individual there may be many classes under which it falls from the highest of all (which is the first breaking up of the Universal, or rather the Transcendental concept of Being) down to the lowest before we come to individuals, the concept which expresses the whole of the essential nature of all the objects contained

under it. Between these there are a number of classes greater or smaller according as they approach more nearly to the concept of Being, or to the concept which is broken up directly into individuals and contains their whole essence.

This gives us a new division of *Genus* and *Species* respectively. We have first of all a Genus which can never be a Species; last of all a Species which can never be a Genus, and between the two a number of classes accommodating enough to be one or the other, as need shall require.

(*a*) The *Summum Genus* is the highest and largest class of all, the first breaking up of the Transcendental and all-embracing concept of Being.

(*b*) The *Infima Species* is the lowest and smallest class, the last Universal, the smallest collection of individual objects.

(*c*) *Subordinate*, or *Subaltern*, or *Intermediate* classes are respectively genera or species, according as we consider them in relation to the smaller classes below them, or the larger classes above them. In relation to the former they are genera; in relation to the latter they are species. Genera with regard to those below them; species with regard to those above them. Thus *animal* is a *genus* as compared with *man*, a *species* as compared with *beings that live*. *Mammals* is a *genus* in regard to *seals*, a *species* as compared with *animals*. *Jewels* is a *genus* with regard to *diamonds*, a *species* with regard to *stones*, or to *things without life*.

2. We have said that these universal concepts may be looked at in a double aspect. They are at

the same time something contained in the individual, and something under which the individual is contained. They are both ideas comprising attributes, and classes comprising individuals. *Man* as such is either an idea which, expressed in the abstract, is *humanity*, or a class belonging to the concrete order, and which may be termed *mankind*. In the scholastic language every Universal may be regarded as a *metaphysical* or a *logical* whole;[1] as a *metaphysical* whole it is a sort of bundle of attributes, as a *logical* whole it is a sort of bundle of individuals, actual and possible. Man as a metaphysical whole, as an abstract idea, comprises the attributes rational, sensitive, living, &c. Man, as a logical whole, as a class, comprises all the individual men who have existed, are in existence now, or who shall hereafter exist. As a metaphysical whole it contains metaphysical parts, the narrower concepts or attributes: as a logical whole it contains logical parts, the smaller classes or individual objects.

Now the contents of the concept under these two aspects are in an inverse ratio to each other; the greater the extension the fewer the attributes. This is the case throughout the series of classes

[1] There are other wholes which do not concern us as logicians, except in so far as we must be on our guard against confusing them with the logical and metaphysical whole. Thus there is the *Physical* whole, containing physical parts, viz., *matter* and *form*, or *substance* and *accident;* the *Collective* whole, where the parts are simply a number of separate things accidentally united, as a *regiment of soldiers* or a *heap of stones;* the *mathematical* whole, composed of mathematical and integrating parts, as a *tree*. *root*. *stem*. *branches*, *leaves*, &c.

which proceed from the highest to the lowest, from the *Summum Genus* to the *Infima Species.*

3. The *Summum Genus* as being the largest class next to the Transcendental concept of Being under which all existing objects can be ranged, cannot be subordinated to any higher *Genus*, therefore never can be a *Species.* It is the colonel of the regiment who can never be a subordinate officer, and is subject only to the Transcendental concept, which is the general in command of the whole army of existing things. It is called by the Greek logicians γένος γενικώτατον (the most generic of all genera). It has the *maximum of extension* inasmuch as it is the most extensive class under which the individual can be ranged, and it contains a maximum of members composing the class. It is, moreover, the *minimum of comprehension*, inasmuch as it is the simplest of all concepts, and so has a minimum of attributes contained in it. It is of all logical wholes the greatest; of all metaphysical wholes the smallest.

4. The *Infima Species* as being the last class we come to previous to the individuals, is subordinate to all the classes above it, and therefore never can be a *genus.* It is the lance-corporal, the lowest of non-commissioned officers, who never can have any command, except over private soldiers. It is called by the Greek logicians εἶδος εἰδικώτατον, the most specific of all species. It is the *minimum of extension*, inasmuch as it is the least extensive of all classes under which the individual can be ranged. It is, moreover, the *maximum of comprehension*, inasmuch as it is the most compre-

hensive of all ideas, and so has a maximum of qualities or attributes contained in it. It is of all logical wholes the smallest, of all metaphysical wholes the greatest.

5. Between the *Summum Genus* and the *Infima Species* there are a number of classes which are called *Subalterns*, and which are subordinate to all the classes above them, while the classes below them are subordinate to them. They take the character of genus or species, according as we compare them with a class below, or with a class above them. They are the various officers of the regiment, commissioned and non-commissioned, who are between the colonel in command of the whole regiment and the corporal, who commands nothing but private soldiers. They are called by Greek logicians *subaltern genera* (*γένη συνάλληλα*). They contain under them more individuals in proportion as they approach to the *Summum Genus*, but fewer qualities. They contain in them more qualities in proportion as they approach the *Infima Species*, but fewer individuals. They are both logical and metaphysical wholes: logical wholes in respect of the smaller classes and individuals contained under them, Metaphysical wholes in respect of the narrower concepts or qualities contained in them.

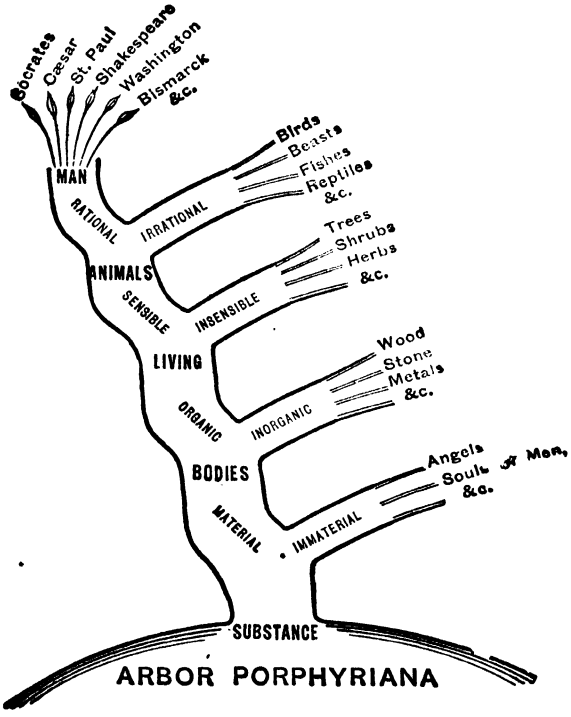
We observe, therefore, that *Species* is used in two rather different senses. 1. Sometimes it means that class which contains the *whole essence of the individuals* contained under it, and which, therefore, has no species beneath it. This is the *Infima Species*, and none other. 2. Sometimes it means that class

which contains the *whole essence* common to the concepts contained in it, and also the smaller classes into which it is immediately broken up. Thus *animal* is the species of *men* and *brutes* taken together, as containing the nature common to both of them. This is the *Subaltern Species*, which holds the same relation to the species which immediately come under it, when they are regarded in respect of what is common to all of them, that the *Infima Species* holds in relation to the individuals. It is, therefore, called *Species* in relation to those immediately subordinate species, in contrast to the classes above it, which are called *genera* in relation to them. Just as *man* contains the whole of the nature common to John, Peter, Susan, Jane, &c., so does *animal* the whole nature common to men, birds, beasts, fishes, insects, &c.

We may now illustrate what we have been saying by the familiar Porphyrian tree. At the root lies the *Summum Genus*, Substance, while the leaves represent individual objects. We shall pursue only one branch, that which is to lead to individual *men*. We begin by breaking up the *Summum Genus* of substance into *material* and *immaterial*, and as men are material beings, we fix our attention on material substances, or *Bodies*. We then break up Bodies into *Organic*[1] and *Inorganic*, and as *men* have organized bodies, we add Organic to body and thus obtain the further class of *Living things*. But still

[1] It may be well to warn the reader that *organic* is not used here in the sense which it has acquired in the vocabulary of modern chemistry, but is simply equivalent to *organized*.

we are far from *man*. Some living things are *sensitive* to pleasure, pain, &c., others are not. An apple-tree does not, as far as we know, suffer from dyspepsia, or a cabbage from headaches; and we select in our pro-




gress towards the human kind those bodies which can feel pain. We thus obtain *animals*, and *man* begins to dawn upon our view. But we have not reached

him yet, and we must therefore break up animals. We must narrow the class by the addition of *rational*, and thus we reach at last the *Infima species* of *rational animal* or *man*. *Man* we cannot break up, except into individuals, Socrates, Cæsar, St. Paul, Shakespeare, &c.

But here a difficulty meets us. Why is man an *Infima Species?* Why should we not break him up into *white* and *coloured*, *virtuous* and *vicious*, *heathen* and *Christian*, *European*, *Asiatic*, *American*, *African*, and *Australasian?* If we give as the reason that *man* contains all the essence of individual men we seem to be answering beside the point. For what do we mean by *essence?* That which makes them to be what they are. But does not their education, parentage, place of birth, &c., make them to be what they are and contribute to their formation? Why then should we not make lower classes based on these considerations? Now, if we examine these various differentiating qualities by which it is proposed to form classes narrower than that of man, we shall find that many of them are eliminated by the fact that they can be separated even from the individual. A man who is *vicious* one day may be *virtuous* the next: a *heathen* may become *christian*. These therefore are separable accidents of the individual and cannot belong to his inner nature.

But there are others which are not separable from the individual. A *blackamoor* can never become white, an *Asiatic* remains an Asiatic (in the proper sense of being born in Asia of Asiatic parents) even though he may have passed seventy years in Europe

or America. These then we may call *inseparable accidents of the individual*, and the united sum of them may be called his *Differentia* (in a wide sense of the term) inasmuch as he is marked off from other men by his height, colour, speech, intelligence, and strength, together with all those other qualities which, taken collectively, characterize him as an individual.

But it is not enough that a quality should be inseparable either from an individual or from a class, in order to constitute it part of its essence or inner nature. It must be not only inseparable in *fact* but also inseparable in *thought*. It must be in such a relation to the rest of his nature that it could not be changed without introducing a contradiction into his nature. *Essences are indivisible*, say scholastic logicians, as well as *immutable*. They cannot be changed, and we cannot think of them as changed, without an anomaly presenting itself in the nature, an element of which has been thus reversed.

This then is the test in the case of individuals and of classes alike. In order to discover what is a part of their essence we must ask: If I took away this or that quality, if I reversed it, would their nature simply remain the same as before, save only that this one attribute has disappeared? If it would, then the attribute in question is no part of the essence. But if there would be a general disturbance, if there would be a general change in the whole nature, then such a quality belongs tc the essence and is part of the inner nature.

Now, if we apply this test to all the various qualities by which we proposed above to break up *man* into lower classes, we shall find that every one of them might be conceived as reversed without the *man*, so to speak, losing his identity. If he is an *European*, he will not have his nature changed if we suppose him born in Asia; if he is a man of talent, he will still remain the same individual man if by some strange transformation he becomes a dullard. If he is a *negro*, we can think of him as remaining in all respects the same, though his skin should become white. If he is *cross-grained*, his identity will be the same, even though he overcomes himself and becomes the sweetest-tempered man on the face of the earth.

But if we take any of the attributes which belong *to man as such*, it is quite different. Take away from man the faculty of *sensation* and he is a different being at once. He can perceive none of the things around him, cannot sustain his life, cannot avoid dangers, cannot gather the materials for general concepts, cannot exercise his reason. This faculty is so interlaced with the other faculties of man, that it cannot be separated even in thought without destroying his nature. So it is with all the other qualities which make up the concept *man*, and we are therefore justified in saying that each and all of these belong to the *essence* of the individual and are not separable from him either in fact or thought.

We may express this in other words by saying that we have the power of discerning the *essences* of

things, of piercing through the characteristics of the individual to the essential nature underlying it. When we have any object presented to us we are enabled by the reason that God has given us to see what qualities belong to the *individual* (and this whether they are in practice separable or inseparable from him) and what belong to the *species* to which he appertains. This is what is meant by the faculty of *abstraction*, by means of which we neglect the individuating qualities, and fix our minds only on those which constitute the *specific concept* under which the individual is ranged by virtue of his inner and essential nature.

The existence of an absolute *Infima Species*, which is broken up at once into individuals and below which no lower species can be framed, is of course denied by modern logicians, who depart from the doctrine of Aristotle and the Scholastics. "In point of fact," says Sir. W. Hamilton, "it is impossible in theory to reach any lowest species; for we can always conceive some difference by which any concept may be divided *ad infinitum*. This, however, as it is only a speculative curiosity, like the infinitesimal divisibility of matter, may be thrown out of view in practice." This "speculative curiosity," which our modern conceptualist puts aside with such jaunty ease, really involves the whole question of the formation of Universals, and on our decision respecting it depends the absolute character of Truth. If essences are realities, not figments of the human mind; if man possesses an intellect capable of discerning the invisible under the visible,

the inner nature under the external manifestation of it; if we have faculties which are different in kind from those of the brutes, and which enable us to take cognisance not only of *phenomena* but of *noumena*, not only of things transitory and perishable but of things immutable and eternal—this doctrine of an absolute *Infima Species*, is a necessary element in our philosophical convictions, the absence of which would involve us in a number of serious contradictions and would render the attainment of Truth a thing impossible to the whole human race.

On the other hand, Mill and Bain,[1] and those to whom we have given the name of the Modern Nominalists, concede with a greater appreciation of truth, but with very considerable inconsistency, the existence of what they call *real* or *natural* kinds, which are distinguished from those *artificial* kinds which the mind fashions for itself. "A real kind," says Mill, "is one which is distinguished from all other classes by an indefinite multitude of properties not derivable from each other." This is one of several cases in which the school of Mill approximates to the Aristotelian philosophy, but in so doing he does but thereby the more completely condemn his own system. If *kinds* are *real*, if we do but recognize the distinctions which already exist in nature, the whole system of scholastic realism is by such an acknowledgment virtually recognized to be true. What constitutes the reality of those kinds save that the same generic or specific nature is found in all the individuals belonging to any one

[1] Mill, *Logic*, i. 137; Bain. *Logic*, i. 69.

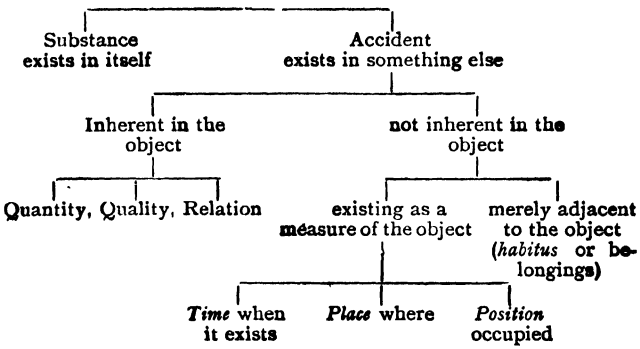
of them? The identity of what are called common attributes is no longer a convenient fiction of our intelligence, but is based on an objective fact, which is true independently of the intelligence which takes cognisance of it.

At the other end of the series to the *Infima Species* which breaks up into individuals, is the *Summum Genus*, which cannot be broken up into any classes beyond it. In our tree given above we have *substance* as the *Summum Genus*. If we had started from something which does not exist in itself, but in something else, we should have had *accident* as our *Summum Genus*. Everything must either exist in itself or it must inhere in something else. If the former, it falls under the class of Substances, complete or incomplete; if the latter, under the class of Accidents: and therefore Substance and Accidents are the two *Summa Genera*, the two all-embracing classes, to one or other of which all terrestrial things capable of being conceived in thought belong, since everything has an existence either in *itself*, and that may be called its own, or else *in something else*, on which it depends and in which it inheres.

If the latter, *i.e.*, if it inheres in some other object it is an Accident, or *mode of being* of that object. The Accidents are nine in number, and are arrived at as follows: Every mode of being which can be ascribed to an object either expresses something inherent in it, or something outside of it, which, however, in some way affects and characterizes it. In the former case the

inherent mode of being either proceeds from the material element in the object (*quantity*), or from its formal or distinguishing element (*quality*), or from the bearing of something within it to something without (*relation*). For instance, the fact that a man weighs fifteen stone proceeds from his material element and belongs to the category of *quantity;* his wisdom or goodness from the characteristics determining his nature, and therefore falls under the category of *quality;* his being older or younger than his brother is clearly an instance of his *relation* to something outside. If, however, the manner of being ascribed to it is derived from something external to it, it is derived from something which it works outside of itself (*action*), or from something which is worked in it (*passion*), or from something which is regarded as its measure, viz., the *time when* it exists, or the *place where* it exists, or its *attitude*, that is, the position in space which its several parts occupy. Or last of all that which is externally related to it may be something which is not its measure, but is attached to it, and so in some way characterizes it as one of its *surroundings* or *belongings*. For instance, the so-called Accidents of man derived from things external to himself are that he is killing, or comforting, or helping; in which case we have various forms of *action;* or else he is *being* killed, or comforted, or helped, and then he is *passive;* or if his position *in space* is described, he is characterized as here or there, near or far. If in time, he is one who belongs to the fourteenth century, or *to the present time*, whereas his *attitude* is that he is

sitting down or standing up, cross-legged, or sprawling, &c. Finally his *surroundings* or *belongings* (*habitus*) adjacent to him in space constitute his dress or equipments. He is armed with a rifle or has on a tall hat, or Wellington boots. We may put this in tabular form.




To recapitulate: If we say anything about some object which has an existence of its own, we must speak either of its quantity (*quantitas*) or its qualities (*qualitas*) or its relation (*relatio*) the things around it; what it is doing (*actio*) or what is being done to it (*passio*); of the place (*ubi*) or time (*quando*) of its existence, or of its position (*situs*) or external belongings (*habitus*). These form the nine different classes under one or other of which every Accident must fall, and these added to Substance form the ten Categories, as they are called by Aristotle, under which all ideas or concepts ultimately fall. In scholastic logic they are called *prædicamenta* or *predicaments*; and as when any idea gets into

one of them it can get no further, hence has arisen, by a strange freak of language, the familiar expression of "getting into a predicament," to express the unpleasant situation of one who has involved himself in circumstances from which he would fain escape but cannot.[1]

But what is the difference between the Predicaments or Categories and the Heads of Predicables? The Categories are a classification of all existing things as they are in themselves, regarded in their own proper being, as the object of our mental concepts or ideas, as capable of being introduced into our minds and forming part of our mental furniture. Thus, if we are asked under what category tree falls, we answer at once: "Tree is a substance, *i.e.*, has an independent existence of its own." Under what category does goodness fall? "Under the category of *quality*." In the same way son or *master* falls under *relation*, *to-morrow* falls under the category of *time*, *ill-treated* under the category of *passio*, &c.

The Heads of Predicables are, on the other hand, a classification of the forms of thought, that is to say, of the various relations our ideas or concepts bear to each other. They put our mental furniture

[1] The Predicaments or Categories are enumerated in the following distich:

Summa decem: Quantum, Substantia, Quale, Relatio,
Actio, Passio, ubi, Quando, situs, habitus.

The Greek equivalent, no less than the Latin, requires an apology for the false quantity and other defects of versification

Εἰσὶ κατηγόριαι· ποῖον, πόσον, οὐσία, πρός τι,
ποιεῖν καὶ πάσχειν, ποῦ, πότε, κεῖσθαι, ἔχειν.

in order and express the connection between the ideas which constitute it. They express the kinship of our mental conceptions—the connection between the concepts or ideas present to our intellect under their aspect of *entia rationis* (to use the scholastic expression), that is, as things which derive their being from human thought, which are manufactured by the mind, though the material comes from outside. They are not the classes into which external objects can be divided, but the classes under which our ideas or concepts of external objects fall in respect of each other. If I am asked under what predicable does *tree* fall? I have to compare the concept of *tree* with other concepts before I can answer the question. *Tree*, I answer, is a *genus* in respect of *oak*, a *species* in respect of *living thing*. Under what predicable must *good* be classed? I cannot answer the question until you tell me with what other concept it is to be compared. *Goodness*, if you mean moral goodness, is an *accident* of man, but is a *property* of the inhabitants of Heaven, inasmuch as it flows from that confirmed sanctity, which is the essential mark of the saints who have attained their reward.

There are, however, two classes of concepts which can be classified at once without reference to any other concept, if only a sufficient study of the *matter* has made us acquainted with their essential nature. *Infima Species* and *Summum Genus* are fixed and absolute, as we have already seen. Under what category does man fall? I can answer at once: it is the *species* which expresses the whole

essential nature of the individuals contained in it. So again, tiger, oak, eagle. Under what category does Substance fall? Here too the reply is ready. "Substance is a *Summum Genus* and can be nothing else."

Hence the Categories are sometimes said to be an enumeration of things as they come under the *first intentions* of the mind, that is, under our direct acts of cognition. As we explained above[1] the Predicables are an enumeration of the *second intentions* of the mind, of our indirect or *reflex* cognitions, inasmuch as they are a relative classification of the concepts we form of things, viewed in their mutual connection with each other.

# CHAPTER X.

## ON DEFINITION.

Recapitulation—Importance of definite use of words—Dangers of Indefiniteness—Definition and Definiteness—What is Definition?—Real and Nominal Definition—Nominal Definition—Real Definition—Various kinds of Real Definition—Description, or Accidental Definition—Essential Definition—Physical Definition—Definition Proper—Usefulness of Definition—Various meanings of the word "Impossible"—Value of Definition—Theory of Definition—Definition in practice—First Rule of Definition—Difficulty of Definition—Second Rule of Definition—Defective Definitions—Definition by Synonym—Negative Definition—Third Rule of Definition—Definition by Metaphor bad—Ambiguities to be avoided—Far-fetched expressions undesirable.

In the last chapter we explained the difference between Direct and Reflex Cognition, and the meaning of those mysterious entities, First and Second Intentions, and thus we passed to the consideration of the Heads of Predicables. We saw that they are five in number: *Genus*, *Species*, *Differentia*, *Property*, and *Accident*, according as they express (1) the material part of the essential nature of any individual, or (2) the whole of it, or (3) its distinguishing characteristic (or formal part), or (4) something always joined to it of necessity, or (5) something which may be joined to it or not. We further explained the absolute nature of the

*Summum Genus* and the *Infima Species* against Sir William Hamilton and other moderns, and remarked on the inconsistency of Mill and Bain in conceding the existence of *real* as distinguished from *artificial* kinds, by which they offer to truth a tribute which is subversive of their own modern inventions. Finally, we said a word about the Categories or Predicaments, the enumeration of all existing things as they are the object of our direct as opposed to our reflex cognitions. We now proceed to a different but no less important portion of our subject.

One of the most fruitful sources of human error is a misty, indistinct apprehension of the meaning of the terms we use. A man often has a general impression of the ideas conveyed by the words he employs, without any precise and accurate realization of their true sense. He has never analyzed the idea in his own mind corresponding to the external expression of it. He has not asked himself what are its precise limits, whether the word used has more meanings than one, and what is the connection between these varying significations. His knowledge of it is like our knowledge of some distant object upon the horizon, seen through the haze of early morn. We are not sure whether there is one object or two; whether it is on the earth or in the heaven; whether it is a horse, or a donkey, or a cow, or a stunted tree; we judge of it rather from our personal experiences of the past, than from any well ascertained data respecting it in the present: perhaps we hurry to an entirely false conclusion regarding it and find ourselves entirely mistaken

as to its colour, shape, size, position, if at some future time we have a better opportunity of studying its nature.

So, too, it is with our use of words: we assign to them qualities altogether absent from the concept they express; we have no definite grasp of the true nature of their object; we have a vague, hazy notion in our minds that certain attributes, which observation has taught us to assign to many members of the class of objects they represent, are really a part of the essential nature of those objects, and therefore included in the idea we have of them; but we do not feel at all certain whether it is so, or whether we may not have been too hasty in regarding as necessary to all what may be limited to some individuals only, or at least not requisite to all, and therefore only accidents, separable or inseparable, of the class to which those individuals belong.

Every one must have encountered in his own experience countless instances of error arising from this source. If you tell an uneducated or half-educated man that his soul is a *substance*, he will think you are laughing at him. "A *substance!*" he will reply; "why a substance is something you can touch or feel." In the same way the Agnostic objects to a personal God on the ground that personality as known to us is something limited: whereas there can be nothing limited in God. In each case the error arises from an inexact notion of the essential qualities of substance and person. Because the substances of ordinary life are those which are perceptible by the senses, the inference is wrongly

drawn that palpable is a necessary quality of substance: because the persons around us are limited beings, the Atheist hurries on to the false proposition, *All persons are finite beings.* When the Protestant talks about the unscriptural and untrue doctrine of *Intention* taught by the Catholic Church, the bugbear from which he shrinks is generally an indefinite and undefined something, the true nature of which he has never realized to himself.

It is the business of Logic in its capacity of a mental medicine, to teach us to be exact in our processes of thought, and so to avoid the errors arising from inexactitude. It enables us to have a well-defined view of what was ill-defined before. It furnishes the glass that renders sharp in its outline what without it seemed to fade away into the objects around. It puts into our hands the means of testing and trying the accuracy of our concepts, and of ascertaining whether they are in accordance with objective realities.

Among the various instruments employed by Logic for this end, one of the most valuable is the process of Definition. Its very name implies that it has for its object to mark out or define the boundaries of our notions, to see that they do not intrude one upon the other and so generate confusion in our thoughts. He who is in the habit of defining to himself the terms he uses, of analyzing the contents of his ideas, has a ready test of the presence of mental error. Error, mental or moral, hates to be dragged to the light of day, and there is no more powerful agent in performing this useful

service, than the mental process which demands of us, with an authority which we cannot set aside, an answer to the question: What is the exact nature of the object of which you are thinking or speaking? We are thus brought face to face with our own thoughts, and what we previously imagined we thoroughly and perfectly understood we find to be so confused and obscure as to expose us to the danger of wandering far away from the truth respecting it.

Definition is the unfolding of the nature of an object. As conveyed by human speech it is an expression by which we answer the question: What is the object to be defined? It is an analysis of that which makes it to be what it is. It is the breaking up of the concept into the simpler concepts that are its constituent parts. It is a setting forth of the essence of the thing defined.

But in defining any object we must distinguish between the Definition which explains primarily the nature of the *object* and that which explains primarily the nature of the *word*, and the nature of the object only in as far as it is explained in the meaning of the word. The first of these is called the *Real*, the second the *Nominal* Definition. In giving the Real Definition we use a different expression from that which we employ in Nominal Definition. In the former case we say: such and such an *object is*, &c.; in the latter, such and such a *word means*, &c.

Thus the Real Definition of triangle is: *Triangle is a three-sided figure*, whereas the Nominal Definition is: *Triangle means a figure which contains three angles.*

Real Definition analyzes the notion of triangle present to the mind. When we think of a triangle what is most prominent before us is the three sides rather than the three angles; it is its three-sidedness which constitutes its essence. Nominal Definition explains the word triangle. If we ask ourselves, what does the word triangle mean? We naturally answer that it means a figure with three angles. The word makes us think of the three angles first, and the three-sidedness is a further quality which results from its triangularity.

I. Nominal Definition is of various kinds:

1. Nominal Definition proper, which explains the ordinary meaning of the word as current in the mouths of men. Thus the Nominal Definition of *angel* would be a *messenger* (ἄγγελος); the Nominal Definition of *laughing-gas* would be *a gas which renders you so insensible to pain that you can laugh at it*, or *a gas which incites to laughter*. Such a definition generally is connected with etymology, but not necessarily so. Thus centaur has for its Nominal Definition, *A monster half-horse half-man*, but this has nothing to do with the etymology of the word. In this first kind of Nominal Definition we do not lose sight of the existence of the object, the name of which we are defining; but we define the object through its name.

2. Nominal Definition which simply explains the word according to its derivation, *e.g.*, Sycophant *a shewer of figs* (σῦκον φαίνω); Lilliputian, *an inhabitant of the island of Lilliput;* Athlete, *one who contends for a prize;* Blueberry, *a shrub with blue*

*berries on it.* In this case we lose sight altogether of the object and simply think of the grammatical meaning of the word before us. We break it up into its constituent elements in the same or some other language.

3. Nominal or Conventional Definition, which consists in a meaning given to the word by the speaker, or agreed upon by disputants. Thus if in discussing the growth of a man's opinions it was arranged that the word *consistency* should be used, not of the compatibility of opinions held by the same person at the same time, but of the identity of his opinions at different periods of his life, we might call such a definition *nominal* as opposed to *real*, inasmuch as it was a meaning arbitrarily given to the word, rather than an analysis of the idea expressed by it. In this sense a man might say that political consistency is a doubtful virtue, meaning that the opinions of wise men are modified by time; whereas if we use consistency in its ordinary application to the opinions held simultaneously, the absence of it would at once condemn the doctrines which thus merited the accusation of inconsistency. In the same way if some writer or school of writers give their own meaning to a word in general use, turning it aside somewhat from its ordinary application, the definition of the word thus used would be a nominal one, and would fall under this third class of which we are speaking. For instance, when moral theologians talk of *probability* of opinions not as meaning they are more likely to be true than false, but that there is some sclid ground for maintaining them, even

though the ground for denying them be no less solid, the definition of *probability* in this sense would be a Nominal Definition, inasmuch as the word is used not in the ordinary meaning which the common sense of mankind attaches to the word, but in another specially attached to it by the authors in question.

II. Passing on to Real Definition, we observe in general that its object is to unfold primarily the *nature* of the thing defined, and that if it also explains the meaning of the word, it is because the word accurately represents in the minds of men the nature of the object for which it stands. But the nature of the object is a wide term, and may be taken to include an almost unlimited territory if it is used in its widest signification. A thorough knowledge of the nature of any object includes a knowledge of its history, of its first origin, of the causes that produced it, of the end for which it exists, of all that has influenced its development, of all that it is capable of effecting, of the various accidents that have befallen it, nay, of all that may hereafter change or affect it in the future. The field has no limits, and a thorough knowledge of the nature of an object is possible only to a being of an altogether higher order to ourselves. Take, for example, the nature of man. What a miserably imperfect knowledge of human nature is possessed even by those who have the deepest insight into it! What an infinitesimal portion of its ten thousand possible variations is possessed by the wisest of men! If we are to sound it to the lowest depths

we must know the story of man's first creation, of his days of early innocence and subsequent guilt. We must be acquainted not merely with the great events which affected the character of the whole human race, but the history of every nation, every tribe, nay, every family and individual from the beginning of the world until now. We must not only have studied the indefinite varieties of character existing among men, but we must have watched the causes which produced these various types, we must have closely observed the effects of external circumstances, the handing down of physical and mental excellences and defects from parent to child, the moulding of the individual under the powerful influence of early education, the results of obedience to, or rebellion against, the internal voice of conscience. All this, and much more, would be included in a complete knowledge of human nature, and we could not give an exhaustive account of man as he is unless all this were comprised in what we had to say of him.

But in any sort of definition, however wide be our acceptation of the term, it is clear that all this cannot be included. Even if our analysis of that which has made man to be what he is, extend to the past as the present, to what is accidental as well as what is strictly necessary and essential, we can but give the most prominent features of the story of his development, and the most important of the peculiarities which mark him off from all things round. We may, however, put forward a countless variety of circumstances respecting him.

and these we find will fall naturally into three different heads or classes, into which real definition may be divided.

1. Description, or Accidental Definition, which gives not the essential characteristics constituting the nature of the object defined, but certain circumstances attaching to it which serve to mark it off from all other objects. These circumstances may be either:

(*a*) *Properties*, in which case the description approaches nearly to Definition strictly so-called, as: *Man is a being composed of body and soul, and possessed of the faculty of articulate speech;* or, *Man is a biped, who cooks his food*, or, *Man is an animal capable of practising virtue or vice.*

(*b*) *Accidents*, which, though separately common to other objects beside the thing defined, yet combined together, mark limits exactly co-extensive with it, as: *Man is a biped, resembling a monkey in form, with a brain proportionately larger than that of the class to which he belongs;* or, *An Albatross is a bird found between the 30th and 40th degree of south latitude, whose plumage is of glossy whiteness streaked with brown or green, whose wings measure ten or eleven feet from tip to tip, and familiar to the readers of Coleridge's Ancient Mariner;* or, *A lion is one of the chief quadrupeds, fierce, brave, and roaring terribly, and used in Holy Scripture to illustrate the savage malice of the devil;* or, *Mangold-wurzel is a kind of beet-root, commonly used as food for cattle;* or, *A cricket is an insect allied to the grasshopper, that makes a chirping noise with the covers of its wings.*

This kind of definition belongs to rhetoric, rather than to philosophy. It is the only sort of definition which can be given of individual objects, since they are discerned from other members of the class to which they belong only by these accidental marks, as *The Duke of Wellington was an English general, who fought with great distinction in Spain and the Low Countries against Napoleon, and finally crushed him in a decisive battle at Waterloo;* or, *Noah was the builder of the Ark, who was saved with all his family from the Deluge;* or, *Marcus Curtius was a Roman of good family, who jumped into the gulf at Rome at the command of the oracle.*

The various circumstances which may combine to mark off the object to be defined from all else are almost unlimited in number. Sometimes they consist in the *causes* which gave it its origin, as, for instance, *Man is a being created by Almighty God from the slime of the ground, and endowed by Him with a rational soul*—here God is the *efficient* cause of man, the slime of the ground the *material* cause, the rational soul the *formal* cause; or, *A bust is a figure consisting of head and shoulders made after the likeness of some human being by a sculptor or statuary*—here the sculptor is the *efficient cause*, and the human being who is copied is the *causa exemplaris*, or pattern after which it is made; or, *A clock is a mechanical instrument which is to indicate the time to eye or ear;* or, *Man is a being created to praise, revere, and serve his Creator, and so to attain eternal happiness*, where the marking of time and the service of God are the *final* causes of clock and man respectively. Some-

times it gives the *manner* in which it comes into being, in which cases it is called a *genetic* Definition, as, *A cusp is a curve traced by some fixed point in a circle as it travels along a straight line;* or, *A circle is a curve generated by the extremity of a straight line revolving round a fixed centre.*

2. Essential Definition gives the real nature of the object, sets forth that which makes it what it is, breaks it up into the various parts of which it is composed. But these parts may either be those which can be separated the one from the other, and can actually exist apart, in which case they are called the *physical* parts of the object, or they are inseparable in fact, and can only be separated in thought, in which case they are called *metaphysical* parts. In the former case it is the actual object which is actually divided, as, for instance, if we divide *man* into a *rational soul* and an *organized body.* In the latter it is the idea of the object which is broken up into the ideas which composed it, as, for instance, if we divide *man* into *rational* and *animal.*

Corresponding to these physical and metaphysical components we have two kinds of Definition, viz., Physical Definition, which breaks up the thing defined into its physical parts, and Metaphysical Definition, which breaks up the thing defined into its metaphysical parts. Physical Definition does not merit the name of Definition properly so-called, since in Logic we have to deal with the external object as presented to us in intellectual cognition, and intellectual cognition as concerned with the essential idea of the object, not with the object as

it exists in the external world and comes within the range of sense. As a logician I have nothing to do with the component parts of man in the physical order. I have no claim to decide on the question of the simpler elements which are united in his composite nature. I am concerned only with the component parts of man as he exists in the mind; primarily in the mind of his Creator, and secondarily of all rational beings, who by their possession of reason can form an idea or intellectual image of man, corresponding to that which exists in the mind of God.

Physical Definition is a *description* rather than a *definition proper*—it gives characteristics which are accidents or properties of the object under its logical aspect, not those which make its nature to be what it is. Sometimes it is not a *real*, but only a *nominal* definition, inasmuch as it analyzes, not the object to be defined so much as the word, as if I define *hydrochloric acid* as *an acid composed of hydrogen and chlorine.*

3. Last of all we come to Definition *proper*, or Logical Definition. In a definition we do not attempt to break up our idea of the object to be defined into its simplest constituent elements, for this would be an endless task, but to give the higher class, (or *proximate genus* as it is called), under which it comes, and the distinguishing characteristic (or *differentia*) which separates it from the other subordinate classes coming under the genus. But we must explain a little more at length what it is that Definition does for us.

All error respecting the nature of any object consists in attributing to it qualities which it does not possess, or in denying to it those that are really to be found in it; or, as we remarked at the commencement of the present chapter, we may be involved in a vague uncertainty whether this or that quality belong to it or not. In this latter case our knowledge is defective, rather than erroneous; and so long as we do not affirm or deny anything concerning it of which we are not certain, but suspend our judgment, we are ignorant rather than mistaken, and only exercise a prudent reserve, if we do not commit ourselves respecting any object which is beyond our reach.

But error and ignorance alike are evils which philosophy seeks to abolish, and though it is not the business of logic *ex professo* to add to the material of our knowledge, yet it plays a most important part by laying down laws which regulate all intellectual acts correctly performed. If it does not add to our knowledge, it guides us in adding to our knowledge, and furnishes us with varied means of detecting the error which in our human frailty we have unwittingly adopted as a part of our mental furniture. It drags the impostor to the light, and enables us to see that he is not clad in the wedding garment of truth. It warns us that we must cast him forth into the outer darkness of the realm of falsehood. It clears away the mist which has so long enabled him to lurk undisturbed in our intelligence, and shows him in his naked hideousness, in contrast to the fair children of light. It

quickens that instinctive perception of truth which is one of the privileges we enjoy as the children of the God of truth, and which no amount of sin or wilful blindness can ever wholly eradicate, though it may deaden and impair its power and hinder or thwart the exercise of it.

In this invaluable service rendered by Logic, Definition plays a very important part. If men would only define their terms they would escape three-fourths of the fallacies that are prevalent in the world. It is because their notions are misty and undefined that they so often go astray. They are misled by analogy of meaning and confuse it with identity of meaning. We will illustrate our meaning by the various uses of the word *Impossible.* When the Unbeliever objects to the doctrine of the Real Presence in the Blessed Sacrament of the Altar that it is *impossible* that our Lord's Body should be at the same time in Heaven and in the Sacred Host on earth, his objection is based on the want of any clear perception of the various meanings of the word *impossible.* He forgets that the term is employed in different senses between which there is a certain analogy, but which must be carefully distinguished from each other.

If I were to give the letters of the alphabet all in a heap to a blind man and tell him to lay them out on the floor, and, on looking at them, were to find that they had arranged themselves in their proper order, I should at once gather that some one had guided his hand. If he were to assert that they had so arranged them-

selves by chance, I should refuse to believe it, and say that it was *quite impossible.* I should mean by this not that it was *absolutely* impossible, but that it was so impossible as to be *morally* or practically impossible. There is nothing to prevent the letters from presenting themselves in the order a, b, c, d, &c., any more than in the order they practically do happen to assume, but nevertheless I should say, and say rightly, that the thing was *impossible,* that is, that the chances are so overwhelming against any one arrangement as to justify the assertion that it could not have come about without design.

But the sense of the word is very different when I say that it is *impossible* that a man who has been blind from his youth should be cured in an instant by washing his eyes in a fountain of water. Here I do not mean merely that it is highly improbable, but that such a cure is altogether at variance with the ascertained laws of nature. If I believe in a Personal Author of these laws, I believe that it is possible that He who made them can interrupt their operation, and I shall not dismiss without investigation the statement, that the occasion of this sudden cure, which is irreconcileable with their ordinary working, is the bathing the eyes that have never seen the light, in some spring or fountain which has the reputation of being miraculous. In this case I mean by *impossible* not so utterly improbable under ordinary circumstances as to be in a wide and loose sense impossible, but actually *in contradiction with certain well-established laws which govern the natural*

*order.* Hence the impossibility is one that cannot be removed unless we pass out of the natural into the supernatural order. Then the impossibility vanishes; there is nothing in the order of things to prevent the higher law superseding the lower. The supernatural Providence of God acting in a supernatural way makes that to be possible which in the natural order is impossible.

There is a third sense, and the only one in which the word attains to its full and proper meaning. When I say that it is *impossible* that two and two could make five, or that there could be a triangle, in which two of the sides were together less than the third, I do not mean that it is so highly improbable as to be practically impossible; or that it is impossible unless the Author of the laws of nature choose personally to intervene and set them aside; I mean a great deal more than this. I mean that it is *impossible under all possible circumstances,* impossible to the Author of the laws of nature as well as to those who are subject to them. I mean that there is something in the nature of things, and therefore in the nature of God Himself, which forbids that mathematical laws should be reversed. Any other alternative would create a contradiction in God Himself. The law is a part or parcel of absolute Truth, and therefore is ultimately grounded on the very essence of the God of Truth.

Now this important distinction which I introduce here merely by way of illustration, escapes the notice of ordinary men because they are not in the habit of defining the words they use. Any one who

has realized the work of Definition and the importance of Definition, will at once ask himself: What is the meaning of *impossible?* He will break it up into the elements of which it is composed: he will discover it to be an event opposed to some universal law. Pondering within himself he will soon recognize that the first meaning I have attached to it, as indicating something so rare as in common parlance to deserve the name, does not properly belong to it at all; and that the second requires some explanation, inasmuch as a universal law may be suspended or annulled by the Maker of the law, and that it is only when it means something opposed to the nature of things that it has its strict, proper, and literal signification of that which cannot be.

But a definition, if it is to be of any use, must be exact. When it breaks up any complex idea into the simpler ideas that compose it, we must see that it does so according to a fixed rule. We must see that it consists of the *genus* or *material* part of the complete idea, and the *differentia* or its *formal* and distinguishing element. Our definition must, at least as far as this, make the idea of the object defined a *clear* one. We cannot expect absolute perfection in the clearness that is furnished by Definition. We cannot be said to attain to an absolute or perfect clearness unless we break up the complex idea into each and all of the simple ideas that compose it. We must not only be able to produce the proximate *genus* and *differentia*, but also to analyze each of these until we come to a *genus* that admits of no further analysis. If I define a *ligature* as a *bandage*

*used for tying up veins and arteries*, I give a correct definition. *Bandage* is the proximate *genus*, and the rest of the definition gives the distinguishing characteristic which marks off a ligature from all other bandages. But this is but the beginning of the process: the question that at once suggests itself is: What is the definition of *bandage?* I reflect a little and say that *Bandage is a strip of cloth or some similar material used for the binding up of wounds.* I have now got a step further, but I am a long way off from the complete analysis which is necessary to absolute clearness. I must be able to give a correct definition of *cloth*. After some little hesitation I pronounce it to be a *woven substance of which garments are made.* Now at last I am beginning to see daylight. If my interlocutor asks me to define *substance*, I have a right to send him about his business, and tell him that substance is a *summum genus*, and therefore incapable of definition. But he may still, if he chooses to be captious, exact of me an analysis of all the words that composed the definition, *i.e.* of *strip*, *wounds*, and *garments*. It is only when I have mounted up by a succession of steps to the *differentiâ* and the *summum genus* (which in each case will be substance) of each of these, that I can be said to have furnished a definition of *ligature*, which is *perfectly* clear and free from any possibility of obscurity or confusion.

In practice, however, this ultimate analysis is impossible, and to require it would be unnecessary and vexatious. I have done my duty, I have defined the object, when I have given the two constituents

of its essence, the *proximate genus* and the *differentia*. It may sometimes be necessary to go a step further, and define this proximate genus. But this is no part of my business as one called upon to define; it is a piece of superfluous generosity, for the sake of enabling my reader to form a clear conception of the meaning of the words I use. Thus if I define a *screw* as a *cylinder with a spiral groove on its outer or inner surface*, I must in pity go on to define a *cylinder*, or else my listener will in all probability be not one bit the wiser than before.

But we shall better understand the nature of Definition by laying down certain rules, the observance of which is necessary to a good definition. They are but an analysis of what Definition is: they do but declare in other words that all Definition must give the proximate genus of the thing defined, and the differentia which separates it from all other species coming under the genus. But at the same time they are decidedly useful as practical guides; and, moreover, without them we should be liable to employ words which should be excluded from a Definition. They also show the correctness of some definitions which we should at first sight be inclined to declare inadmissible, and without them the beginner would be exposed to errors in a process which is full of difficulties, and at the same time most important to correct thinking.

These rules are three in number.

Rule 1. *The Definition must be co-extensive with the thing defined*, that is, it must include neither more nor less, else it would not be a definition of

that which it undertakes to define, but of something else. This rule seems obvious enough, but like many things that are obvious, it is very easy to neglect it in practice and so fall into grave errors. Thus if we take the common definition of *wizard*, or *witch*, as *a person who has or is supposed to have dealings with the devil*, such a definition would be too wide, as there may be many persons who have some communication with the enemy of souls who are not in any sense wizards or witches. Or, if we take another definition found in some modern dictionaries, that a *witch* is *a person who has or is supposed to have supernatural or magical powers*, such a definition would again be far too extensive as it would include all those who work miracles by the power of God, or to whom such miracles are attributed. If, on the other hand, we define a *witch* as *one who exercises magical powers to the detriment of others*, this definition would be too narrow, as there may be persons possessed of such powers who exercise them for gain, and not with any sinister design on their fellow-creatures.

So, again, if I define *Logic* as *the art and science of reasoning*, I am limiting Logic to only one of the three operations of thought, I am excluding from it most unjustly all control over the formation of ideas and of judgments, and my definition is altogether too narrow. If, on the contrary, I define it as *the science or art which guides the mind to attain to a knowledge of truth*, I extend it altogether beyond its sphere. I make it include all other sciences whatever, for what is the aim and

object of every science save to lead man to the attainment of truth? Theology and mathematics, botany and metaphysics, astronomy and ethics, all set this end before themselves. Yet this definition, though so utterly incorrect, varies but a hair's breadth from the true Definition: *Logic is a science (or art) which guides the mind in its attainment of truth.*

It is often exceedingly difficult, or even impossible, to know whether our definition is co-extensive with the thing defined. The difficulty falls not so much on ascertaining the proximate genus, as on making sure that the differentia really differentiates this class from all others under the genus, and that it does not shut out some of the individuals who really belong to it. Take of all definitions the most familiar: *Man is a rational animal.* Let us suppose Gulliver's curious fiction to be true, and that in some of the planets there is a true Laputa inhabited by Houyhnhnms and Yahoos. What then becomes of our definition? The Houyhnhnm is a rational animal, but certainly not a man. We should have to add to the definition some further distinguishing mark to exclude the Houyhnhnm from our definition of man. Our justification of our present definition is that on this earth, at all events, there are not any other rational animals than man, and that the possession of reason distinguishes man from all around. Or to take a more practical case: If we define the *sun* as *a luminous body forming the centre of the material universe*, we cannot be absolutely certain of the correctness of our differ-

entia. It may be that the whole of our solar system is but a portion of some larger system, and that the sun is but a planet revolving round some more central body on which it is dependent. All then that we can do is to define up to the limits of our present knowledge and within the sphere familiar to us. If I define the *Pope* as *the Supreme Ruler of the Catholic Church on earth,* this would not interfere with my recognition of our Lord's Supremacy if He were to return and rule over His people, as the Millenarians believe He will, for a thousand years on earth.

Rule 2. *The Definition must be in itself clearer and more familiar than the thing defined.*

In this rule the words *in itself* are of great importance, for many a definition is to ordinary mortals more difficult and unintelligible than the thing defined by reason of their ignorance and want of cultivation *Man* is the thing defined. Every child understands the meaning of the word *man,* to whom *rational being* conveys no sort of meaning. Most people know what a screw is, but only an educated man would have a clearer notion of its nature after hearing the definition we have given above. Very few of us, though we may fancy ourselves versed in *art* and cognisant of its nature, will find ourselves much enlightened when we are informed that it is a *productive habit, acting in accordance with reason.* Yet if we ourselves were asked to define art, we should probably find ourselves utterly unable to do so. Our knowledge of its character is an utterly vague and indistinct one which we are unable to

analyze. How many there are who, if they are asked a question respecting the character of some object, answer by an enumeration of the classes or individuals of which it forms the genus or the species. If you ask a child what he means by an animal, he will answer: *Oh, dogs and horses, and that sort of thing.* Unable to break up the idea viewed as a metaphysical whole into its metaphysical parts, he will regard it as a logical whole and break it up into some of its logical parts. Instead of splitting up the idea into simpler ideas, he will separate the wider class into some of the narrower classes. He will regard it, not in its intension or comprehension, but in its extension; he will give you, not what it contains, but the area over which it is spread. He will look at it in the concrete, not in the abstract, and the process is so much simpler and easier that we cannot wonder at it.

But this will not do for the mental philosopher. He aims at correct thinking, and no one can think correctly without the habit of analysis, which is the road to correct Definition. At the same time it is enormously fostered by the effort which Definition involves, and by the exactness of mind that it produces. If I am to have sound views about art, I must know what is its object, and what are the conditions of success. The true definition of art here comes in to assist me wonderfully, and is necessary to determine whether logic, for instance, or political economy, is an art or a science, or both; and what is necessary to constitute the true artist; and a thousand other questions which mere vague

impressions will never enable me to answer correctly.

What, then, do we mean when we say that a definition must be *in itself* clearer and more familiar than the thing defined? It does not mean that the words employed are more familiar to us, but that the ideas they express are more simple than the idea of which they are the analysis. Thus if I define *circle* as *a plane figure, contained by a line, every point of which is equidistant from a fixed point within it*, the general impression left upon the ordinary mind by the definition is far more perplexing than that which is left by the thing defined. The words are more puzzling because less familiar in ordinary life. Yet the definition is nevertheless a perfectly correct one. It is in itself simpler and more familiar than the thing defined. Each of the words used expresses an idea less complex than the word circle. We cannot really fathom the nature of a circle until we have fathomed those various ideas of plane, figure, line, point, equidistant, &c. Without it our knowledge of a circle is vague and indefinite. They are its component parts, *plane-figure* is the *genus*, and *contained by a line*, &c., the *differentia*. There is less to think about in them—to each of them something has to be superadded in order to complete the idea of a circle.

Hence in framing a definition we must be very careful that the thing defined does not come into the definition concealed under some word or phrase which cannot be understood without a previous

knowledge of the nature of the thing to be defined. This rule would be broken if we were to define *man* as a *human being*, since the idea of *man* is involved in the idea of *human*, or if we defined *sun* as *the centre of the solar system*. The definition of *network* as a *system of cordage, reticulated or decussated between the points of intersection*, sins against this law, as the word *reticulated* includes the Latin equivalent for the word *net*. An amusing definition, said to have been given by Dr. Wilberforce, the Bishop of Oxford, to a Committee of the House of Commons, sitting on some Church question, is a good illustration of this kind of fault in defining. He was asked to define *Archdeacon*, and he wrote on a slip of paper the following ingenious answer: *An Archdeacon is an ecclesiastical dignitary, whose business it is to perform archidiaconal functions.*

This kind of Defective Definition often takes the form of what is called a *vicious circle;* that is to say we first define one idea by a combination of other ideas which is co-extensive with it, and then define one of these by the idea which was in the first instance to be defined. For instance, if we define a *sovereign* as *a gold coin equal in value to twenty shillings*, and when asked to define the value of a *shilling*, answer that it is *the twentieth part of a sovereign*, the circle is obvious enough. If we desire to know which of the two definitions is the faulty one, we have to ask ourselves what is the unit of monetary value, or approaches most nearly to it according to the ordinary agreement of men, and this will be the idea *simpler and more familiar in*

*itself*. Thus a penny is by common consent in small sums our English unit, as we see by our using it even in speaking of sums above a shilling, fifteen pence, eighteen pence, &c. In America, on the other hand, it is the dollar, and smaller sums are reckoned as a half, a quarter, and a dime. So again, if I define *a day* as *a period of time consisting of twenty-four hours*, and then *an hour* as *the twenty-fourth part of a day*, I commit the same fault. Here again we have to ask a similar question, and a little consideration will show us that here the unit is the day, and that the hour is a more complex and elaborate idea, that has to be defined by the portion of time that is marked out for us by the rising and the setting sun.

This rule is also transgressed if we define a term by a Synonym. To define *sin* as *iniquity* or as *trespass*, would be a violation of the law. Or to define *dyspepsia* as *indigestion*, or *oblivion* as *forgetfulness*, or *forgiveness* as *remission*, or *banquet* as *feast*, or *laundress* as *washerwoman*. These are not definitions, but translations for the most part of some word borrowed from another language, and often rather incorrect translations. It is rarely that one language has a word exactly corresponding to it in another. There is generally some delicate shade of difference. True synonyms are very seldom found, and to define by synonyms generally violates also the first rule of good definition, since the definition and the thing defined are scarcely ever perfectly co-extensive.

We also transgress this rule if we define by a

Negative: for instance, if we define *vice* as *the absence of virtue*, or *sickness* as *the absence of health*, or a *dwarf* as *one who has not the ordinary stature o a man*. We can never learn the true nature of a thing by any explanation of what it is not.

But what is to be done in the case of Negative ideas? Is not in this case Definition necessarily Negative? It would be, if they were capable of a definition, but a negative idea is not properly speaking an idea at all, it is merely the negation of an idea. It is a non-entity, something not existing, and therefore incapable of definition. All that we can do is to state that of which it is the negation, and thus we describe it according to the test of our definition. For instance, we explain *darkness* as *the absence of light*, or *weakness* as *the absence of strength*. We do not define in the strict and proper sense of the term, we simply give a description of what is of its own nature incapable of being defined.

A Negative Definition, however, is very useful in clearing the ground and guarding against confusion. When I am told in the pulpit that I should aim at *indifference* respecting all the events of my life, I am liable to mistake the preacher's meaning unless he clearly guards himself against the negative signification of *indifference*, which is the obvious one. He must explain what he does *not* mean before I can grasp what he does mean, and can see that it is a state of mind at which I am bound to aim. He must make me understand that he does not mean to recommend indifference in the sense of an absence of interest in things around me, or a sort

of sceptical carelessness respecting truth and falsehood, or a selfish disregard of the happiness of others.

Rule 3. *The Definition must be composed of words used in their strict and proper sense.*

This rule forbids the use of all metaphors, equivocations, ambiguities, obscure or far-fetched expressions in a definition.

(*a*) As we must avoid metaphors in a discussion, so we must avoid them most carefully in a definition, and this for the simple reason that exact definitions are an essential part of an exact discussion. Very often an ingenious disputant, if he finds that he is being worsted in an argument, will throw in some plausible metaphor under colour of making his meaning more evident. Thus a specious objection to exactness of detail in some dispute may be raised on the ground that such minute exactness is like the work of the pre-Raphaelite painter, who spoils the general effect of his picture by insisting that every leaf and every flower shall be given with the greatest precision. In the same way we hear diversity of opinion in matters of religion defended on the ground that in nature the diversities of shape and size and tint among the flowers and foliage combine into one harmonious whole, and are infinitely preferable to a monotonous uniformity. We shall have occasion when we come to speak of the fallacies to give other instances of the danger of treating metaphors as arguments. At present we give it as a reason for laying great stress on excluding them from definitions.

But what is a *metaphor?* It is the use of a word in a transferred sense, the transference being from the order to which it properly belongs to some other order. Thus, if I define *humility* as the *foundation of all virtue*, I am transferring to the moral order the word foundation which belongs to the material order, and is primarily applicable to a building. If I define a *lion* as *the king of beasts*, I am transferring the notion of royalty from rational to irrational creatures. The same sort of objection would hold to the following definitions: *The virtues are the stepping-stones to Heaven amid the eddies of passion and the whirlpools of temptation. Logic is the medicine of the mind. Friendship is the link which binds together two hearts into one. A wiseacre is one whose worst folly is a caricature of wisdom.*

It is not always easy to say whether a definition includes a metaphor or not. The instance I have just given is an illustration of this. The word *caricature*, though it primarily belongs to the material order and signifies a portrait in which the defects are grossly exaggerated, has nevertheless been adopted by common consent to express a corresponding meaning in the moral order.

(*b*) We must also avoid equivocations or ambiguities in a definition; that is, expressions which admit of two meanings different from each other. If I define a *Conservative* as *a politician who upholds the doubtful virtue of consistency*, the double meaning attaching to the word consistency—of which we have already spoken—is an objection to my definition. If I define *Liberality* as *the possession of the*

*true Catholic spirit*, the ambiguity of the word Catholic is likely to mislead. So the definition of *an Oxford Professor* or *Tutor* as *a University trainer* would be liable to misconception on account of the familiar use of trainer for one who regulates the diet and exercise of those who take part in athletic contests.

This is a flaw very easily overlooked in a definition where the two meanings of the word employed are very closely akin to one another. If I define *Moral Theology* as *the Science of Casuistry*, the definition would be misleading to those who include in the idea of casuistry something of a tendency to split hairs in questions of conscience. If I were to define the *human will* as *the faculty which is necessarily influenced by motives*, there would be a double ambiguity; first of all in the use of the word *motive*, which means sometimes a cause of action that compels, sometimes one that only suggests and urges; and also in the use of the words *necessarily influenced*, which may mean that the influence is always present or that it cannot be resisted when it is present.

(*c*) We must also avoid obscure or far-fetched expressions, as, for instance, the definition of *fine* as a *pecuniary mulct*, or of *a duck* as *a domesticated mallard*, or of *Logic* as *the art of systematized ratiocination*, or of *Philosophy* as *the science which renders subjectivity objective*, or of *Eloquence* as *the essential outcome of a combination of natural fluency and rhetorical cultivation.*

We must, then. employ words in ordinary use

in our own day and in our own country, words the meaning of which shall be generally intelligible to average men, words that will not confuse or perplex them, but simply make known to them the signification of the word that we are defining.

This rule, like all the rest, is included in the essential characteristics of a sound definition. If we give the proximate genus and the ultimate differentia, we cannot well give far-fetched or obscure words, since we have seen that the words expressing these are in themselves simpler and more familiar than the word which expresses the thing to be defined. So, again, it is impossible to define by Synonym, or to give a definition which is not co-extensive with the thing defined, as long as we remember the true character which a definition should bear. Yet these rules are always useful in helping us to guard against the different perils to which Definition is liable, and to put our finger at once on any defect that has crept in unawares.

## CHAPTER XI.

### ON DIVISION.

Division—Various kinds of Totality—Actual and Potential Whole—Definition and Division—Logical and Metaphysical Whole—Physical Division—Metaphysical Division—Moral and Verbal Division—Logical Division—Basis of Logical Division—First Rule of Division—Dichotomy—Dangers of Dichotomy—Second Rule of Division—Violations of this Rule—Third Rule of Division—Cross Division—Choice of Principle of Division—Fourth Rule of Division—Division *per saltum*—Disparate Division—Summary.

THE importance of Definition, as we have seen, can scarcely be exaggerated. It underlies all truth. It is the starting-point of all our knowledge. It unfolds the nature of the object of thought. It gives us in spoken language an analysis of that of which we are speaking. It is either *nominal*, which explains the meaning of the words we use, or *real*, which opens out the nature of the thing. Real Definition is of various kinds, of which Logic only recognizes such a definition as gives the *genus* and *differentia* of the thing to be defined. In order to define aright we must observe certain rules: our definition must be coextensive with the thing defined; it must be stated in clear and familiar words, and must avoid metaphors, ambiguities, archaisms, and far-fetched expressions.

From Definition we pass on to Division. Both the one and the other process is a breaking up of the whole into its parts, an analysis of the complex into the more simple. This they have in common; yet they are at the same time, as processes, diametrically opposed to each other. That which Definition regards as a *whole*, Division regards as the *part;* that which Division declares to be more complex, Definition from its opposite point of view declares to be more simple.

In order to understand this apparent anomaly, we must remind ourselves of the various kinds of *totality*, and the different senses in which we employ the words *whole* and *part.*

What do we mean by a *whole?* We mean that which possesses some sort of unity, but is nevertheless capable of division. But unity may be of various kinds: there is *actual* unity and *potential* unity, and actual unity may either be *physical* unity or *metaphysical* unity.

Unity is said to be *actual* when the whole is made up of parts actually united to one another. When they are things really joined together in the physical universe, we have what is called *physical* unity, and the whole so formed is said to be a *physical* whole. Thus the human body is a physical whole, of which the limbs are the physical parts. But when the whole consists of things which are distinct, not really, but only in the way in which we conceive of them, then the whole is called a *metaphysical* whole, and the parts are said to be *metaphysical* parts. It is also sometimes called a whole

of *comprehension*. Thus animal nature, or animality, is a metaphysical whole consisting of metaphysical parts, viz., life and sensation. We think of these as different from each other, but we cannot break animality up into them, and put them apart one from the other. They are not actually separable, we cannot divide the life of an animal from its capacity for sensation; we can separate the two in thought, but not in fact.

Unity is said to be *potential* when the parts of the whole are not actually united together, either in the physical world or in the world of thought, but are capable of being classed together on account of their being made after one pattern, realizations of the same ideal which is common to all. Thus all existing *animals* have nothing which really unites them together, but nevertheless they are united in so far as they copy one pattern and fulfil one and the same idea. The various members of the class do not, when all put together, constitute the Universal, but they are *contained under it*, inasmuch as it can be applied to each and all of them. This is why the Universal is called a *potential* whole: it is because it has a certain power or capacity which makes it applicable to each, and so comprises all the individuals in its power to embrace them all. The Universal is also sometimes called a *logical* whole, because it belongs to the logical order, the order of ideas, not of existing realities; or a whole of *extension*, because it is extended over all the individuals that come under it. It does not *consist* of the individuals as the parts that make it up, for it

is capable of continually receiving fresh additions without its nature being affected by them. It *comprises* them in the sense that it is capable of being applied to each and all of them, and to each fresh instance that presents itself; it can accommodate them all within its unlimited and illimitable circuit. *Animal*, as a logical whole, does not consist, properly speaking, of men, horses, lions, tigers, &c., but it comprises them all; it is in nowise affected in itself by the discovery of some animal unknown hitherto, and it can always find plenty of room for it within its extension without being itself changed.

To return to Definition and Division. The whole with which *Definition* deals is the *actual* whole, not the *physical*, but the *metaphysical*. It breaks up *man*, not into arms, legs, &c., for this would be physical separation, but into the various simpler ideas which constitute the complex idea of man. It takes that nature which constitutes him *man*, and analyzes it into its constituent elements. It breaks up the abstract idea of humanity into reason or rationality, which is the distinguishing mark that separates him off from all other beings, and animality, which is the possession common to him and the brutes. It states the results of its analysis when it says that *man is a rational animal.*

The metaphysical whole is thus divided into its metaphysical parts, the whole of comprehension into the parts that are comprehended in it, the complex idea with the simple ideas that make it up. There is an actual separation, but not a physical separation; we cannot *in fact* separate man's reason

from his animal nature, but a separation of the two ideas is possible. We can think of his reason away from his animality; we can conceive him just the same in every respect save in the absence of reason and all that flows from its possession. We can conceive him also as just the same in all that belongs to him as a rational being, and deprived only of his animal characteristics. But neither the one nor the other can exist apart. Take away man's reason, and some other forms or specifying principles must come in to determine his animality. Take away his animal nature, and his reason cannot stand alone, but requires some material object which it can determine and inform.

On the other hand, the whole with which Division deals in Logic is a *potential* whole. It breaks up a class into the various smaller classes which it comprises. It separates the *logical* whole into *logical* parts; it takes all the individuals that are ranged under one head, and have one common name by reason of their all copying the same pattern, and analyzes them into a number of smaller groups which contain fewer individuals, by reason of the pattern copied by the members of these smaller groups being of a more elaborate and more restricted character.

We are here speaking of Logical Division, and must bear in mind that the word Division, like Definition, admits of a number of different meanings. Definition itself is a kind of Division. Perhaps we shall clear up our notions on the subject if we enumerate the various possible kinds of Division, and so lead up to Logical Division properly so called.

1. Physical Division of a physical whole into its physical parts, as of a man into soul and body, or of water into oxygen and hydrogen, or of a tree into root, trunk, branches, leaves, and flowers. But these three instances reveal to us the fact that there are various kinds of Physical Division:

(*a*) Into the *essential* parts of which the thing divided is composed. What do we mean by the essential parts? We mean those that are so necessary to the whole that if one of them is taken away the nature of the whole is destroyed. Take away either man's soul or body, and he ceases at once to be man. Take away the oxygen or hydrogen, and water ceases to be water.

(*b*) Into the *integral* parts of which the thing divided is composed. What do we mean by the integral parts? Those which are a real portion of the whole, but are not so absolutely necessary that the nature of the whole is as a matter of course destroyed by the absence of one of them. A tree does not cease to be a tree because it has no flowers, or a human body to be human because one of the hands has been cut off.

But here we have another subdivision according as the integral parts are *homogeneous* or *heterogeneous*. Homogeneous parts are those which are of the same nature and are called by the same name, as the various drops of which a body of water is composed. Heterogeneous parts are those which are of a different nature and are variously called, *e.g.*, the different limbs of the human body, eyes, ears, hands, feet, &c.

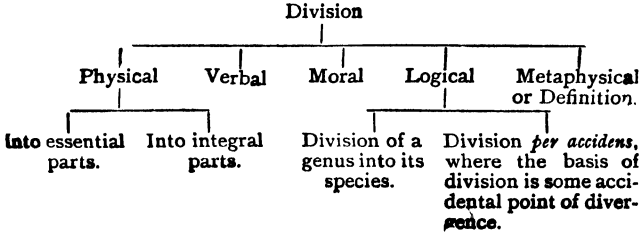
2. Metaphysical Division or Definition. Of this we have sufficiently spoken above. It is a true sort of division, though it differs from Physical Division or Logical Division. Yet inasmuch as it separates a whole into parts it has a true right to the name, even though those parts belong to the world of thought and not of external realities.

3. Moral Division, or the division of a moral whole into its moral parts. A *moral* whole is a multitude of living beings connected together by some relation to each other, as an army, or a family, or a swarm of bees, or a pack of hounds.

The moral parts of such a whole are either the individuals that compose it or certain smaller groups possessing a somewhat similar relation to each other. Thus in an army, the moral parts are either the individual soldiers, or the various regiments of which it is composed.

4. Verbal Division, or the division of an ambiguous term into its various significations.

5. Logical Division, or Division properly so called, in which the universal is broken up into the various smaller classes or individuals which are contained within its extent.



But we may break up the larger class into smaller classes, either by following the hard and fast divisions fixed by nature, or by framing principles of division for ourselves. Every species is divided off from all other species which come under the same genus, not by any arbitrary distinction invented by man for the purposes of his own convenience, but by fixed and definite boundaries belonging to the nature of things. The various species of animals, for instance, are the realization of various distinct types existing in the mind of God at the Creation. Each of these has its own essence, the essential characteristic without which it ceases to be what it is. We have already explained this,[1] and it is unnecessary to repeat our explanations here. Now if we divide on the basis of the lines of demarcation laid down by nature, we have Logical Division in the strict and proper sense, breaking up the genus into the various species which compose it. In this sense we divide animals into men, lions, tigers, bears, monkeys, and the various species that come under the genus animal. If, however, we select some arbitrary difference for ourselves, then we have a sort of accidental division useful for practical purposes, but not the Division which is the converse of Definition, and belongs itself to Logic as such. Such an accidental division would be of animals into long-lived and short-lived, carnivorous and graminivorous, hirsute and smooth, &c., where the point of distinction marks no radical difference of nature, but only in

[1] Pp. 183, 184

one or two isolated characteristics. We must now try and lay down the rules which constitute a sound Division, not only in the more exact and limited senses in which we are opposing the process of Division and that of Definition, but in every sense in which we employ the term.

Rule 1. *The dividing parts must together make up the whole of the thing divided, neither more nor less.*

This rule is one of those apparent truisms that in practice is neglected every day and every hour. To observe it faithfully is one of the most difficult things in the world. How can we ever be sure that we have exhausted every subordinate class that comes under the larger class that we are dividing? If we are asked to give the various descriptions of Church architecture prevalent in England before the Reformation, we answer: "Saxon, Norman, Early English, Decorated, Perpendicular," and such a division would be a fairly correct one. But there are churches in England that could scarcely be included under any of these divisions. The Flamboyant, that was imported from France in the fifteenth century, is distinct from any of the above, and our enumeration would not be complete without it. If I divide politicians into Conservatives and Liberals, I neglect the little knot of Anarchists. If I divide lamps into candle-lamps, oil-lamps, gas-lamps, and electric-lamps, I have still omitted spirit-lamps, among the means of illuminating and heating which I am reckoning up.

This danger can only be avoided by adopting a kind of Division that is tedious but always safe.

*Dichotomy* is a division by means of contradictories, and as long as I cling to it, and am careful that the positive dividing member is included under the class to be divided, I cannot err in my division.

Thus I am always safe in dividing fruit into pears and not-pears, or into ripe and not-ripe, or into edible and not-edible. There is, however, often some difficulty in discovering whether the dividing member is included under the class. Unless I am sure of this, my division will be a futile one. Moreover, Dichotomy has another disadvantage, that it often escapes the danger, only by covering our ignorance or uncertainty at a certain stage by negative and indefinite terms. I have to divide substances and I begin by dichotomizing them, *i.e.*, I separate them into two classes, material and non-material (or spiritual). Then, again, I divide material substances into living and not-living; by repeating the process I subdivide living into sensitive and non-sensitive. Now if I know that there are no non-sensitive material and living substances, save vegetables, my division will be a satisfactory one: but if I have to leave the indefinite term *non-sensitive*, there remains a weak point at the end of the process.

On the other hand a Division may easily err, in that one of the parts includes more than the thing divided. If I were to divide jewels into rubies, sapphires, amethysts, emeralds, diamonds, topazes, crystals, garnets, pearls, blood-stones, and agates, my division would include too much, since crystals is a name applicable to many stones that are not jewels, and the same may be said of blood-stones

and agates. Or if I divide Africans into cannibals and non-cannibals, either of these classes exceeds the class to be divided, since there are both cannibals and non-cannibals in other parts of the world besides Africa.

Yet in this last instance I might easily have avoided the danger by making my division of Africans, not into cannibals and non-cannibals, but into cannibal Africans and non-cannibal Africans. So again, if I divide Oxford men into Doctors, Masters, Bachelors, and Undergraduates, my division is a correct one if it is understood that I mean by Doctors, Doctors of Oxford, by Masters, Masters of Oxford, &c., and not of any other University. But if any one were to meet a D.D., and conclude from my division as given above that he must therefore be an Oxford man, ignoring Cambridge, Durham, London, &c., he would draw a very false inference. Of course, in such a case as this, the fact of Degrees being conferred by other Universities, is sufficiently obvious to render the mistake an imaginary one. But this is not always the case. If I divide quadrupeds into mammals and non-mammals, I have to reflect a moment before it occurs to me that there is a mammal biped, viz., man. If I accordingly re-cast my division, and substitute for quadrupeds animals living on the earth (as opposed to birds and fishes), and then out of this new class form the two exhaustive classes of mammal and non-mammal, I still am not quite clear of the wood. Is there no animal living in the water that gives suck to its young? Yes, the whale.

Hence I must change the terms of my division if I desire to be accurate. I must divide quadrupeds into mammal quadrupeds and non-mammal quadrupeds. But here a fresh difficulty arises. Are not all quadrupeds mammals? Are there any beasts of the earth that do not give suck to their young? If not, then our division is a futile one. Once again I have to reflect, and perhaps to rummage a little in natural history books as well, before I learn that hares and rabbits are not mammals, and that therefore my new division is an unassailable one.

This last doubt respecting the existence of a class of non-mammal quadrupeds, endangering, as it did, our division, leads us to the second rule.

Rule 2. *None of the dividing members must be equal in extent to the divided whole.*

When this rule is broken, the Division becomes null and void, for one of the classes contains no members. If I divide animals into sensitive and non-sensitive, I have one of these futile divisions; there is no such thing as a non-sensitive animal, for sensation is the distinguishing mark that separates off animals from vegetables. The amount of feeling may be so small as to be scarcely appreciable. The poor jelly-fish commemorated above,[1] through which my stick is barbarously thrust, suffers no tortures by which my conscience need be disturbed. The thousand animalculæ which are said to exist in every drop of river water that we drink, have no prolonged agony before the warmth of the human body or the action of the acids of the stomach put

[1] Pp. 68, 69.

an end to their feeble life. But, nevertheless, to the class of sensitive beings they all belong.

This Division of *animals* suggests an objection. It may be said that there are other *sensitive* beings besides animals. How about the *sensitive* plant? Do we not say, moreover, that certain chemicals used in photography are selected, because they render paper soaked in them exceedingly *sensitive* to the action of light? Hence it appears that our division would be assailable on another ground; that one of the dividing classes extends beyond the class divided.

The answer to this objection is clear enough, if we collect our thoughts and fall back on the assistance of Definition, which so often enables us to see our way out of difficulties. We must *define* sensitive, and then we shall find that in its strict and proper sense it is applicable to animals, and animals alone. Sensitive means capable of sensation, or susceptible of some sort of feeling. Our friend the sensitive plant is not so called because we attribute to it any kind of sensation, but because it presents similar phenomena to those presented by things capable of feeling; by means of some mechanical or organic process it simulates the appearance of sensation. Hence the word sensitive is in its case used in a derived and improper sense. So too the sensitive paper is so called because it is so delicate in its appreciation of the influence of light, that it resembles a living being whose senses or feelings are very keenly appreciative of any impressions made on them—another use of the word which

departs not a little from the strict and proper meaning.

This second rule is violated whenever we take either the *differentia* or any *property* or *inseparable accident* of the class to be divided as the principle of Division. Nothing but a *species* of any class that can be broken up into species, or an inseparable accident of a class admitting merely of accidental divisions, can be used for purposes of division. If I were to divide Saints into holy and not-holy, or into humble and not-humble, or into those in the grace of God and those not, or into those who have to suffer some trials and those who have to suffer no trials, I should in each case break this rule, for I should be trying to form a class which would involve contradiction by attributing to Saints properties directly or indirectly at variance with their sanctity. A Saint who was not holy would be a direct and immediate contradiction in terms, for sanctity and holiness are but different names for the same thing; a Saint who was not humble would be no Saint at all, and a Saint who was subject to no trials would lack an invariable accompaniment of true sanctity. In order to break up the class I must look for some quality sometimes but not always belonging to the Saints. I may divide Saints into Saints who have committed mortal sin in the past, and Saints who never lost their baptismal innocence, since the preservation of baptismal innocence is not an invariable accompaniment of sanctity. Or I may divide Saints into long-lived and short-lived; or into Saints who led

an active life and Saints who did not lead an active but a contemplative life; or into Saints who were Martyrs and Saints who were Confessors; or into men Saints and women Saints; or into Saints who worked miracles and Saints who worked no miracles. Other instances of a breach of this rule would be the division of dyspeptics into those who suffer from indigestion and those who do not, or philosophers into learned and unlearned.

Sometimes this rule appears to be broken when it really is not. A hermit or eremite means a man who lives in the desert, and if I divide hermits into hermits who live in the desert and hermits who do not live in the desert, I seem to be creating an imaginary class. But common usage has lost sight of the strict etymological meaning, and applies the name to all who live by themselves apart from the world. So a monk (*μόναχος*) means a solitary, yet I can rightly divide monks into solitaries and non-solitaries, since custom has altered the original meaning of the word. In the same way misers may be divided into those who live happy lives (if any such there be) and those who do not; and pens into those which are made of the feathers of birds and those which are not, without any breach of this rule, by reason of the change in the meaning of the word that custom has introduced.

Rule 3. *The various dividing classes must be exclusive of each other; no member of any class must be found in any other class.*

When this rule is broken, the Division is said to be a Cross-Division, and a cross-division is always

bad. Thus the division of newspapers into Catholic papers, Church of England papers, Conservative papers, Liberal papers, Radical papers, Democratic papers, Home Rule papers, would be a cross-division, for many a paper is to be found included under more than one of these divisions. Or if we divide monkeys into gorillas, apes, baboons, chimpanzees, marmozets, orang-outangs, long-haired monkeys, short-haired monkeys, Indian monkeys, African monkeys, it is clear that as many a baboon is also an African monkey, and some marmozets are long-haired, the division is a faulty one.

The defect against which this rule guards us may result either from one of the classes being entirely included in another, as for instance in the division of mankind into Europeans, Englishmen, Frenchmen, Asiatics, Hindoos, Africans, Americans, Australasians; or from one class overlapping the other, so to speak, so that it is not entirely included in it, yet it has some members in common with it, as in the division of poems into lyric, epic, heroic, elegiac, tragic and comic, sonnets, odes, and hymns.

The secret of a good observance of this rule consists in the choice of what is called a fixed Principle of Division. I must form my different classes not at hap-hazard, or looking first to one aspect, then to another, of the nature of the individuals, but to one and the same aspect of all. Almost every class admits of being divided in several different ways, according to the view taken of it. If a book-collector has to break up the class of books, he will

do so on quite a different principle from the bookseller. The ordinary reader, or the man who is desirous to fill his shelves with handsome volumes, or the moral critic, will each of them naturally have his own basis of division. The collector will divide them into rare and common, and the rare books he will divide according to the class of literature in which he is interested. If he is a philosopher, rare books will fall in his mind into the classes philosophical and non-philosophical, for it is the former alone that will interest him. If he is an historian, they will be for him historical and non-historical; if a poet, or a classical scholar, or an Orientalist, he will divide them according to his own special taste and pursuit. The bookseller will take an altogether different view; for him books will fall into the classes of books that can be sold at a profit, and books that cannot be sold at a profit. The man who has to fill his library with a view to appearances, will divide them into books with handsome backs and books which are not well-looking, bound books and unbound books, into folios, octavos, duodecimos, &c. The moral critic will take quite a different Principle of Division; to him price, appearance, size, &c., are of no import, his duty is to parcel all books off into those with a wholesome, and those with an unwholesome moral tendency, those that he can sanction and recommend and those that he is bound to condemn. Lastly, the general reader will regard books under a general aspect, for him the important consideration will be whether they interest him or not, or

serve the purpose which he has in view, and his Division will be into interesting and not-interesting, or into useful and not-useful.

Rule 4. *We should always divide a class into its* proximate *or* immediate *classes, that is, into those which on the Principle of Division which may be assumed, follow at once upon it without any intermediate classes.*

This Rule is sometimes expressed by the phrase: *Divisio ne fiat per saltum.* In dividing we must not make jumps. It is not one the breach of which vitiates essentially a Division, it only impairs its excellence and renders it less practically serviceable. For instance, I have to divide the members of a regiment into smaller classes. If I begin by dividing them into colonels, majors, captains, lieutenants, ensigns, serjeants, corporals, lance-corporals, and private soldiers, I am somehow conscious that I am going too far at once. I shall do far more wisely if I first of all divide into the immediate divisions of a regiment, viz., commissioned officers, non-commissioned officers, and privates, and then make a further subdivision, if necessary, of commissioned officers into colonels, majors, captains, lieutenants, and ensigns, and of non-commissioned officers into serjeants, corporals, and lance-corporals.

This rule is more distinctly violated, if our Division is a *disparate* one, *i.e.*, if one of the classes into which we divide is an immediate and proximate class, while others are mediate and remote. The division of triangles into spherical, right-angled, acute-angled and obtuse-angled would be a breach

of this rule, since corresponding to the proximate class of spherical the other member should be the proximate class of rectangular, which ought by a subsequent Division to be split up into the subdivisions determined by the character of its angles. If we divide animals into birds, beasts, dog-fish, fresh-water fish, and salt-water fish, we shall be breaking this rule. If we divide inhabitants of the United Kingdom into dwellers in England, Wales, and Scotland, Ulster, Munster, Connaught, and Leinster, such a Division, though it cannot be said necessarily to involve any positive error, nevertheless leads to confusion of thought, and is likely to mislead us altogether.

Our chapter on so important and practical a subject as Division, must not be concluded without summing up its contents. We began by explaining that there are various kinds of Unity, *actual* unity (subdivided into *physical* and *metaphysical*) and *potential* unity. Corresponding to these is the *metaphysical* whole, or whole of *comprehension*, which Definition breaks up into its metaphysical parts, and the *potential* or *logical* whole, or whole of *extension*, which Division breaks up into logical parts. We are not in Logic concerned with the physical whole any more than with the moral and verbal, but simply with the metaphysical and logical. Division as an analysis of the logical whole is subject to four laws which control it:

1. The dividing parts must together make up the divided whole, neither more nor less. This is ensured by dichotomy.

2. None of the dividing parts taken separately must be equal to the divided whole.

3. There must be no cross-division, but the two dividing parts must exclude one another.

4. We must descend to the proximate classes when we divide, and not make jumps.

# LOGIC.

## PART II.

### OF JUDGMENT OR ASSENT.

## CHAPTER I.

### JUDGMENTS.

Judgment—Meaning of the word—Definition of the word—Three steps in Judgment—Various names of Judgment—Prudent and Imprudent Judgments—Convictions and Opinions—Hypothesis and Certainty—Immediate and Mediate Judgments—*A Priori* and *A Posteriori* Judgments—Test of *A Priori* Judgments—Analytical and Synthetical Judgments.

THE three parts of Logic correspond, as we have already remarked,[1] to the three operations of Thought. In the first part we have been considering Simple Apprehension, which engenders the Idea or concept, and expresses itself externally in the *Term*. We now proceed to the consideration of *Judgment*, the second operation of Thought.

Judgment (*judicium*, *ἀπόφανσις*) engenders the mental declaration of judgment or declarative expression (*λόγος ἀποφαντικὸς*) expressing itself

[1] P. 93.

externally in the *Proposition* (*πρότασις, enuntiatio*, or *effatum*). It derives its name from the fact that in the second operation of thought the mind sits like a judge upon its judgment-seat, and passes sentence respecting the agreement or disagreement of two objects of thought, affirming or denying one or the other. We mentally place two things present to our thoughts, one by the side of the other, and after comparing them together, we pass sentence respecting them. If we find them coincide one with the other, or if our attention is fixed in some point or points of agreement, we unite them together in the sentence that we pass; as, *Tigers are savage animals; Some negroes are thick-lipped.* If we find them at variance, or if our attention is fixed on some point of disagreement, we separate them in our judgments, as: *Turtle-doves are not savage; Some negroes are not thick-lipped.*

Here we notice:

1. That the word Judgment (like the Greek *ἀπόφανσις*, and the Latin *judicium*) is a double word; (*a*) for the act of passing sentence; (*b*) for the sentence passed. This is not a mere clumsiness of language, but expresses an important fact of psychology, which, however, it would be untimely to discuss here.

2. That when we compare two objects of thought together, it does not follow of necessity that we pass sentence or form a judgment. We may suspend our judgment, and if we are prudent men, we shall invariably do so, unless we have good grounds for arriving at a decision. Thus I compare together

Kamschatkans and honest. I have never known a Kamschatkan in my life, and cannot venture on any assertion of their honesty, nor, on the other hand, have I any reason to think they are dishonest. Accordingly I suspend my judgment, and refuse to make any statement at all respecting the coincidence or dissidence of the two ideas.

3. That when we form a Judgment it may be a tentative and uncertain and provisional judgment, or it may be a firm and unwavering one. Thus I compare together Dutchmen and intelligent. I have known half a dozen Dutchmen, and all of them have been remarkably intelligent; but at the same time my half-dozen may have been exceptional in their intelligence, and therefore when I lay down the proposition, *Dutchmen are intelligent*, I do it with some hesitation, and under the implied condition that I will not maintain it, if further experience reverses my belief in the intelligence of Dutchmen.

Judgment may be defined as *a mental act in which something is asserted and denied*, or a mental act in which one object of thought is pronounced to be identical with or different from some other object of thought. It includes three steps or stages.

First stage. The two objects of thought must be separately apprehended. We cannot pass sentence on things unknown to us. The first operation of thought must therefore invariably precede the second. We do not mean that there need be any interval between the Simple Apprehension and Judgment—one flash of thought may include them both—but there must at least be a

precedence of order and of nature, if not of time. Thus before I can form any judgment respecting the agreement or disagreement of sophistry and philosophy, before I can assert or deny that sophists are philosophers, I must clearly apprehend what is the meaning of the several terms that I am employing; what is the nature of the sophist and philosopher respectively.

Second stage. The two objects of thought thus apprehended must be compared together. We cannot pass sentence without a trial; the judge must examine the parties to the suit before the decision is arrived at. I must not only know what a sophist is, and what a philosopher is, before I can assert or deny that sophists are philosophers, but I must also put them side by side and look at each in the light of the other, just like a carpenter who puts his two pieces of wood side by side before he unites them together.

Third stage. We are not arrived at the final stage of our judgment. After examining the nature of the two objects and comparing them together, we still have something further to do; our comparison must eventuate in a perception of the agreement or disagreement of the objects compared, before that agreement or disagreement is laid down as a fact by a positive act of the mind. The end we set before ourselves in making the comparison was the recognition of this relation between them, and must precede in the order of nature any assertion respecting their mutual attitude to one another.

Why do I say *in the order of nature?* Because in the order of time the recognition of agreement

and disagreement is simultaneous with the actual judgment. Whether the two are one and the same act, or whether they can be distinguished from each other, is a point much disputed by philosophers It seems most likely that there is a distinction between them: the recognition of the agreement or disagreement has reference rather to the *necessity* of the two objects of thought being united or disunited, the judgment passed to the *fact* that they *are* united. But since any two objects of thought, the union of which can be said to be necessary, always are united, the question is one suited rather to employ the subtle versatility of the practised disputant than to occupy the mind of the student of Logic. We may, therefore, pass it over without further notice.

Judgment has various synonyms, representing its different aspects. It is sometimes called Composition and Division (σύνθεσις καὶ διαίρεσις) because it either puts together (*componit*) or separates from each other (*dividit*) the ideas compared. If I place side by side, as two objects of thought, chocolate-creams and sweetmeats dear to the soul of youth, and after due reflection perceive an agreement between these two ideas, I *compound* or *put together* the delicacies in question and the favourite confections of the young. If after comparing together the moon and that which is manufactured from green cheese, I pass sentence that the moon is *not* made of green cheese, I *divide* off the orb of night from all substances which have green cheese for the basis of their composition.

Sometimes it is called Assent (*assensus or adhaesio*) inasmuch as the mind gives its adherence to the verdict passed. I apprehend the idea of *earwig* and the idea of *nasty insect*, and the result of my comparison is a strong assent, a firm adherence to the objectionable character of that harmless, but repulsive little creature.

Sometimes it has the name Assertion or Denial (*affirmatio* or *negatio*), inasmuch as it asserts or denies one thing of another. Thus if I am a prudent man I shall assert the undesirable character of roast pork for the ordinary supper of men of average powers of digestion in the judgment: *Roast pork eaten at night is unwholesome;* or I may put the same assertion in the form of a denial by saying: *Roast pork eaten at night is not wholesome.*

DIVISIONS OF JUDGMENT.—Judgments are divided either (1) according to the state of mind of the person who frames the judgment, or (2) according to the nature of the judgment in itself.

1. In the former case the division is said to be *ex parte subjecti*, on the side of the subject or party whose mind undergoes the operation of forming a judgment; in the latter *ex parte objecti*, on the side of the object of thought, or that to which his thoughts are directed. Under the first head they are divided into *prudent* or *well-advised* when they are the result of careful and deliberate thought, and *rash* or *imprudent* or *ill-advised* when they are arrived at after insufficient inquiry or under the impulse of prejudice or passion. This division is not one

that comes, strictly speaking, under Formal Logic; but we have already said that we must from time to time, in the cause of truth, stop outside our proper domain, and watch for error that may creep in unawares into the mind of man.

For instance, two men set to work to inquire into the truth of *miracles*. One of them studies theological treatises respecting their nature, converses with those who uphold as well as those who deny their reality, visits the spots which are renowned for miracles, reads carefully the medical testimonies respecting the sudden cures worked there, studies the lives of the saints, inquires into the moral and religious character of the most celebrated thaumaturgi, weighs the evidence for the Gospel miracles, and (we suppose him a theist) begs God for light that he may arrive at a true conclusion. If such a man, after his careful inquiry, arrives at the conclusion that miracles are undoubted facts, no one can deny to his judgment the character of prudence. The other man refuses to study the details of alleged miracles, declares them beforehand to be the result of a fervent imagination or a deliberate imposture, challenges the believer in miracles to show him one before his own eyes, and if he sees one, or has evidence brought before him which he cannot gainsay, attributes it to some yet undiscovered power of nature. When he passes sentence, as such a one certainly will, that miracles are impossible and absurd, we shall be right in calling this his judgment rash and wanting in prudence.

What amount of investigation is necessary in order that the judgment which results from it should deserve the name of prudent, must depend on the importance of the matter in question. Here it is impossible to lay down any law; the only rule that can be laid down is that such an amount of inquiry should be made as would be regarded as sufficient by intelligent men conversant with the matter in question. Nor is it possible to lay down any laws for the elimination of antecedent prejudice, since prejudice is, in a majority of cases, a disease of the will rather than of the intellect, and, therefore, lies altogether out of the scope of the logician.

Judgments may also be divided in regard of the person who forms them into certain judgments or *convictions* and uncertain judgments or *opinions*. The former exclude all dread of the opposite being true, and the state of mind that results from them is *certitude;* the latter do not exclude all dread of the opposite being true, and the state of mind they produce is *hesitating assent* or *hypothesis*, or *supposition*. To the former the mind clings absolutely, to the latter only provisionally until further light is obtained.

One of the chief sources of human error is the tendency of mankind to exalt opinions into convictions, to regard as certain what is still uncertain, to jump at conclusions where there is no warranty for doing so. A man obtains a partial knowledge of the facts of the case, and from those facts constructs an hypothesis; additional facts come to his knowledge which happen to fit in with his hypothesis; under

the influence of these he unduly expresses his hypothesis as an established law, manages to close his eyes to all facts that militate against it, and proclaims to the world as axiomatic what is at best but a brilliant guess, which may be true, and may also be false.

In all scientific investigation this stage of *hypothesis* must precede certainty, and these brilliant guesses are often the precursors of most important and valuable discoveries, but it is a fatal mistake to regard as certain what is still uncertain, and to assume the truth of an induction which has not been sufficiently tested. Thus Evolution is still an hypothesis, not a scientific law, and the man who calls himself an Evolutionist should remember this when his law comes into conflict with the statement of the theologian. The conclusions arrived at by Lyell and other geologists respecting the age of the world are but hypotheses, many of which have already been overthrown by subsequent discovery. For a long time the motion of the earth round the sun was in the stage of hypothesis. It was a brilliant guess, a scientific opinion which could not show sufficient grounds for its acceptance, in opposition to what were supposed to be the counter-statements of Holy Scripture. In the time of Galileo it was not clearly established, and though his genius, overleaping the ordinary laws of investigation, may have instinctively recognized its truth, and justified him in holding it as a private opinion, yet the verdict of the Roman Congregation was in accordance with the scientific theories of the day. Galileo could bring forward no

proof sufficient to convince them that he was right and they were wrong. If he had stated his discovery with due modesty, merely as an hypothesis, and professing all submission to lawful authority and readiness to withdraw all that he could not prove, the unfortunate conflict would never have arisen and given the enemies of the Church a plausible ground for their attacks on the alleged narrowness of the theological mind.

2. Judgments are also divided in various ways in regard of the objects of thought which are compared together, without any reference to the state of mind of the person comparing them. Under this aspect they are divided into *immediate* judgments and *mediate* judgments.

An *immediate* judgment is one in which the agreement or disagreement of the objects compared may be recognized at once from a knowledge of their nature, or from experience. If from a knowledge of their nature, we have an *immediate analytic* judgment, if from *experience*, an *immediate synthetic* judgment. A *mediate* judgment is one in which the agreement or disagreement of the subject and predicate can only be recognized by a process of reasoning.

Thus, if I compare together circle and round as the two objects of my thought, I at once and immediately perceive their agreement from the very nature of the case, or if I compare together angel and incorporeal, and therefore the judgments, *Circles are round*, and *Angels have no bodies*, are immediate judgments.

But, if I compare together the human body and

mortal, I have to go through a process of reasoning before I can ascertain whether these two objects of thought agree or disagree. I have to say to myself:

*The human body is material.*
*All material things are corruptible.*
*All corruptible things are liable to decay.*
*All things liable to decay are mortal.*
∴ *The human body is mortal.*

Here I only ascertain the mortality of the human body, through the medium of other objects of thought, viz., material, corruptible, liable to decay; and my judgment is therefore mediate.

Judgments are also divided into judgments *a priori*, and judgments *a posteriori*. We have already spoken of these incidentally, but we must again discuss them here in their proper place.

An *a priori* judgment is one in which the predicate is included in or united to the very idea of the subject, and is deducible from it, so that from the very nature of things they agree together, and any one who has a comprehensive knowledge of the subject, perceives immediately that the predicate is a part of it, or is necessarily connected with it, as *The whole is greater than a part; God is omnipotent.* Similarly an *a priori* negative judgment is one in which the predicate is excluded or disunited from the very idea of the subject, so that from the very nature of things they disagree from each other, and any one who has a thorough knowledge of the subject, perceives that the predicate is not a part of it, and is necessarily disconnected with it, as *Circles are not square; Honest men are not thieves.*

On the other hand, an *a posteriori* judgment is one in which the predicate is not necessarily included in or united to the idea of the subject, but may or may not be connected with it, so that they do not agree from the nature of things, but only because we learn by experience and from the facts of the case that they agree; as, *Houses are built of brick or stone; Swans are white; Foxes are cunning; Gold is a precious metal; Telephones are a recent invention.* Similarly an *a posteriori* negative judgment is one in which the predicate is not necessarily excluded or disunited from the idea of the subject, but may or may not be separated from it, so that they do not disagree from the nature of things, but only because experience and a knowledge of external facts teaches us that they disagree, as *Wolves are not found wild in England; Dyspepsia is not a pleasant malady.*

*A priori* judgments are also called *necessary*, because they declare the necessary agreement of subject and predicate; *analytical* because an analysis of the subject at once shows that the predicate belongs to it; *metaphysical* because metaphysics deals with the inner nature of things.

*A posteriori* judgments are also called *contingent* because it may or may not happen (*contingere*) that the subject or predicate agree; *synthetical* because they are not arrived at from an analysis of the subject, but from putting together (*συνθεῖναι*) a number of observed facts; *empirical* because they are learned by experience (*ἐμπειρία*); *physical* because physics deals with the external nature of things.

Hence there are three requisites for an *a priori* judgment:

1. The predicate must be included in or derivable from the idea of the subject.
2. It must have the character of necessity.
3. It must be universal.

The absence of any one of these conditions will destroy its *a priori* or analytical character. We will examine one or two judgments, and see to which of these two classes they belong.

Let us take the Proposition of Euclid: *All triangles have the exterior angle greater than either of the interior and opposite angles.* In this judgment the subject is *triangles*, the predicate *having the exterior angle greater than either of the interior and opposite angles.* Does an analysis of the notion of a triangle contain all this long rigmarole? Scarcely. I might have a general knowledge of all the characteristics of a triangle without recognizing this fact. But from the notion of triangle it is derivable. I am supposed already to understand the meaning of terms, and that exterior angle means the angle made by producing one of the sides with the side adjacent to it. When I have produced the side, I perceive that from the very idea of triangle there is deducible this property of having an exterior angle greater than either of the interior and opposite angles. This judgment is *necessary*. Step by step I prove it by irrefragable argument from first principles. It is *universal;* no triangle in the world can be otherwise. Yet this necessity is not self-evident or immediate. Probably many an intelligent school

boy has covered his paper with triangles in which he has vainly hoped that one may be found, in which the exterior angle is equal to or less than one of the interior and opposite angles. All in vain! The law admits of no exception. To all eternity no such triangle will be found. Not in the moon, not in Sirius, not in any of the stars which make up the Milky Way. Not in the mind of God Himself, to whom it would be impossible, in spite of His omnipotence, to make a triangle by the utmost exercise of His Divine power, in which the exterior angle should be either equal to or less than one of the interior and opposite angles.

Let us take another proposition: *Jews are fond of money*. Is this an *a priori* proposition? According to some, the very word *Jew* implies the money-loving temper, but this is not the proper meaning of the word. Is the fondness for money *universal?* It may be so, but this would not of itself make the proposition an *a priori* or analytical one. Does the analysis of *Jew* furnish the idea of *fond of money?* Certainly not. What is there in the idea of being descended from the chosen people of God that involves the idea of a sordid desire for riches? Is it a *necessary* proposition? Again we answer, No. There is no necessity in the reason of things why there should not be members of the race (and such there are) who are absolutely indifferent to sordid gain. The proposition is an *a posteriori* and empirical one, which may be true and may be false. It is arrived at from experience; it may sometimes

be the case and sometimes not; it is essentially an *a posteriori* proposition.

This distinction, clearly marked as it is, cannot always be applied at first sight to particular cases. We may sometimes find it very hard to discover whether any given judgment is an *a posteriori* or an *a priori* one. Take, for instance, the judgment, *All negroes are black.* To which head is this to be assigned? On the one hand, it may be said that blackness is of the essence of the negro race, and that it is this which distinguishes them from white men. On the other hand, what are we to say about albinoes?

The real test of this and similar propositions is whether, in the notion of the subject as understood by educated and well-informed men, there is included the predicate. If so, the proposition is an *a priori* or analytical one; if not, it is *a posteriori.* In the instance just given, there is no question that the generally entertained idea of *negro* includes blackness. Albinoes are a *lusus naturæ.* It is doubtful whether they can be called negroes even in an improper sense. The very expression, *A white negro,* is just as much a contradiction in terms as *An irrational man.* But just as madmen or idiots are no bar to the *a priori* character of the judgment that men are rational, so neither are albinoes to that of the judgment: *All negroes are black.*

But if we examine by the common-sense test the proposition: *Lions are fierce animals,* we shall find it gives very different results. The judgment is

generally true, but not necessarily, or indeed universally. The idea of a lion does not include that of fierceness. If we found a race of lions gentle and even cowardly (such a race is said to exist in Asia, I know not where), we should regard them as lions just the same. *Cowardly lion* does not jar upon our intellect like *white negro*. We are well aware that most lions are fierce and brave, but we are quite ready to find that there are plenty of exceptions.

We have already discussed Kant's theory of the existence of *a priori* propositions that are not analytical, and we need not add anything here in refutation of *a priori* synthetical propositions. His theory arose from an imperfect analysis, and was an easy way out of the difficulty of reducing them in some cases to the laws by which all thought is regulated. It is rejected by the best modern logicians,[1] and is one of those fond inventions by which men imagine that they have improved on scholastic principles, not perceiving that they would thus improve off the face of the earth the solid foundations on which alone true philosophy can rest unshaken.

[1] Cf. Zigliara, *Logica*, pp. 84, 85, who says: "Impossibile igitur est concedere universalitatem et necessitatem prædicati in aliquo subjecto, et negare hujusmodi prædicatum includi in ipsa ratione subjecti; consequenter judicia synthetica-a-priori, quæ habent, fatente Kantio, priores conditiones, habent a fortiori et alteram de inclusione prædicati in notione subjecti; ac proinde illa judicia revera sunt analytica absolute et a priori."

## CHAPTER II.

### ON PROPOSITIONS, THEIR NATURE AND DIVISIONS.

What is a Proposition—Parts of a Proposition—Ambiguity of word Predicate—Analysis of Propositions—Divisions of Propositions—Necessary and Contingent Propositions—Affirmative and Negative Propositions—True and False Propositions—Truth and Falsity in Logic—Logic as a test of Truth—Quantity of Propositions—Singular Propositions—Indefinite Propositions—Distribution of the Predicate—Rules of Distribution.

WE have already said that Logic is concerned primarily with thought, and with language in so far as it is necessary for the expression of thought. The first part of Logic dealt with *Terms*, inasmuch as they are the external rendering of the ideas which are the result of the first operation of thought. In the same way the second part of Logic deals with *Propositions* as being the external rendering of the judgments which the mind forms in the second operation of thought. Hence a *Proposition* is nothing else than *a judgment expressed in words or other external signs*. Not necessarily in words, for we may state a proposition by a word or a shake of the head. If a father asks his little girl whether the cat has had her breakfast, and the child nods her head by way of reply, she enunciates the affirmative proposition, "The cat has breakfasted," just

as clearly as if she said yes, or repeated the words. But in general we may say that language is the natural expression of thought, and therefore in general the Proposition is a Judgment expressed in words.

We may now define a Proposition:

A *Proposition* (*πρότασις, ἀπόφανσις, enuntiatio, propositio, predicatio, effatum*) is an expression which affirms or denies something of something else (*oratio affirmans vel negans aliquid de aliquo*), or a form of words which states one thing of another (*oratio enuntiativa unius de alio*).

A Proposition consists of three parts or elements: the *Subject, Predicate* and *Copula*. The *Subject* (*ὑποκείμενον, subjectum*) of a Proposition is that of which something else is stated.

The *Predicate* (*κατηγορούμενον, praedicatum*) of a Proposition is that which is stated of something else.

The *Copula* (*προσκατηγορούμενον, appraedicatum*) of a Proposition is the link uniting (*is, are*) or separating (*is not, are not*) the subject and the predicate.

Thus in the proposition: *Rattlesnakes are poisonous, Rattlesnakes* is the subject of which it is stated that they are poisonous, *poisonous* is the predicate which is stated of Rattlesnakes, and *are* is the copula uniting them. In the proposition: *Sceptics are not true philosophers, sceptics* is the subject, *true philosophers* the predicate, and *are not* the disuniting copula. The subject and predicate, inasmuch as they occupy the extremities or the beginning and end of the proposition, are called the *Terms* (*ὅροι, ἄκρα, termini*) of the Proposition. Simi-

larly in the proposition, *Old men are fond of talking*, the subject is *old men*, and the predicate *fond of talking*. In the proposition: *The unparalleled audacity of his conduct is sufficient to cause all honest men to shun his company*, the subject is *the unparalleled audacity of his conduct;* the predicate, *sufficient to cause all honest men to shun his company*. Hence it is clear that subject and predicate may consist of many words so long as these words are expressive only of one idea.

Here the reader must be warned of a certain ambiguity in the word *predicate*. In grammar, predicate is used in a different sense from that which it bears in logic, and includes the copula as well. In the proposition, *Idleness demoralizes*, the grammarians would call *demoralizes* the predicate; in the proposition, *Dogs bark*, *bark* would be the predicate in the grammarians' use of the word. This terminology was also that of Aristotle and the earlier logicians. They broke up the proposition into the *ὄνομα*, or the subject, and the *ῥῆμα*, or the predicate. The change in the terminology of logicians is post-Aristotelian, and is suggested by a passage in his treatise *De Interpretatione*, 10. 4, in which he says that the verb is sometimes added to the subject and predicate as a third element in the proposition.[1]

[1] *ὅταν δὲ τὸ τρίτον ἔστι προσκατηγορῆται, ἤδη διχῶς λέγονται αἱ ἀντιθέσεις. λέγω δὲ, οἷον ἔστι δίκαιος ἄνθρωπος.* From this expression subsequent logicians drew the term *προτάσεις ἐκ δευτέρου προσκατηγορουμένου*, or *propositiones secundi adjacentis*, where the copula forms one word with the predicate, as *Trees grow;* and *προτάσεις ἐκ τρίτου προσκατηγορουμένου*, or *propositiones tertii adjacentis*, as *Trees are growing*.

A Proposition may consist of any number of words from one to a thousand, but it must always be capable of being resolved into three terms, viz., subject, predicate, and copula, *e.g.*, *loquitur*, *he speaks*, *he is speaking*, where *he* is the subject, *speaking* the predicate, and *is* the copula. *Troja fuit—Troy is a city of the past; Adversantur—They are opponents.*

In order to break up a Proposition we have only to ask ourselves, 1. What is it of which we are speaking? and the answer to this question will give us the subject of the proposition. 2. What is it that we affirm or deny of it? and the answer will be the predicate; while the copula is always some person singular or plural of the verb *to be* with or without the negative. Thus in the proposition, *Horses neigh*, that of which we are speaking is *Horses:* that which we say of them is *that they are creatures that neigh*, and our proposition in logical form will be, *Horses are neighing creatures.* In the proposition, *Misers are not generous*, *Misers* is the subject, *generous* the predicate, *are not* the separating copula.

It is not very easy in some cases to distinguish the various elements in a complicated statement into subject, copula, and predicate. The beginner is prone to mistake the object of the verb for the predicate, and if asked to give the predicate of the sentence, *Architects build houses*, to imagine that *houses* is the predicate, instead of *builders of houses.* There is also the further difficulty of distinguishing the use of the present tense of *to be*

as copula from its use as indicating existence. In the proposition, *A million years ago the world was not, was not* means *did not exist,* and the predicate will be, *an object that had no existence.* Besides this we have to remember that the present tense of *to be* is alone available as the copula. Thus, *Cæsar was a skilful general*=Cæsar is a man who was skilful as a general. *The sun will be burnt out some day*=The sun is a fire that some day will be burnt out.

A more serious difficulty arises from the frequent transposition of sentences. Thus in the sentence, *Many are called but few are chosen,* there are two propositions of which the respective subjects are *those called,* and *those chosen,* while the predicates are *many* and *few.* In some cases it is impossible to decide without the context, which is the subject and which the predicate, as in the sentence: *A very young man was the judge in this important suit.* In such cases, we have to discover the predicate by asking ourselves which is the emphatic word in the sentence. If great stress is laid on the extreme youth of the judge, then *a very young man* will be the predicate; but if the fact of his youth is mentioned as a fact only of secondary importance, then *the man who was judge in this important case* is the predicate. In the proposition, *I read your letter with very great sorrow indeed,* the emphasis falls on the concluding words. The logical order will be: *The feeling I experienced when I read your letter is a feeling of very great sorrow.* In the proposition, *Most men eat flesh meat, most* is emphatic, and the logical

order will be: *The eaters of flesh meat are a majority of mankind.*

DIVISIONS OF PROPOSITIONS.—Every Proposition has a *material* and a *formal* element. The *material* element or matter of a Proposition is the *subject* and *predicate*, for they are the material out of which the Proposition is made.

The *formal* element of the Proposition is the *copula*, since it gives it its form and shape, and determines its quality, both its essential quality, whether it is *affirmative* or *negative*, and its accidental quality, whether it is *true* or *false*. Hence we have three different Divisions of Propositions.

I. According to their *matter* (that is, according to the relation existing in fact between the subject and predicate), they are divided into four classes.

(*a*) When the subject and predicate are by the very nature of the case united together, the proposition is said to be in *necessary* matter, as, *A straight line is the shortest distance between any two points*, or, *God exists.*

(*b*) When the subject and predicate are in point of fact united together, but their union is not of the nature of things, but is a fact that we could conceive otherwise, they are said to be in *contingent* matter, as, *Cats have a strong attachment to the place in which they live; A red light is a signal of danger.*

(*c*) When the subject and predicate in point of fact are not united, but there is nothing in the nature of things to prevent their union, the proposition is said to be in *possible* matter, as, *Horses are not long-*

*lived; Omnibus drivers are not remarkable for excessive smoothness of tongue.*

(*d*) When the subject and predicate are of the very nature of things disunited so that they never are and never can be found together, the proposition is said to be in *impossible* matter, as, *The diameter of a circle is not greater than the circumference; What is past cannot be undone.*

These four different kinds of Propositions may be reduced to two, viz., *necessary* and *contingent.* Propositions in impossible matter simply mean those in which the predicate is necessarily separated from the subject. There is an element of uncertainty common both to Propositions in contingent and to those in possible matter. The fact that two ideas that may or may not be united are always found together in point of fact, does not give to their union a necessary character.

II. This second Division is based on the tie or link which binds together the subject and the predicate, and which is called the *copula.* It is of the essence of a proposition to make some statement, or to enounce something, and as such enouncement either affirms or denies according to the character of the copula, on the character of the copula depends the essential quality of the proposition. Hence, according to their *form* or *essential quality*, Propositions are divided into *affirmative* and *negative*, and into *true* and *false.*

An *Affirmative* Proposition (πρότασις κατηγορικὴ or καταφατικὴ), is one in which the copula unites together the subject and the predicate, and pro-

claims their identity, as *Novels are works of fiction.* A *Negative* Proposition (πρότασις ἀποφατικὴ or στερητικὴ), is one in which the copula disunites the subject and the predicate, and proclaims their diversity, as *Novels are not text-books of philosophy.*

There are some cases in which the presence of a negative in the proposition does not render it a negative proposition, and affects not the copula but the subject or predicate. Such propositions are sometimes called in Latin *Propositiones infinitæ*, in that their subject or predicate is indefinite in extent, being limited only in its exclusion from some definite class or idea: as, *Not to advance is to recede, Rebellion is non-submission to lawful anthority, Heresy is not to acknowledge as true the teaching of the Church, All the actions of the lower animals are non-voluntary.* These propositions may be reduced without difficulty to the ordinary form: *He who fails to advance recedes, Rebellion is a refusal to submit, Heresy is a disavowal of the teaching of the Church, No actions of the lower animals are voluntary.*

We pointed out in a previous chapter the distinction between *indefinite* terms on the one hand, and *negative* or *privative* terms on the other, between non-voluntary and involuntary, non-religious and irreligious. The one is a direct denial of the positive term to which it is opposed, the other denies it indirectly, by asserting something else. If I say that a book is non-religious, I mean that there is nothing about religion in it, and that the question of religion does not come in; nay, there is something more implied in the expression, I imply that there is no

room for religion in the book, or at all events there is no need for bringing in religion. I imply that the book itself lies outside the matter of religion, and not merely that religion is absent from its pages. This distinction is an important one in guarding against fallacies, as we shall hereafter see.

But if the essential quality of propositions is to affirm or deny, they have another quality which flows from the fact of their making an *affirmative* statement or *negative*. Such a statement must either be in accordance with facts or not. If it agrees with the external reality it is said to be *true*, if it does not, it is said to be *false*.

This brings us back to a question we had occasion to allude to in our first chapter. How far is Logic concerned with the truth or falsity of propositions? We cannot attempt to discuss it at length, but it will be useful to lay down one or two principles to guide us in answering this question.

What do we mean by *truth?* We are not speaking of truthfulness or moral truth, but of logical truth. *Truth* is by common consent allowed to be a statement of things as they really are. If this statement is an internal one, we have a true *judgment;* if it is an external one, a true *proposition*. If our judgments are always true, our propositions will always be true (supposing that our words correspond to our thoughts). Hence, a true proposition is the enunciation of a true judgment.

But what is a true judgment? It is one in which there is a conformity between that which the mind

affirms of some object of thought and that which the object is in itself. Logical truth is the correspondence of the understanding to the thing understood (*adæquatio intellectus cum re intellecta*). How far can Logic secure this correspondence?

We have seen that all Propositions are either *a priori* or *a posteriori*. In the former the predicate is contained in or necessarily united to the subject. In the latter the connection between the subject and predicate is not a necessary but a contingent one, dependent on the evidence of external facts, not simply on our own mental processes.

1. In all *a priori* propositions the logician can as such at once determine whether a proposition is true or false. He has only to analyze the subject, and see whether the predicate is contained in it, or united to it by some necessary law. If a friend were to make a voyage to the moon, and inform me on his return that he had found a circle of which the radii were not all equal, and that in the moon whenever you added together 5 and 7 it invariably made 14 instead of 12, I should opine that he had been so struck with the moon as to be moonstruck.

2. In *a posteriori* propositions the logician, as such, can determine that a proposition presented to him is false, if it is in opposition to some *a priori* law. If I were to be told, for instance, that of two roads from New York to Chicago one was shorter than the other, and on comparing them on a correct map to find that the one said to be shorter went along the two sides of a triangle, while the other travelled straight along the base, I should at once resent the

assertion, as being opposed to an *a priori* mathematical law.

3. Similarly, if a proposition presented to the logician is in opposition to some other proposition (of whatever kind) that he knows on other grounds to be true, he can proceed at once to pass sentence respecting the falsity of this new proposition. If I know that all hawks are carnivorous, and a friend tells me he has a hawk that will not touch meat, and eats nothing but biscuits and preserved apricots, I conclude that my friend is either joking with me, or is mistaken in thinking that his bird is a hawk. My knowledge of logical truth tells me that the proposition, *This hawk is not carnivorous*, is incompatible with, *All hawks are carnivorous*, and therefore is false.

4. But in the case of *a posteriori* propositions which are opposed neither to any law of thought, nor to any knowledge I already possess, Logic is incompetent to deal with their truth or falsity. If I am asked to accept the proposition, *The moon is made of green cheese*, there is no means of saying whether it is true or false, unless indeed I have already made my own some proposition respecting the composition of the moon, which is at variance with the one now presented to me. If I am told that in China there are blue flamingoes which sing beautifully, I may smile incredulously, but I cannot contradict the statement unless I have, either from a knowledge of the internal nature of the flamingo, or from the testimony of others, already accepted among my convictions the propositions: *All flamingoes are red, No flamingoes are musical.* In a word, Logic

can detect *formal*, but not *material* truth and falsity, *i.e.*, it can determine truth or falsity if it can be decided by the formal laws of Thought, but not if external investigation and experience are required to verify the propositions in question.

III. The third Division of Propositions is based upon their *quantity*; that is, the number of individuals to whom they are applicable. In this division the predicate is not concerned; it is the extension of the subject on which alone depends the quantity of the proposition.

Propositions are divided according to their quantity into *Universal*, *Particular*, *Singular*, and *Indefinite*.

1. A *Universal* Proposition is one in which the predicate is asserted of each and all the individuals comprised under the subject. The subject has the sign *all* or *none* prefixed to it, and is said to be *distributed*, or used distributively, as, *All flatterers are dangerous companions*, *All material things are liable to decay*, *No squares have five sides*.

We must, however, distinguish three kinds of Universality.

(*a*) Metaphysical or Perfect Universality, in which the subject and predicate are so inseparably united, that under no possible circumstances and in no possible case can they be separated, as, *All circles are round*, *No irrational animals can commit sin*.

(*b*) Physical Universality; when the subject and predicate are invariably and inseparably united according to the ordinary course of nature, but may be separated by the power of God or by a miracle,

as, *No man can be in two places at the same time, All dead bodies decay.*

(*c*) Moral Universality, where the subject and predicate are in the opinion of man generally found together, though the law admits of some exceptions, as, *All bullies are cowards at heart, No learned men are noted athletes.*

All three are true Universals. The first is based on the nature of things, and, therefore, never can be reversed. The second on the ordinary laws which govern the universe, which the Author of those laws can set aside at His good pleasure. The third on the general characteristics of human nature, which, however, the free will of man renders only true within certain limits, and so far as men are taken in the mass, and not necessarily in each particular case. Hence any deduction from the last kind of Universal must be drawn with exceeding caution, and must not be regarded as certainly established.

2. A *Particular* Proposition is one in which the predicate is asserted of a portion of the individuals comprised under the subject, and which has the sign *some* prefixed to it, and is said not to be distributed. *Some lawyers take snuff; Some boys are not mischievous.* There are Particular Propositions to which is prefixed a sign of universality, by which we must be careful not to be misled. The proposition, *All men have not faith,* is really a Particular, in spite of the word *all* with which it commences, and is equivalent to *Not all men have faith* or *Some men have not faith.*

3. A *Singular* Proposition is one in which the predicate is asserted of one, and one only, of the individuals comprised under the subject, as, *Cæsar is famous in history, This stone is valuable.*

Under what head are we to class Singular Propositions? Under Universals or under Particulars? It may be said that in a Singular Proposition the predicate is asserted of the whole of the subject, and, therefore, that Singulars should be reckoned as Universals. This is not the question, but whether, when the predicate is asserted only of one member of the class, it is asserted only of a portion, or of all the class. Now if I say, *This Hottentot is a great rascal,* my assertion has reference to a smaller portion of the Hottentot nation than the proposition *Some Hottentots are great rascals.* The same is the case even if the subject be a proper name. *London is a large city,* must necessarily be a more restricted proposition than, *Some cities are large cities;* and if the latter should be reckoned under Particulars, much more the former. A Singular term has no extension whatever, and a Singular Proposition is to be reckoned as the most limited possible form of which the Particular is capable.

4. An *Indeterminate* or *Indefinite* Proposition is one in which the subject has no sign of quantity going before it, as, *Frenchmen are polite, Angels are spiritual beings.* How are we to deal with Indeterminate Propositions? We must manage to decide their quantity for them somehow. When I say that *Frenchmen are polite,* do I mean *some* Frenchmen, or *all* Frenchmen? When I say that *Angels*

*are spiritual beings*, do I mean *some* Angels, or *all* Angels? In order to decide this question with regard to any given Indefinite Proposition, we have to refer to the Division of Judgments, given above.[1] We there said that all Judgments are either *a priori* or *analytical*, when the subject and predicate are necessarily connected together, or *a posteriori* or *synthetical*, when the union of subject and predicate is based on experience, not on the inner nature of things. In the latter case they are united, so far as we know, in point of fact, but there is no absolute necessity for their union, and a wider experience might reveal them apart from one another. The former are said to be drawn in *necessary*, and the latter in *contingent* matter, because the subject and predicate, the matter of the proposition, in the one case *must* be united, and in the other *may* be united.

When an Indefinite Proposition is presented to us, and we have to assign it a quantity, we have to ask ourselves whether the subject and predicate are of absolute necessity connected or not; whether they *must* be found together, or whether they *may* sometimes be found together, at another time be found apart. If the former, the proposition in question is a Universal; if the latter, a Particular. Thus, if I am asked to assign a quantity to the proposition, *Triangles have all their interior angles equal to two right angles*, I recognize at once the necessity of the connection between the nature of a triangle and the sum of its angles, and pronounce it at once a Universal. If I have to decide re-

[1] Pp. 256, 257.

specting the proposition, *Dwellers in cities are weakly*, I ask myself whether a dweller in a city must be weakly by the nature of things, and I perceive that there is no necessary connection between city life and feeble health, and I therefore pronounce the proposition to be a Particular, viz., *Some dwellers in cities are weakly*. It is true that there are many cases in which it is difficult to decide whether the connection between subject and predicate is necessary or not. Thus, if I am asked to assign a quantity to the proposition, *Bears are four-footed animals*, I consider whether there could by any kind of possibility be a biped to whom we should give the name of Bear on account of its similarity to the quadruped familiar to us. If there should be discovered an animal in all things like to Bruin, but walking always on two legs, should the name of the Bear be given to it? We leave our readers to settle the question of fact. It is only the duty of the logician to say that on the answer to it will depend the quantity of the proposition; whether we are to say that *Some bears are four-footed animals*, or *All bears are four-footed animals*.

But we have been speaking hitherto only of the extension of the *subject* of the proposition. Is the predicate never distributed, *i.e.*, used of each and all the members of the class? The extension of the proposition does not depend on the extension of the predicate, and when the predicate is used in all its extension, there is, as a rule, no sign of universality prefixed to it. Yet it is necessary to the due understanding of the nature of the proposition that we

should know when the predicate is distributed, *i.e.*, used in all the fulness of its extension, so as to have reference to all the members of the class, and when it is not. We may lay down the following rules respecting the Distribution of the Predicate.

I. In an Affirmative Proposition the predicate is not distributed, at least as far as the form of the proposition is concerned. If I say, *All omnibuses are public or private vehicles*, I am not speaking of the whole of the class of public or private vehicles, for there are carts, cabs, coaches, broughams, &c., as well. So if I say, *Some books are very uninteresting*, it is equally clear that I do not exhaust the class of uninteresting objects, or speak of the whole of them.

But we must observe here that we say that in an Affirmative Proposition the predicate is not distributed so far as concerns the *form* of the proposition. But there are cases in which in virtue of the *matter*, *i.e.*, by reason of the particular objects referred to, it may be distributed. This is the case in all Definitions. When I say, *All triangles are three-sided figures*, I am speaking of all three-sided figures as well as of all triangles, and it is quite as true that *All three-sided figures are triangles*, as that *All triangles are three-sided figures*. This holds good, not only of all Formal Definitions, but of every sort of Definition and Description. If I describe the cuckoo as a bird which is wont to lay its eggs in the nest of another bird and utters a cry corresponding to its name, my rather roundabout description will, if put in the form of a Universal Proposition, distribute its predicate in virtue of the

fact that there are no other birds that imitate the peculiarities of the cuckoo.

The same is true if I give a synonym, as, *A sycophant is an interested flatterer*, *All giraffes are camelopards*, and it applies also to all propositions in which the predicate is the *differentia* or any other property belonging exclusively to the class which forms the subject as, *All men cook their food*, *All spiders are web-spinners*, since there are no other beings in the world save men who cook their food, no insects which spin webs save spiders.

II. In a Negative Proposition the predicate is always distributed, that is, every individual belonging to the class is included in the assertion made. It matters not whether the proposition is Universal or Particular, or whether the subject of the proposition is distributed or not. The presence of a negative affecting the copula always involves the distribution of the predicate. Thus in the proposition, *No savages are men of letters*, the whole of the class of literary men is excluded from the class of savages as well as the whole of the class of savages from the class of literary men. In the proposition, *Some kettles are not made of tin*, the whole of the class of articles made of tin is excluded from the particular set of kettles referred to, and these in their turn are excluded from the whole class of articles of tin.

Hence we arrived at the following rules for the distribution of the terms of a proposition. *Universal Propositions distribute their subject*, *Negative Propositions distribute their predicate*, or if we call the Universal Affirmative by the letter A, the Universal

Negative by the letter E, the Particular Affirmative by the letter I, the Particular Negative by the letter O, our rules for distribution will be:

A distributes the subject only;
E distributes both subject and predicate;
I distributes neither subject nor predicate;
O distributes the predicate only.

These letters are commemorated in the mnemonic lines:

A asserts and E denies,
  See, they each the whole comprise;
I asserts and O denies,
  Each to some alone applies.[1]

To these convenient letters we shall presently recur.

[1] Asserit A, negat E, verum generaliter ambae.
Asserit I, negat O, sed particulariter ambo.

## CHAPTER III.

### IMPORT OF PROPOSITIONS. VARIOUS KINDS OF PROPOSITIONS.

Import of Propositions—Comprehension and Extension—Primary Import of Propositions—The Predicate not quantified in thought — Sir W. Hamilton's theory — Various kinds of Propositions — Categoricals and Hypotheticals — Conditional Propositions — Disjunctive Hypotheticals — Pure and Modal Propositions—Nature of Modal Propositions.

WE have seen that Propositions may be divided according to their matter into Necessary and Contingent; according to their essential quality into Affirmative and Negative; according to their accidental quality into True and False. According to their quantity we have divided them into Universal, Particular, Indefinite, and Singular; and we have assigned Indefinite Propositions to the class of Universal or Particular according as they are *a priori* or *a posteriori* propositions, while Singular Propositions we have relegated to the class of Particulars. We must now pause for a moment to say a few words on the Import of Propositions, and what it is we mean by our assertion of the agreement or disagreement of subject and predicate. This we must discuss a little more at length, and in connec-

tion with this we must consider the proposal of a modern teacher of Logic, which, if it were adopted, would revolutionize Formal Logic.

We have already defined a Proposition as a Judgment expressed in words, and a Judgment as a mental act which unites or disunites two objects of thought. But we may think of an object of thought under two different aspects, either as an *idea*, comprising a number of simpler ideas, or as a *class*, containing a number of smaller classes; or, to use a nomenclature already familiar to our readers, as a whole of *comprehension*, or a whole *of extension*.

This we have already explained at length. What we have now to decide is the aspect under which we regard the subject and predicate of a proposition. When I say that *All chaffinches are birds*, do I mean that my idea of chaffinch comprises my idea of bird, that in all the individuals in which are found realized the idea of chaffinch will also be found realized the idea of bird, or do I mean that the smaller class of chaffinches is comprised in the larger class of birds? Do I think of chaffinch and birds as ideas or as classes? Of the attributes they comprehend, or of individuals over which they extend?

What is it that naturally occupies our mind when we examine any sort of proposition? If we ask ourselves this question, we shall find that we turn instinctively to the inner nature of subject and predicate, to the simple ideas which make up the more complex idea, and look to these in order to discover whether our proposition is true or false. If any one asks me respecting the meaning of the pro-

position, *All garnets are precious stones*, I unconsciously begin to analyze my idea of a garnet and my idea of a precious stone to see if they coincide. I think of all that is contained in the idea of garnet and the idea of precious stone; of all the marks of a precious stone that divide it off from all other stones, and I examine whether these marks are all found in the idea of a garnet. If again I should assert that *No shopkeepers are learned men*, I must first analyze my notion of a shopkeeper and all that is comprehended under the term, and I must also analyze my idea of learned men; and then compare together the contents of each, to see if there is any contradiction between the attributes which belong to the shopkeeper as such, and those which belong to learned men as such. I shall not be justified in laying down the proposition unless such contradiction can be shown to exist.

Do I at the same time think of the subject and predicate as *classes?* It is true that when I say all garnets are precious stones, the word *all* implies that if all the garnets existing in the world were brought together into a big heap, this heap would be found to be a small portion of a larger heap comprising all the precious stones of the universe. But this is not what is present to my mind *primarily* and as the Import of the proposition. I am not thinking of garnets as a class.[1] I do not cast my

[1] This is excellently expressed by Mill. "When I judge that *All oxen ruminate*, what do I mean by all oxen? I have no image in my mind of all oxen. I do not, nor ever shall, know all of them. and I am not thinking even of all those I do know. 'All oxen

mental eye over a collection of garnets to see whether there may not be among them one which is not a precious stone, but I pierce by my power of mental sight the nature of the garnet to see whether there may be among the characteristics of a precious stone one which is not found in it. In technical terms I look not to the *extension*, but to the *comprehension* of the *subject*. I regard it as an idea, not as a class.

If this is so with the subject, much more is it the case with the predicate. When I say *All garnets are precious stones*, there may be some excuse for the notion that I am speaking of the class of garnets, as the word *all* gives a certain colour to it. But there is no sort of ground for asserting that I am thinking of precious stones as a class, or considering whether *all* or *some* of them are comprised in the class of garnets. All that I am thinking of is that the idea of precious stone is invariably united to the idea of garnet. What I have in my mind is the two ideas and their co-existence. It is true that by a further process I may turn my mind to the consideration of the question whether there are other precious stones besides garnets; whether garnets constitute the whole class of precious stones

in my thoughts does not mean particular animals—it means the objects, whatever they may be, that have the attributes by which oxen are recognized, and which compose the notion of an ox, wherever these attributes shall be found. There, as I judge, the attribute of ruminating will be found also: that is the entire import of the judgment. Its meaning is a meaning in attributes, and nothing else. It supposes subjects, but merely as all attributes suppose them." (*Examination of Sir W. Hamilton's Philosophy*, p. 425.

or only a part of it. But in the original proposition I took no notice of this question, and when I consider it now, I do not by considering it elicit any fresh information as to whether I have been speaking of all precious stones, or only of some. My statement has been an indefinite one, and indefinite it must remain, as far as the force of the terms is concerned. If I say, *All men are rational animals*, it may be quite true that the whole of the class of rational animals is exhausted by the class of men, but as far as the proposition is concerned this is not the case. When I turn from the natural meaning of the proposition which asserts the co-existence of the two ideas, to the question of the respective extension of the two classes, I have no data for deciding whether I am alluding to the whole of the class of rational animals or only to some of them. I can learn this fact only by external inquiry. I must search all through the universe before I can decide the question whether there are other rational animals besides men, whether there are Houyhnhnms in Sirius or in the moon. As a logician, with nothing before me but the proposition, *All men are rational animals*, I know nothing about it.

What does all this amount to? That in a proposition I speak neither of the subject or the predicate as classes, but as ideas. I have before me their comprehension, not their extension. In the case of the subject, when the proposition is a Universal, I have before me, in the sign of quantity attached to it, the means of knowing that the whole

of the class is included, but I have no such source of information with respect to the predicate. In other words, *we do not in thought quantify the predicate of propositions.*

It is strange in face of these facts to find a man of the ability of Sir W. Hamilton proposing to quantify the predicate of all propositions. He makes this proposal on the ground that we ought to state in language what is already understood in thought. This principle is a perfectly sound one, but unhappily for his argument, we do not, as I have shown above, quantify the predicate in our thoughts. Let us hear what he has to say on the subject.

"In a proposition, the two terms, the Subject and Predicate, have each their quantity in thought. This quantity is not always expressed in language, for language always tends to abbreviation; but it is always understood. For example, in the proposition, *Men are animals*, what do we mean? We do not mean that *some men*, to the exclusion of others, are animals, but we use the abbreviated expression *men* for the thought *all men*. Logic, therefore, in virtue of its postulate, warrants, nay requires, us to state this explicitly. Let us, therefore, overtly quantify the subject, and say, *All men are animals.* So far we have dealt with the proposition,—we have quantified in language the subject, as it was quantified in thought. But the predicate still remains. We have said—*All men are animals.* But what do we mean by *animals?* Do we mean *all animals*, or *some animals?* Not the former; for dogs, horses, oxen,

&c. are animals as well as men, and dogs, horses, oxen, &c., are not men. Men, therefore, are animals, but exclusively of dogs, horses, oxen, &c. *All men*, therefore, are not equivalent to *all animals;* that is, we cannot say, as we cannot think, that *all men are all animals.* But we can say, for in thought we do affirm, that *all men are some animals.*"[1]

All this goes on a false assumption as to the import of propositions. It assumes that the extension of the terms of a proposition is present to our mind when we lay down the proposition; that when I say *All men are animals*, I am not merely explicitly stating the coincidence of two ideas, but am also explicitly stating the inclusion of one class in a larger one. It also implies, that when I assert this proposition, I am in thought affirming either *All men are all animals*, or, *All men are some animals*, whereas in point of fact I do nothing of the sort; I am not thinking of animals as a class at all, but simply as an idea coincident with my idea of man. When Sir W. Hamilton goes on to say that a proposition is simply an equation between two notions in respect of their extension, he shows so complete a misconception of what the meaning of a proposition is, that we are not surprised at the wild proposals into which he is drawn by his untrue theory. It is not true that a proposition states the inclusion of the class in a larger one, or the co-extension of two classes of the same extension. It is not true that a proposition is an equation between the subject and

[1] *Sir W. Hamilton's Lectures*, Vol. IV. pp. 270, 271.

the predicate. It is not true that when we say *All men are animals* we in any way admit the question whether there are other animals besides men; and therefore to advert to it in language would be a misrepresentation of our thoughts. Instead of being an improvement in Logic, it would divorce Logic from ordinary language and introduce into it a phraseology not only clumsy and mischievous in practice, but founded on a false assumption. Hence his whole doctrine respecting the quantification of the predicate, as based on a false theory, falls to the ground.

It is true that it has certain conveniences in that it would simplify certain logical processes and that there are certain propositions which appear to be (but are not really) an equation between the subject and predicate. But it is strange that a man of Sir W. Hamilton's ability could be led astray by so wild a theory, and should venture to condemn Aristotle and all philosophers who follow in his steps as guilty of a cardinal error because they did not recognize in Propositions a meaning rejected by mankind generally, or force them into an unnatural shape which no one would adopt outside the pages of a logical manual.

We now proceed to distinguish various kinds of Propositions. Our examples hitherto have been only of the simplest form of Proposition, in which the agreement or disagreement of the subject and the predicate is asserted in the most plain and straightforward way. Such propositions are termed in

Logic *Categorical Propositions*, as making a simple statement. But they are opposed to *Hypothetical Propositions*, which state only the dependence of one statement on another.[1] Hence:

I. Propositions are divided into *Categorical* and *Hypothetical*.

A *Categorical* Proposition asserts the agreement or disagreement of the subject and predicate without any sort of condition or alternative. Categorical Propositions are either *simple*, when there is a single subject and a single predicate, as *The inhabitants of all wine-producing countries are temperate;* or *compound*, when several subjects and predicates are united by connecting particles in a single sentence, as *No man or angel can create a grain of dust; This boy is both headstrong, idle, and quarrelsome. Where your treasure is, there will your heart be also.* Such compound propositions can always be broken up into two or more simple propositions.

A *Hypothetical* Proposition asserts the dependence of one proposition on another as, *If men grumble they are miserable.* Hypothetical Propositions admit of three subdivisions.

1. A *Conditional* Proposition contains two categorical propositions united together in such a way that the one is the condition on which the other depends, as *If trade is bad, the poor suffer for it. If a novel is dull, the sale will not be large.*

[1] The use of the word categorical (κατηγορικὸς) in this sense, is not Aristotelian, but was introduced by later logicians. As we have stated above, categorical, in Aristotle, has the meaning of affirmative as opposed to negative.

A Conditional Proposition consists of two parts:

1. The antecedent or condition: *If trade is bad.*
2. The consequent or thing conditioned: *The poor suffer for it.*

A Conditional Proposition may be either affirmative or negative. In an affirmative conditional it is asserted that the fulfilment of the condition involves the truth of the consequent. In a negative conditional it is denied that the fulfilment of the condition involves the truth of the consequent, as *If this man is unfortunate he is not therefore to be despised.*

We must notice that the presence of a negative in either or both parts of a conditional proposition does not render it a *negative* proposition, unless the negative affects the copula, so as to render the whole proposition a denial of the existence of any dependence of the consequent on the antecedent, *e.g., If this man is not guilty, he will not be condemned to death,* is an affirmative proposition, though both the antecedent and consequent are negatives.

2. A *Disjunctive* Hypothetical Proposition is made up of two or more Categorical Propositions united by a disjunctive particle, as *Either Socrates was an enemy of religion, or the Athenians were unjust in putting him to death. A man who asserts his own freedom from defects is either a liar or a fool.* In Disjunctive Hypothetical Propositions the following Rules must be observed:

Rule 1. *The different members of the propositions must exhaust every possible alternative.*

Thus if I laid down the proposition, *Every one who becomes rich acquires his money either by trade or by speculation*, my proposition would be false because I omit other methods of acquiring money, such as by some profession, inheritance, &c. Similarly, if a man is found drowned, and I lay down the proposition, *Either this man was murdered, or he committed suicide*, my proposition is faulty, in that it omits the third alternative, that he may have fallen into the water by accident.

Rule 2. *All the members must not be true together.* If they are, there is no true disjunction between them, *e.g.*, *Either a triangle has three sides, or it has three angles.*

Rule 3. *All the members must not be false together.* For if they are all false, every alternative is not exhausted and Rule 1 is broken: for example, *Either Charles I. was a just King, or his subjects were justified in putting him to death.*

3. A *Conjunctive* Hypothetical Proposition is one which consists of simple propositions which are incompatible, joined together by an affirmative particle, as *No one can have his cake and eat it.* Or it may be described as a proposition which denies that the two simple propositions it contains can be at the same time true. It is necessarily always negative in form.

II. Propositions are also divided into Pure and Modal.

A Pure Proposition (*propositio de inesse*) is one in

which the assertion of the agreement or disagreement of the subject and predicate is made simply and without any qualification, as *Equilateral triangles are equiangular.*

A Modal Proposition is one in which the predicate is said to agree or disagree with the subject in a particular mode or manner, as *Equilateral triangles are necessarily equiangular.*

The mode does not affect the subject only, nor the predicate only, but the connection existing between them. The distinction between Modals properly so called, and other propositions which are sometimes called Modals, is to be found in this, that in Modals properly so called the mode affects the copula, as *The ex-Cathedra definitions of a Pope are necessarily true; The sentence passed by any of the English judges is possibly a false one.* In all other Modals it affects the predicate, as *Hares run swiftly*, when the adverb *swiftly* affects not the copula but the predicate, and the proposition is equivalent to the simple proposition, *Hares are swift of foot*, and therefore not a true Modal.

There are four Modes: the Necessary, the Contingent, the Possible, and the Impossible. All other modes are variations of these: the Certain is but another form of the Necessary, the Uncertain of the Contingent, the Probable of the Possible joined to a certain approbation on our part and a certain leaning to its truth.

How are we to deal with Modals? They are really only simple Categorical Propositions of which the word expressing the mode is the predicate.

Thus, *The statements of informers are possibly false* is equivalent to *The falseness of an informer's statements is possible;* or, *It is possible that an informer's statements should be false. Many of the cures at Lourdes are certainly miraculous* is equivalent to *That many of the cures at Lourdes are miraculous is certain.* This is the only true way of dealing with Modals. In some cases a Modal is equivalent to a Universal Proposition, and an Indefinite Modal may often by reason of its *mode* be resolved into a simple proposition; Universal, if the mode is the Necessary or the Impossible; Particular, if it is Contingent or Possible. Thus: *Men are necessarily mortal* is equivalent to *All men are mortal. Street beggars are probably undeserving* is equivalent to *Some street beggars are undeserving.* But in each case some portion of the meaning and force of the proposition is lost if it is thus transformed.

# CHAPTER IV

## ON THE OPPOSITION AND CONVERSION OF PROPOSITIONS.

Opposition of Propositions—Various kinds of Opposition—Laws of Opposition—Contraries and Subcontraries—Conversion—Various kinds of Conversion—Laws of Conversion—Conversion *per contra*—Value of Conversion *per contra*.

WE discussed in our last chapter the Import of Propositions, and condemned the quantification of the predicate proposed by Sir. W. Hamilton as false in theory and unworkable in practice. We further distinguished various kinds of Propositions from each other, *Categorical* from *Hypothetical*, and *Conditional* from *Disjunctive;* and we laid down certain rules which govern each. We divided Propositions, moreover, into *Pure* and *Modal*, and pointed out what constitutes modality properly so called, and how Modals are to be dealt with.

We now come to the relation to each other of Propositions having the same subject and predicate. If they have the same subject and predicate and yet are not identical, there must be some diversity between them, and this diversity must consist either in a difference of quality, in that one of them is

affirmative and the other negative, or of quantity, in that one is universal and the other particular, or in difference both of quantity and quality, one being universal and affirmative, the other particular and negative, or else the one being universal and negative, and the other particular and affirmative.

Such propositions are said to be *opposed* to each other, although, as we shall see, the opposition is in some cases verbal rather than real. And as there are four kinds of propositions, Universal Affirmative, Universal Negative, Particular Affirmative, and Particular Negative, which we called respectively by the letters A, E, I, O, there will be four kinds of opposition, according as the opposition is between two Universals or between two Particulars, or between a Universal and a Particular of the same quality, or between a Universal and a Particular of a different quality.

1. Contrary Opposition (ἐναντίωσις) is between two Universal Propositions, A and E, one of which is affirmative and the other negative, as between

*All schoolboys are mischievous* . . (A)
*No schoolboys are mischievous* . . (E)

2. Contradictory Opposition (ἀντίφασις) is between a Universal Proposition and a Particular differing from it in quality; *i.e.*, between A and O, or between E and I, as between

*All schoolboys are mischievous* . . (A)
*Some schoolboys are not mischievous* (O)

or between

*No schoolboys are mischievous* . . (E)
*Some schoolboys are mischievous* . (I)

3. Subcontrary Opposition is between two particulars, one of which is affirmative and the other negative, *e.g.*,

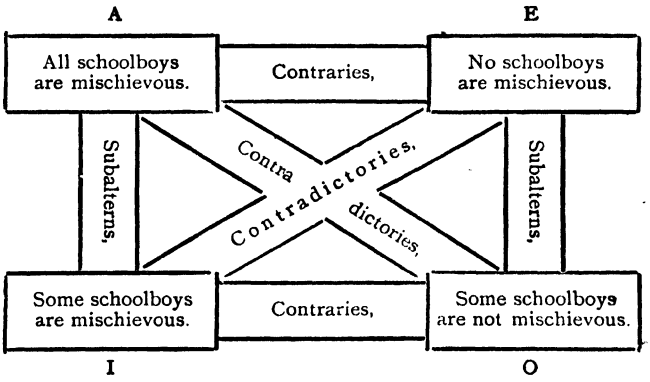
{ *Some schoolboys are mischievous* . . (I)
{ *Some schoolboys are not mischievous* . (O)

4. Subaltern Opposition is between a Universal and the corresponding particular, *e.g.*, between A and I, and between E and O, as,

{ *All schoolboys are mischievous* . . . (A)
{ *Some schoolboys are mischievous* . . (I)

or between

{ *No schoolboys are mischievous* . . (E)
{ *Some schoolboys are not mischievous* . (O)




These last two kinds of opposition are not really deserving of the name; there is no real opposition between Subcontraries and Subalterns. In the instance we have given the two Subcontraries are both true at the same time; while if the Universal is true

the Particular is always true. There may, however, be a real opposition between the Universal and the Particular, if the latter is intended as a correction of the Universal. If a nervous old bachelor declares testily that *All schoolboys are mischievous*, and therefore he will not have his little nephew home for the holidays, and I in opposition to him say: *No, sir, you are wrong*, some *schoolboys are mischievous, but your nephew Charlie is a most well-behaved lad, quite the reverse of mischievous*, it is true that there is an opposition between the Universal asserted by the old gentleman and the Particular which I substitute for it. But this only arises from the special matter in question. The mere emphasis that I throw on the word *some* shows that my assertion gives my friend to understand that if some schoolboys are mischievous, some are not.

Between the two Particulars there never can be any opposition, since the objects of which they speak are altogether different. The section of schoolboys of whom I assert that they are not mischievous, in the proposition, *Some schoolboys are not mischievous*, is altogether apart from the section of which some one else may justly affirm that they are mischievous in the proposition, *Some schoolboys are mischievous*.

We may now give the Laws of Opposition.

1. *Contraries cannot be true together, but can be false together.*

(*a*) They cannot be true together, for if it is true that the predicate (mischievousness) is to be assigned to every member of the class that forms the subject

(schoolboys), it must be false that the same predicate is to be assigned to no member of the class.

(*b*) They may be false together, for it may happen that the predicate is to be assigned to some members of the class and not to others. Hence from the truth of any proposition may be inferred the falsity of the contrary, but from the falsity of any proposition the truth of the contrary cannot be inferred.

2. *Contradictories can neither be true together nor false together, but one must be false and the other true.*

(*a*) They cannot be true together, for if the predicate is applicable to every member of the class that forms the subject, it must be false that it is not applicable to some members of the same class. If schoolboys each and all are mischievous, it must be false that some of them are not mischievous.

(*b*) They cannot be false together, for if it is applicable to all the members of the subject, it follows that it is true that there are some to whom it is not applicable.

Hence from the truth or falsity of any proposition can be inferred the truth or falsity of its contradictory.

3. *Subcontraries may be true together, but cannot be false together.*

(*a*) They may be true together since the predicate may refer to different portions of the same class which forms the subject. If I say, *Some schoolboys are mischievous and some are not,* I am speaking of different subdivisions of school-

boys, and both my propositions may be perfectly correct.

(*b*) But they cannot be false together, for if a Particular is false the contradictory of it is true, and if the Universal is true the Particular coming under it is also true. If it is false that some schoolboys are not mischievous, it must be true that all schoolboys are mischievous, and much more that some schoolboys are mischievous.

Hence, if one of two subcontraries is true, the other may be true and may be false, but if one of them is false the other must be true.

4. *Subaltern Propositions may be true together, or false together.*

This is because the Particular is included in the Universal. But the truth of the Universal implies the truth of the Particular, and the falsity of the Particular implies the falsity of the Universal.

If it is true that all schoolboys are mischievous much more is it true that some schoolboys are mischievous; if it is false that some schoolboys are mischievous much more is it false that all schoolboys are mischievous. But the truth of the Particular does not imply the truth of the Universal, and the falsity of the Universal does not imply the truth of the Particular, as is sufficiently obvious.

Opposition in the case of *Compound* and *Modal* Propositions follows exactly the same laws as that of those that are *simple* and *pure*.

ON THE CONVERSION OF PROPOSITIONS.—By the Conversion of a Proposition we mean the transposition

of its terms so that the predicate becomes the subject and the subject the predicate. The new proposition thus formed must either be equivalent with the original, or at least must be included under it, as we shall see. There are three kinds of Conversion.

1. Simple Conversion takes place when, after the transposition of the terms, the quantity of the proposition, and also the quality remain the same. If the subject and predicate were Universal before, Universal they must remain; if Negative, Negative; if Affirmative, Affirmative they must remain; if Particular, Particular; as

*Some old men are talkative,*
*Some talkative creatures are old men.*

*No good Christians are cannibals,*
*No cannibals are good Christians.*

2. Conversion *per accidens* takes place when the Universal Proposition after conversion becomes a Particular, as

*All Catholics regard the Pope as infallible,*
*Some who regard the Pope as infallible are Catholics.*

*No good Christians are cannibals,*
*Some good Christians are not cannibals.*

3. Conversion *per contra* takes place when an Affirmative Proposition after conversion becomes Negative, or a Negative becomes Affirmative, as

*All men who rise high in their profession are men of ability,*
*No men who are not men of ability rise high in their profession,*
or, *None but men of ability rise high in their profession.*

*No animals that do not suckle their young are mammals,*

*All mammals suckle their young.*

The Laws of Conversion are as follows:

1. *The Universal Negative and the Particular Affirmative are capable of Simple conversion.*

(*a*) The Universal Negative, for since the subject is wholly excluded from the predicate, it follows that the predicate is wholly excluded from the subject. If triangle is excluded from quadrilateral, quadrilateral is excluded from triangle.

(*b*) The Particular Affirmative, for it asserts the partial agreement of the subject with the predicate, whence it follows also that the predicate partially agrees with the subject.

2. *The Universal Affirmative and Universal Negative are capable of conversion* per accidens.

(*a*) The Universal Affirmative, for if the Universal Affirmative, *All rogues are liars*, is true, the Particular Affirmative, *Some rogues are liars* is also true, and therefore its converse, *Some liars are rogues*, is likewise true.

(*b*) The Universal Negative, for if the Universal which is the simple converse is true, the Particular will also be true. If it is true that, *No thieves are honest*, the simple converse, *No honest men are thieves*, is also true, and therefore, *Some honest men are not thieves*, is also true.

3. *The Universal Affirmative and the Particular Negative are capable of conversion by contraposition.*

Conversion by contraposition is based on the fact that to assert an agreement of two objects of

thought; is to deny the agreement of either of them with the contradictory of the other. To assert the agreement between gentleness and the nature of the turtle-dove is to deny the agreement between the nature of the turtle-dove and non-gentleness.

We desire to convert the Universal Affirmative, *All turtle-doves are gentle.* This proposition is equivalent to the Negative Proposition: *No turtle-doves are not gentle.* Now the Universal Negative can be converted simply, and the result will be a proposition which is the converse of the Universal Proposition with which we started, viz.:

*No not-gentle birds are turtle-doves;*
or, *None but gentle birds are turtle-doves;*
or, *Only gentle birds are turtle-doves.*

On the other hand, to assert the disagreement of two objects of thought, is to assert the agreement of each of them with the contradictory of the other. To assert the disagreement of the idea of politeness in some cases from that of costermonger, is to assert the agreement in those cases of costermonger with that of non-politeness.

*Some costermongers are not polite* . . (O)
*Some costermongers are not-polite* . . (I)

The Particular Negative has become a Particular Affirmative, and we are now able to convert it simply to,

*Some not-polite beings are costermongers;*
*Some who are not polite are costermongers.*

This sort of conversion is called Conversion by contraposition (ἀντιστροφὴ σὺν ἀντιθέσει), because we make use of the laws of opposition by putting one against the other, or *contraposing* the object of thought (gentle, polite), and its contradictory (not-gentle, not-polite), and argue from the truth or falsity of the one to the falsity or truth of the other.

This sort of Conversion is the only means of converting O. By it E may sometimes be converted, but only when there is a double negative, *e.g.*

*No circles are not round figures.*
∴ *No figures that are not round are circles.*

What are we to say about this Conversion by contraposition? We find no trace of it in Aristotle or St. Thomas. How is this if it is perfectly legitimate?

The answer seems to be that strictly speaking it is not Conversion at all. In Conversion the subject becomes the predicate, and the predicate the subject, while the copula remains unaltered. In this sort of Conversion it is true that the old subject becomes the new predicate, but the new subject, instead of becoming the same as the old predicate becomes its contradictory, while the copula which before was a negative separating the terms asunder, now becomes affirmative and unites them together, or if previously affirmative, now it appears as negative.

It can therefore be called Conversion only by courtesy and by reason of that laxer use of terms which distinguishes modern from ancient days. What we really have is not the converse of the convertend, but of a proposition which is equipollent

with the convertend. We restate the original proposition in an altogether different form. It is no longer O but I, no longer A but E. Having done so, we now have not the original proposition but the equivalent that we substituted for it.

These various kinds of Conversion are summed up in the following Latin mnemonic lines,[1] which inform us that E and I may be converted *simply*. E and A *per accidens*, A and O *per contra*, and beside these there is no other kind of conversion.

[1] FEcI *simpliciter convertitur*, EvA *per acci*
AstO *per contra, sit fit conversio tota.*

# LOGIC.

## PART III.

### ON REASONING OR ARGUMENT.

## CHAPTER I.

### ON REASONING.

**Reasoning—Analysis of its meaning—Foundations of Reasoning—Deductive and Inductive Reasoning—Argument—Canons of Reasoning—Premisses unduly assumed.**

A KNOWLEDGE of the truth, says St. Thomas,[1] constitutes the perfection of every spiritual nature. Some natures there are that at once comprehend and accept the truth without any reasoning process, as is the case with the angels. Others have to arrive at truth by a slow process of reasoning from the known to the unknown, as is the case with men. Hence angels are called *intellectual*, as distinguished from men who are *rational* beings. The angelic grasp of truth is something immediate, simple, and absolute, whereas man attains to it only mediately

[1] *De Veritate*, q. 15. art. 1.

and gradually, advancing with toil through the medium of reasoning or argument.

It is with *reasoning* that the Third Part of Logic is concerned. How are we to define it, and what are the various forms under which we reason?

Reasoning is the third operation of the human mind. As the first, Simple Apprehension, consists in apprehending ideas, and the second, Judgment, in comparing ideas together and pronouncing on their agreement or difference, so the third consists in comparing together judgments and deducing from them a further judgment, wherever the laws of thought permit of our so doing.

But Reasoning may be looked at in another light. In order that we may reason, the two judgments compared together must have one idea common to both of them either as subject or predicate. Reasoning consists in the comparing together of the other two ideas contained in these two judgments through the medium of that which is common to both of them, and pronouncing on the agreement or difference of these two ideas according to their respective relations to it. For instance, in the judgments, *All smoky cities are comparatively free from zymotic diseases; Cincinnati is a smoky city;* I compare together the two ideas of *Cincinnati* and *freedom from zymotic diseases* through the medium of *smoky city*, and by reason of the agreement of both of these with the same common idea, I am able to arrive at the conclusion, *Cincinnati is comparatively free from zymotic diseases.*

Reasoning then in its widest sense is *an act of the mind by which one judgment is inferred from some other*

*judgment or judgments previously known.* The judgment or judgments that precede are called the *antecedent*, that which is inferred the *consequent.* Or if we look at Reasoning under the other aspect, we may define it as *an act of the mind by which two ideas are compared with a third, and their agreement or difference thus ascertained.*

A judgment thus inferred from an antecedent judgment or judgments is called *mediate*, as opposed to *immediate* judgments, which are known at once and without needing the support of any previous knowledge. Immediate judgments fall into two classes.

1. First principles, universals, axioms, analytical or *a priori* propositions, the truth of which is known to us from the very nature of things, *e.g.*, *Nothing can be at the same time true and false; The whole is greater than its part; All effects have a cause.*

2. Truths of fact, particulars, and individual or empirical propositions; truths of experience, which depend on no general principle and can only be arrived at by observation or experiment, *e.g.*, *Saul was the first king of Israel; This ostrich is a long-lived animal; Chicago is a flourishing city; Bees lay up honey for their winter food.*

These two kinds of immediate judgments furnish us with our stock-in-trade when we reason: every conclusion at which we arrive, must be capable of being verified by its having been logically inferred in its ultimate origin from truths of fact or from first principles, or, as is generally the case, from a combination of the two.

But in most cases we do not go back to ultimate first principles. Sometimes we begin from some mediate principles agreed upon by mankind as true, and by combining these with other mediate principles similarly agreed upon, or with individual facts, arrive at our conclusion. For instance, I have deduced from ultimate first principles by a previous chain of argument, or I have received from the oral teaching of my instructors in my youth, the mediate principle, *All violation of the law of God entails misery.* I have also made my own the farther principle that, *Theft is a violation of the law of God;* and I thus arrive at the conclusion, that *Thieving never prospers.* Or I may go farther and apply my principle to the case of some one (A. B.) who has acquired money dishonestly, and I thus deduce the further conclusion that A. B. will never prosper.

Sometimes, again, we begin with individual facts, and from them infer some mediate universal, and then combine this with some other partial or mediate universal, and so arrive at some more widely extended principle. For instance, I may have observed the wonderful sagacity displayed by dogs belonging to myself and several of my friends, and from those observations I arrive at the conclusion: *Dogs are sagacious animals.* I hear or read stories of the sagacity displayed by horses, of their fertility of resource, their ingenious devices for gaining their ends, and I sum up my experience in another proposition: *Horses are sagacious animals.* My friends tell me similar anecdotes of cats. From books on animals I find the same cleverness common in

monkeys, in trained elephants, &c. I further reflect upon the fact that dogs, cats, horses, monkeys, &c., are the animals mostly chosen by man for his companions, and putting this and that together I arrive from my observation of things familiar to me at a general principle which was not familiar to me before, viz., that in animals sagacity and the companionship of man generally go together. Or, to put in a logical form my process of argument, *Dogs, horses, cats, &c., are sagacious animals; Dogs, horses, cats, &c., are the chosen companions of man;* therefore, *The chosen companions of man amongst the animals are remarkable for their sagacity.*

These two instances furnish us with examples of the two kinds of reasoning which exhaust every possible kind of argument, viz.:

1. Reasoning from the Universal to the Particular, *a priori* reasoning, reasoning from first principles (ὁ ἀπὸ τῶν ἀρχῶν λόγος).

2. Reasoning from Particulars to the Universal, *a posteriori* reasoning, reasoning to first principles (ὁ ἐπὶ τὰς ἀρχὰς λόγος).

Of these two kinds of reasoning the former is termed *deductive* or *syllogistic;* the latter *inductive* or *experimental.* Yet we must bear in mind that all inductive reasoning must be reducible to syllogistic form in order to be valid. Of this we shall have to speak when we come to treat of Induction. For the present it is enough to say that it is identified with the Syllogism in as far as it argues from a general principle (the uniformity of nature's laws), but differs from it in that it employs that general

principle to ascend from the observation of particular facts to a mediate principle based on them, instead of descending from some mediate or universal principle to the individual facts.

When Reasoning is expressed in words it is called *Argument* or *argumentation*. As the Syllogism is the natural type of all reasoning, every argument can be stated in the form of a Syllogism. In practice we do not generally state our syllogisms at full length, but omit one or other of the three propositions of which they consist, and often condense the two remaining into a single sentence.

For instance, the schoolmaster does not say elaborately to the unfortunate boy who is to be flogged:

*All boys who play truant must be flogged,*
*You, Ishmael Jones, are a boy who plays truant,*
∴ *You, Ishmael Jones, must be flogged,*

but he simply says: *All boys who play truant must be flogged, and therefore you, Ishmael Jones, must be flogged;* or, *You, Ishmael Jones, have played truant and must be flogged;* or, *You must be flogged for playing truant, Ishmael Jones.*

There are certain general canons common to all reasoning which we must notice before we pass on to the consideration of the Syllogism.

1. When the antecedent propositions or premisses of an argument are true, a false conclusion cannot be logically drawn from them. If falsehood seems to follow from truth, we shall always detect some flaw in the reasoning process if we examine it more closely. This needs no illustration or proof.

2. When the conclusion is true, it does not at all follow that the premisses are true. One or both of the premisses may be false and yet the conclusion perfectly correct in itself, and also correctly drawn from the premisses, *e.g.*,

*All the Roman Emperors were cruel tyrants;*
*Nero was one of the Roman Emperors;*
∴ *Nero was a cruel tyrant.*

Here one premiss is true, the other false, and yet the conclusion is true.

*All the Roman Emperors were cruel tyrants;*
*But Dionysius of Syracuse was not a cruel tyrant;*
∴ *Dionysius of Syracuse was not a Roman Emperor.*

Here both premisses are false and the conclusion logically drawn from them, but nevertheless the conclusion is true.

This principle is an important one on account of the tendency of mankind to judge of a line of argument by its final results. Some hypothesis is started from which there follows a conclusion which is confessedly in accordance with known facts, and men accept the hypothesis as an established truth merely because it is apparently founded upon the facts and accounts for their existence. Thus the corpuscular theory of light seemed so successfully to account for all the facts of the case that it was maintained by no less an authority than Newton. He held that light is caused by certain minute particles which pass from the luminous body and sticking on the eye, cause the sensation of light. In the present day the undulatory theory has ousted it

from the field, but there are still some of the phenomena which are more easily explained by the older hypothesis.

It is a neglect of this principle that has led to the premature acceptance of many scientific hypotheses, a great proportion of which have afterwards proved incorrect. The arguments of some geologists proving the extreme antiquity of man, because the "kitchen-middens" and the finding of flint instruments deep down in the earth were explained thereby. Mr. Darwin's theory that coral reefs were formed by subsidence, and his whole system of evolution and development in its relation to the formation of species and the development of man, are instances of premisses assumed as certainly established, because they accounted for a vast array of facts which had never before been subject to so imposing a process of generalization. But the truth of the conclusion, and its logical deduction from the assumed premiss, do not prove that premiss to be true, even where they justify its character as a valuable working hypothesis, which may be allowed to pass current, until some facts hitherto unobserved put an end to its claim to truth.

## CHAPTER II.

### THE SYLLOGISM AND ITS LAWS.

Syllogism the type of Reasoning—Terms and Premisses—Order of Premisses—Principles of Syllogism—Dictum de omni et nullo—General Laws of the Syllogism—Illicit Process—Undistributed Middle—One Premiss affirmative—One Premiss universal.

THE Syllogism is the principal type of reasoning to which all others may be reduced. It may be defined as a form of reasoning or argument in which two ideas are compared together through the medium of a third, and their mutual agreement or difference deduced therefrom. Or it may be defined as a form of reasoning or argument consisting of three propositions so related to one another that two of them being laid down, the third necessarily follows from it. The first of these definitions refers to the Syllogism primarily as a mental act, the latter to the external expression of that act.

Hence we have in every syllogism three terms and three propositions.

When the three terms of a syllogism are all of them categorical propositions, the syllogism is said to be a *categorical simple* one. If any of them are hypothetical or complex, the syllogism is said to be a *hypothetical* or *compound* syllogism as the case may

be. We shall at present speak only of the Simple Syllogism.

The three terms (*termini*, *ἄκρα*) are called the *major*, *middle*, and *minor*. The *major* term (*ἄκρον τὸ μεῖζον*) is that which forms the predicate of the conclusion. The *minor* term (*ἄκρον τὸ ἔλαττον*) is that which forms the subject of the conclusion. The idea expressed in the *major* term is compared with the idea expressed in the minor term through the medium of the *middle* term.

Every Syllogism also contains three popositions, called respectively the *major premiss*, the *minor premiss*, and the *conclusion*. The major premiss (*propositio*, or *sumptio major*, *πρότασις ἡ μείζων*) is that premiss in which the major term is compared with the middle term. The minor premiss (*propositio or sumptio minor*, or *altera*, *πρότασις ἡ ἐλάττων*) is that premiss in which the minor term is compared with the middle. The conclusion (*conclusio*, *illatio*, *συμπέρασμα*) is the final proposition which declares the relation between the major and the minor term resulting from their several comparison with the middle term. It is introduced by the word *Therefore*, or *Ergo*, and announces the inference drawn from the premisses.

The two premisses combined are called the *antecedent*. The conclusion is the *consequent* therefrom.

Middle term. Major term.
*All jewels are mineral substances* (major premiss).
Minor term. Middle term.
*All diamonds are jewels* . . (minor premiss).
∴ *All diamonds are mineral substances* (conclusion).

The reader must be careful to notice that the major premiss is not necessarily the premiss which comes first. The order is very often inverted in an argument, and the minor premiss placed first. The major premiss is invariably the premiss in which the major term is to be found; the minor premiss that in which the minor term is to be found. Thus in the syllogism:

*All ostriches have good digestion,*
*All animals with good digestion live long lives,*
∴ *All ostriches live long lives,*

the minor premiss comes first, since it contains the minor term *ostriches.*

What are the common principles on which the Syllogism is based?

CANONS OF THE SYLLOGISM.—If we look at the material structure of the Syllogism as composed of three terms, we shall find that it is based on two principles.

1. *Things which are identical with one and the same thing are identical with one another.* This is the principle of all Affirmative Syllogisms. The major and minor term are identical with the middle, and therefore are identical with each other.

2. *When of two things one is identical with and the other different from some one and the same third thing, these two things are different from each other.* This is the principle of all Negative Syllogisms. Of the major and minor terms one is identical with, the other different from, the middle term, and therefore they are different from each other.

But we may regard the Syllogism under another light, viz., as an argument that descends from the universal to the particular, from a wider to a narrower object of thought. Looked at under this aspect it is based on a principle known to ancient logicians as the *Dictum de omni et nullo.*[1]

DICTUM DE OMNI ET NULLO. — *Whatever is necessarily affirmed or denied of a universal subject may be affirmed or denied of each of the particulars contained under that subject.*

*The Dictum de omni et nullo* is applicable to deductive reasoning only. The two principles previously given include inductive reasoning as well, when expressed in syllogistic form.

Some moderns have attacked the *Dictum de omni et nullo* as a high-sounding truism. This is no ground for assailing it. A principle underlying all *a priori* reasoning must be one which is familiar to all beings who reason. The more universal a truth, the more it partakes of the nature of a truism. There is no principle more familiar than that which asserts the incompatibility of contradictories; yet this is the foundation of all possible thought. To call a familiar truth a truism is to disparage it with an ill-sounding title. It deserves the name only when it is announced as some wonderful discovery or recondite principle, which is to shed fresh light on human knowledge.

GENERAL RULES OF THE SYLLOGISM. — The Rules of the Syllogism arise from its very nature as

[1] This dictum is derived from Aristotle. *Anal. Pr.*, I. 4.

laid down in the canons or principles which we have stated as the foundation on which it is based.

Rule 1. *There must be three terms, and three only.*

In the Syllogism the two extremes (the major and minor term) are compared with the middle term, in order that their mutual identity or diversity may be thus affirmed or denied. If there were no third term there would be nothing to act as a medium or middle term, by means of which the extremes might be compared together. If there were more than three terms there would be not one middle term, but several, and consequently no common chain to bind together or sever asunder the major and minor.

Here we must bear in mind, that when we say that there must be *one* middle term, we mean one in meaning, not in words only, as when we say:

*All pages wear the livery of their masters.*
*The component parts of a book are pages;*
∴ *The component parts of a book wear the livery of their masters.*

Rule 2. *No term must have greater extension in the conclusion than it has in the premisses.*

If any term is used in its full extension in the conclusion without being used in its full extension in the premiss, the inference would be one that the premisses would not justify, for we cannot argue from a part of the extension to the whole. The breach of this rule is called an *illicit process* or

unlawful proceeding of the major or minor term, as the case may be. For instance, if I argue:

*All sheep are graminivorous,*
*But horses are not sheep,*
∴ *Horses are not graminivorous,*

my argument is faulty in that in the conclusion I speak of the whole of the class of graminivorous, and exclude horses from it; whereas in the major premiss I am speaking of only a portion of the class. In Logical language the predicate of the negative conclusion is distributed, the predicate of the affirmative major is undistributed, and we therefore have an illicit process of the major. Or again, if the rigorous moralist argues,

*All occasions of sin are to be avoided;*
*Card-playing is an occasion of sin,*
∴ *Card-playing is to be avoided,*

I remind him that he is using in the conclusion the word card-playing in its full extension, whereas the minor is only true of some card-playing, of card-playing when the stakes are high, of card-playing that occupies time that ought to be spent in serious pursuits, of card-playing in dangerous company, &c., and that he is therefore violating this second rule of a good syllogism, and is guilty of an illicit process of the minor.

Rule 3. *The middle term must not be found in the conclusion.*

The business of the middle term is to be the medium through which the major and middle terms are compared with the other. This office is per-

formed in the premisses; after which its work is done, and it gracefully retires. If I were to argue as follows:

*All great orators are men of genius;*
*Cicero and Demosthenes were great orators,*
∴ *The genius of Cicero and Demosthenes consisted in their powers of oratory,*

the middle term *great orators* would thrust itself unbidden into the conclusion and render the whole syllogism futile.

Rule 4. *The middle term must be distributed* (*i.e.*, used to the full extent of its significance), *at least once in the premisses.*

The reason of this rule is the fact that the major and minor terms are compared together through the medium of the middle term. Now if in each of the premisses we spoke only of a part of the subject that forms the middle term, the two parts might be entirely different, and there would then be no common term with which the extremes are compared, *e.g.*,

*Some learned men are unbelievers;*
*But the Doctors of the Church are learned men,*
∴ *The Doctors of the Church are unbelievers,*

where it is evident that the section of learned men who are unbelievers is entirely different from the section who are Doctors of the Church.

This rule should teach us to look very carefully to the universality of the middle term when it stands as the subject of the major premiss, else from a statement generally, but not universally true, we

are likely to draw a conclusion which is at variance with facts, *e.g.*,

*The Rulers of the Jews were enemies of Jesus Christ,*
*But Nicodemus was a Ruler of the Jews,*
∴ *Nicodemus was an enemy of Jesus Christ.*

These first four rules affect the terms of the Syllogism, the next four affect the premisses or the propositions that compose it.

Rule 5. *From two negative premisses no conclusion can be drawn.*

Unless one of the premisses be affirmative, neither of the extremes agrees with the middle term, but they both of them are at variance with it. But from the fact that two things are both of them different from a third, we gain no information as to their mutual relations to one another. For instance, from the premisses,

*No shoemakers are astronomers,*
*But some astronomers are not classical scholars,*

we learn nothing as to the connection between shoemakers and classical scholarship. As far as the above premisses are concerned, all classical scholars may be shoemakers, or none may be; or some may be and others not. Sometimes syllogisms with this defect seem to justify an inference, *e.g.*,

*No tyrants are friends to liberty,*
*But some statesmen are not friends to liberty.*

At first sight it looks as if we could draw the conclusion,

∴ *Some statesmen are tyrants;*

but the fact that all tyrants as well as some states-

men are excluded from the class of friends of liberty really proves nothing as to their mutual relation to one another.

Rule 6. *From two affirmative premisses a negative conclusion cannot be drawn.*

For if both of the premisses are affirmative, each of them declares one of the extremes to be in agreement with the middle term, and therefore by the first of the principles given above they will necessarily agree with each other, and the conclusion must be affirmative. If for instance I were to argue that

*All lemons are sour,*
*Some ripe fruits are lemons,*

and were to draw the conclusion that

*Some ripe fruits are not sour,*

it is clear that, however true the statement, it is one which is not justified by the premisses.

Rule 7. *No conclusion can be drawn from two particular premisses.*

1. Let us suppose that both premisses are affirmative; then the middle term is not distributed in either premiss. This is in contradiction to Rule 4.

For instance, from the premisses:

*Some cab-drivers are deficient in politeness,*
*Some gentlemen are cab-drivers,*

it would be very injust to infer anything disparaging the politeness of gentlemen.

2. Let us suppose one of the premisses to be negative and the other affirmative. In this case

in order that the middle term should be distributed it must be the predicate of the negative premiss, for this is the only term distributed in the premisses. But as one of the premisses is negative the conclusion must be negative, and its predicate, *i.e.*, the major term, will be distributed. But the major term was not distributed in the major premiss, and we have therefore here an illicit process of the major in opposition to Rule 2, *e.g.*,

*Some buffaloes are fierce,*
*Some tigers are not buffaloes,*
∴ *Some tigers are not fierce,*

where the major term *fierce* is distributed in the conclusion and not in the major premiss.

Rule 8. *The conclusion must follow the weaker premiss, i.e.*, it must be particular if either of the premisses is particular, negative if either of the premisses is negative.

(*a*) It must be particular if either of the premisses is particular, for the particular premiss asserts the agreement or disagreement of the middle term with one of the terms taken in a restricted and not in a universal sense, taken in part and not as a whole.

Thus in the syllogism:

*All swans are said to sing before they die,*
*Some waterfowl are swans,*
∴ *All waterfowl are said to sing before they die,*

this rule is clearly violated, and we have an illicit process of the minor.

(*b*) It must be negative if either premiss is negative, because the negative premiss states the

disagreement of one of the extremes from the middle term, while the affirmative premiss states the agreement of the other extreme with it. Hence the conclusion must assert the disagreement of the two extremes from each other. If for instance I argue,

*No private persons wear uniform,*
*All Policemen wear uniform,*
∴ *All Policemen are private persons,*

the violation of right reason is patent.

## CHAPTER III.

### THE FIGURES OF THE SYLLOGISM. REDUCTION.

What determines the Figures of the Syllogism--Principle of the First Figure—Origin of the Second, Third, and Fourth Figures—Principle of the various Figures—First Figure type of reasoning—Rules of the Figures—Fourth Figure anomalous—Rules of Fourth Figure—Principle of Reduction—Importance of First Figure—Method of Reduction—Reduction *per impossibile*—Reduction *per contra*—Clumsiness of Reduction *per contra*—Singular Propositions in the Syllogism.

In discussing the Syllogism, we explained that it consists of three terms and three propositions, and that it is governed by certain Laws or Rules, the observance of which is necessary to its validity. Every Syllogism, moreover, is subject to special rules according to its *Form* or *Figure*.

The Figure of a Syllogism is determined by the position of the middle term with respect to the extremes. Its normal place, as the middle term, is between the two extremes, since it is less in extent than the major term, but greater than the minor. This will place it as the subject of the major premiss, in which it is compared with the major term, and the predicate of the minor premiss, in which it is compared with the minor term. For instance:

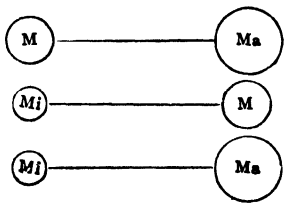
*All courteous men are gentle in words;*
*All well-bred men are courteous;*
∴ *All well-bred men are gentle in words,*

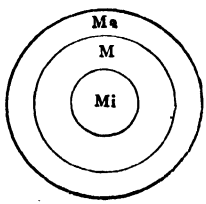
where the middle term, *courteous*, comes in point of extension between the major *gentle in words* and the minor *well-bred*.

This is the normal and most perfect form of the Syllogism. It is the only one which gives a scientific knowledge of the nature of things. It is the type and model of all reasoning, the shape into which it naturally and easily falls. It is the only figure by which Demonstration properly so called can be carried on: the only one which carries out the Aristotelian method of argument from *a priori* principles.

When the middle occupies this position, we have what is called the First Figure. Hence the First Figure is the ideal form of reasoning, the pattern of all argument; it is the scientific figure, the only figure that leads up to a conclusion at the same time universal and affirmative.

I. The First Figure, then, is that form of the syllogism in which the middle term is the subject of the major premiss and the predicate of the minor. It may be depicted as follows:




when Ma=major term, M=middle, Mi=minor.

II. But the middle term may fail of this relation

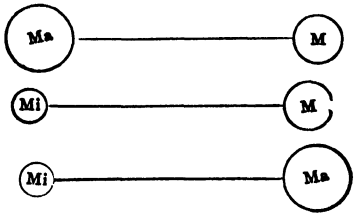
in point of extension to the major and minor, and yet may truly remain the middle term. For if one of the premisses is negative, thus excluding the middle term from one of the extremes, it is not necessary that it should occupy this middle position between the extremes. In the affirmative premiss the middle term must occupy its proper place as less extended than the major or more extended than the minor term; but in the negative premiss which asserts the mutual exclusion of the middle and one of the extremes, it is not necessary that we should take into account the relation, in point of extension, of the middle term and the extreme from which it is thus excluded. For instance,

*No gouty men are centenarians,*
*All the Patriarchs before the Flood were centenarians,*
∴ *None of the Patriarchs before the Flood were gouty men,*

where the middle term (*centenarians*) in the affirmative minor is more extended than the minor term (*patriarchs*) but it is not necessarily less extended than the major term (*gouty men*) in the negative major premiss.

Hence it is not always necessary to look to the extension of the middle term with regard to both the extremes, and we may have other figures different from the first and in which the middle premiss may occupy a position other than that of the subject of the major premiss and predicate of the minor. In the instance just given it is the predicate of both premisses, and the syllogism is said to be in the Second Figure.

The Second Figure may be thus represented:




III. Beside the case of one of the premisses being negative, there is another in which without anomaly the middle term need not be placed between the extremes. If in one of the premisses we speak only of a *part* of the extension of the middle term, and in the other of the *whole* of it, the middle term may in its partial signification be less than either of the extremes without violating syllogistic principles. This always leaves the possibility that in its universal meaning and as a whole it is greater than the minor term; for instance,

*All men are prone to err,*
*Some men are Doctors of Divinity,*
∴ *Some Doctors of Divinity are prone to err,*

where the middle term *men*, though greater in its full extension than the minor term *Doctors of Divinity*, is not necessarily so when restricted by the limiting word *some*, and therefore can take its place as the subject of the minor premiss.

Even if in point of fact the middle term, taken as a whole, is less than the minor in extension, yet as we cannot, in the case we are considering, know this from the form of the syllogism, it does not

violate the principle we have laid down respecting its position, *e.g.*, if instead of the above we had,

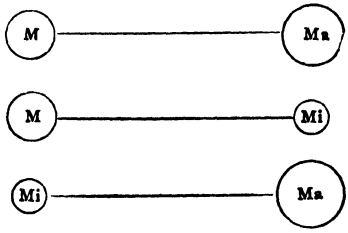
*All men are prone to err;*
*Some men are animals of a savage nature;*
∴ *Some animals who have a savage nature are prone to err.*

It is clear that there are more savage animals than there are men, yet this does not appear from the form of the syllogism, and therefore there is no real anomaly in the minor premiss.

But we may go beyond this. Even though in the minor premiss the middle term is in the entirety of its extension put under the minor, yet if in the conclusion we speak only of a portion of the extension of the minor term, our syllogism may still pass current, because the portion of the minor term spoken of in the conclusion may be less in extension than the middle term taken in its entirety in the minor premiss, as for instance:

*All civilized men wear clothes,*
*All civilized men cook their food,*
∴ *Some who cook their food wear clothes,*

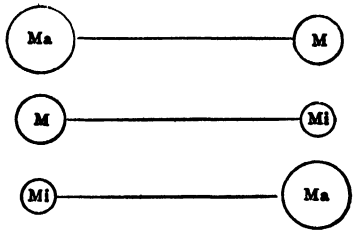
where we speak in the conclusion of only a portion of those who cook their food, and as far as the form of the syllogism is concerned, the general class of civilized men may come between the class of food-cookers and the class of clothes-wearers in point of extension. In these instances the middle term is the subject of both premisses, and the syllogism is said to be in the Third Figure, of which our diagram will be:




IV. Can we go further still, and suppose a case in which in the major premiss the middle can occupy the anomalous position of predicate, and therefore appear as greater than the major term, and the minor premiss the anomalous position of subject appearing therefore as less than the minor term? This can be done if in the conclusion we reverse the natural order of things, and subordinate the subject which possesses the larger extension to the subject which possesses the lesser extension, *e.g.*,

*All Frenchmen are civilized,*
*All civilized men are courteous,*
∴ *Some courteous beings are Frenchmen.*

Here the largest class is the minor term, the smallest the major term, and the middle is larger than the major, smaller than the minor. The anomaly is only explicable by the fact that we speak in the conclusion only of such a portion of the class of largest extension as can come under the class of smallest extension. This anomalous arrangement gives us the Fourth Figure. Its symbol will be:




We now turn from theory to practice. We have seen that though the middle term, normally and in the scientific form of the Syllogism, is a class which should in its entirety be greater in extension than the minor term taken in its entirety, and less than the major term taken in its entirety, yet that when we exclude one class from another we need take no notice of their mutual relation in point of extension. The same is the case when we speak of a portion and not of the whole of the minor term in the conclusion. In other words, provided that our conclusion is either negative or particular, we can depart from the first figure and may place our middle term in the various possible positions that any term which comes twice in the premisses can occupy. By this method we shall thus arrive at four figures.

I. First Figure.—Middle term the subject of the major premiss, predicate of the minor.

II. Second Figure.—Middle term the predicate of both premisses.

III. Third Figure.—Middle term the subject of both premisses.

IV. Fourth Figure.—Middle term the predicate of the major premiss, subject of the minor.

We have already spoken of the First Figure as the type and model of all reasoning. This is so much the case that arguments in the other figures are valid only so far as they are reducible to sound arguments in the first figure. It is moreover the shape into which every argument naturally falls, and if we depart from it and employ other figures in its place, it is more because there is a certain convenience in their adoption than because they are a necessity. The author of the work on the Logic of Aristotle found among the Opuscula of St. Thomas,[1] remarks that the First Figure is the most perfect because in it alone the middle term is really the middle, and partakes of the nature of the two extremes, inasmuch as it is the subject of the major term, the predicate of the minor. If however, continues this author, the middle terms is the predicate of both premisses, the middle term, though it departs from its proper place, holds as predicate of both premisses a more dignified position than if it were the subject of both; if however it is the subject of both,

[1] *De Totius Logicæ Aristotelis Summa*, Tractat. de Syllogismo, c. 4, p. 128. "Si enim medium in una propositione subjicitur et in altera prædicatur, dicitur esse prima figura; et merito, quia tunc medium vere est medium, quia sapit naturam utriusque extremi, scilicet subjecti et prædicati: prædicatur enim et subjicitur, ut dictum est. Si vero medium in utraque propositione prædicatur, dicitur esse secunda figura: quia licet medium non sit vere medium sapiens naturam subjectionis et prædicationis, tamen quia dignius est prædicari quam subjici, ideo hac figura secundum locum tenet. Si vero medium in utraque propositione subjicitur, dicitur tertia figura et ultima, quia in ea medium non stat in medio sicut in prima et subjicitur semper, quod est indignius. Plures figuræ non possunt esse, quia tres termini in duabus propositionibus non possunt pluries variari."

it neither holds its proper position nor the dignified place of predicate, but is subject in each, and therefore this figure is the third and last. The Fourth Figure this author does not recognize at all. We shall presently see the reason of the omission. It is enough to say here that the poor middle term is in it thrust into an utterly false position, inasmuch as it is subject in the premiss where properly speaking it ought to be predicate, and predicate where it ought to be subject.

RULES OF THE FIRST FIGURE.—The very nature of the First Figure is to apply a general law to a particular case. From this it follows:

1. That the major premiss which states the law should be universal.

2. That the minor premiss which applies the law should be affirmative.

These two conditions exclude from the first figure a number of combinations of various kinds of propositions. The major premiss must be A or E, the minor A or I. The conclusion must be negative if there be a negative premiss, and particular if one of the premisses be particular. This reduces the various moods or combinations possible under Fig. 1 to 7, viz., AAA, EAE, AII, EIO, AAI, EAO, of which the last two are only weakened forms of the first two. These four moods are summed up in the mnemonic line,

BARBARA, CELARENT, DARII, FERIOQUE, prioris.[1]

[1] The capitals in this line indicate the nature of the propositions in the various moods. The small letters in Figure 1 have no special meaning.

If we violate either of the above rules, or attempt any other combination in the first figure, our argument will be faulty, and will sin against one or other of the general rules given above. For instance, let us try a syllogism with a particular major premiss,

*Some Africans have woolly heads;*
*All Egyptians are Africans;*
∴ *All Egyptians have woolly heads.*

Here the middle term is not distributed in either premiss.

Or suppose we attempt a negative minor,

*All great talkers are wearisome to their friends;*
*No silent men are great talkers;*
∴ *No silent men are wearisome to their friends.*

Here *wearisome* is distributed in the conclusion, but not in the major premiss (illicit major).

Lastly we will take both faults together.

*Some sweetmeats are unwholesome;*
*No beverages are sweetmeats;*
∴ *No beverages are unwholesome.*

Here *unwholesome* is distributed in the conclusion, but not in the major premiss (illicit major).

RULES OF THE SECOND FIGURE.—The Second Figure, as we have seen, arises from the fact that when the middle term is the predicate of a negative proposition, we need not take into account its extension as compared with the major and minor. The Second Figure always has one of its premisses negative, either deriving from a law of universal exclusion, the exclusion of some subordinate class (major negative), or, arguing from a positive law universally

applied to some class, the exclusion of a subordinate class from the larger class by reason of its exclusion from the jurisdiction of the universal law (minor negative). Hence follow the Rules of Figure 2.

1. The major must be universal.
2. One premiss must be negative.
3. The conclusion must be negative.

This limits the possible moods of this figure to four, viz., EAE, AEE, EIO, AOO, which are commemorated in the mnemonic line,

CESARE, CAMESTRES, FESTINO, BAROKO, secundæ.

Break either of the above rules and you will find yourself with some syllogistic defect, *e.g.*,

*Some pagans are virtuous;*
*No housebreakers are virtuous;*
∴ *Some housebreakers are not pagans* (illicit major).

*All sparrows are impudent;*
*Some schoolboys are impudent;*
∴ *Some schoolboys are sparrows* (undistributed middle)

RULES OF THE THIRD FIGURE.—The Third Figure is based on the consideration that when in the conclusion we speak only of a portion of the minor term, it does not follow that the middle term should be greater in extension than the whole of the minor term, as is required if the whole of the minor term occupies the subject of the conclusion. In this Figure therefore the rules will be,

1. The conclusion must be particular.
2. The minor premiss must be affirmative, else we shall find ourselves involved in an illicit major.

This reduces our possible moods to six: AAI, IAI, AII, EAO, OAO, EIO, or rhythmically.

Tertia DARAPTI, DISAMIS, DATISI, FELAPTON, BOKARDO, FERISON, habet.

Here, too, any attempt to construct syllogisms other than these will be fatal to right reasoning, *e.g.*,

*All oysters are nutritious;*
*No oysters are in season in July;*
∴ *Nothing in season in July is nutritious* (illicit major).

or, *No mosquitoes are pleasant companions;*
*All mosquitoes buzz;*
∴ *No buzzing things are pleasant companions* (illicit minor).

RULES OF THE FOURTH FIGURE.—We now come to that *mauvais sujet* of syllogistic reasoning, the Fourth Figure, in which, contrary to all symmetry and to the very nature of things, the middle term occupies the doubly anomalous position of being the predicate of the major term where it ought to be subject, and subject of the minor where it ought to be predicate.

Is it based on any principle? Can any excuse be found for it? We have already mentioned that all that can be said in its favour is that, whereas in the legitimate syllogism the class smallest in extension is in the conclusion included in the largest, because included in the one which occupies the middle term between them, in this bastard offspring of syllogistic reasoning a bit of the largest class is included

in the smallest because it is included in that bit of the middle which is included in the smallest.

It has its origin in what are called the indirect moods of the First Figure, viz., those in which the conclusion is inverted, the subject being taken from the major premiss and the predicate from the minor, *e.g.*,

*Some fishes fly* . . . . . I
*No birds are fishes* . . . . . E
∴ *Some creatures that fly are not birds* . O

There are five of these moods, viz: AAI, EAE, AII, AEO, IEO, given in the line,

BaraIip, CeIantes, DabItis, FapEsmo, FrisEsmo

They are anomalous but perfectly valid as arguments. The Fourth Figure is an attempt to arrange them under some principle, and to make a home for them. Is this necessary? No. It is much better that these anomalous moods should return to their allegiance and be retained as syllogistic curiosities. They are one and all reducible to the ordinary moods of Figure I; to provide them with a dwelling-place of their own is to encourage the grossest syllogistic irregularity.

Is the Fourth Figure of any practical use? Not a bit. Does syllogistic reasoning ever fall naturally into it? Never. What is it then? Nothing else than the First Figure turned upside down. It is a mere mechanical invention of those who arrange the figures according to the possible position of the middle term in the premisses, without having any regard to its due relation to the major and minor in

extension. "Its conclusions," says Goudin, "are true; but it arrives at them in an inordinate and violent fashion (*violente admodum et inordinate*), upsetting the arrangement of the terms of the conclusion."

Ought we to retain it? If we do, it should be as a sort of syllogistic Helot, to show how low the syllogism can fall when it neglects the laws on which all true reasoning is founded, and to exhibit it in the most degraded form which it can assume without being positively vicious.

Is it capable of reformation? Not of reformation, but of extinction. It is absolutely unnecessary, and the best thing it can do is to transfer whatever rights or privileges it may possess to the First Figure, which does all the work that it can do in far better fashion than itself.

What then is the Fourth Figure? Simply the First with the major and minor premisses inverted and the conclusion weakened by conversion. Where the same premisses in the First Figure would prove a universal affirmative, this feeble caricature of it is content with a particular; where the First Figure draws its conclusion naturally and in accordance with the forms into which human thought instinctively shapes itself, this perverted abortion forces the mind to an awkward and clumsy process which rightly deserves to be called "inordinate and violent." For instance, in the First Figure I have the following syllogism:

*All birds can fly;*
*All ostriches are birds;*
∴ *All ostriches can fly.*

In Figure 4 this syllogism will be as follows:

*All ostriches are birds;*
*All birds can fly;*
∴ *Some things that can fly are ostriches.*

Or again:

*No good men are unmerciful to the poor;*
*Some police magistrates are good men;*
∴ *Some police magistrates are not unmerciful to the poor.*

When this is stated in Figure 4 it will run thus:

*Some police magistrates are good men;*
*No good men are unmerciful to the poor;*
∴ *Some who are not unmerciful to the poor are police magistrates.*

But we must turn to the Rules of this poor mis-shapen figure; they are three in number.

1. If the major is affirmative, the minor must be universal, else the middle term will not be distributed in either premiss.

2. If the minor is affirmative, the conclusion must be particular, else illicit minor.

3. If one premiss is negative, the major must be universal, because the negative conclusion which is the result of a negative premiss will distribute the major term.

Hence the legitimate moods of the Fourth Figure will be AAI, AEE, IAI, EAO, EIO, commemorated in the line—

BRAMANTIP CAMENES, DIMARIS, FESAPO FRESISON.

We need not linger over instances of this figure.

It is not worthy of our consideration. It is not recognized by Aristotle or by the scholastic logicians. It is the invention of Galen, the physician, who lived towards the end of the second century, and was termed by his contemporaries *Paradoxologos* or the wonder-talker. Hence it is sometimes called the *Galenian* figure.

REDUCTION.—If the First Figure is the type and pattern of all reasoning, it will be necessary, or at least desirable, that all the various forms of lawful argument should be reducible to it. If the *Dictum de omni et nullo* is the basis of the Syllogism, it must be the test of all good Syllogisms, that we should be able to arrange them under that figure to which alone the Dictum is applicable. Nay more, it is only to those moods of the First Figure which have a universal conclusion that this dictum is strictly and properly applicable, and Aristotle[1] is not satisfied until he has reduced, in the way that we shall presently describe, all other syllogisms whatever to a form which enables them to come, directly or indirectly, under this fundamental principle of all reasoning. Modern philosophers, impatient of the elaborate process required for this universal reduction, would

[1] Cf. St. Thos., Opusc., XLIV. (Ed. Rom. xlviii.), *De Totius Logicæ Aristotelis Summa*, c. 4. "Sciendum quod licet isti duo ultimi syllogismi probari possint per dici de omni et per dici de nullo, ut dictum est; tamen Philosophus I Prior., reducit eos ad duos modos primos in quibus verius salvatur dici de omni et dici de nullo propter universalitatem minoris propositionis eorum et hoc faciemus in fine omnium."

have each figure to stand on its own basis, and each mood to be proveable by the two principles which we have given above.

At the same time they do not deny the fact that any valid argument may be stated in some way or other under the First Figure, and each proved indirectly, if not directly, by Barbara or Celarent; to the exclusion of all other forms of reasoning. We will first give the laws of Reduction as generally laid down by modern logicians, and will afterwards compare the ancient and modern methods of Reduction, and see whether it is desirable or not to improve upon Aristotle and St. Thomas.

We have given certain mnemonic words for the various moods of the different figures. We will combine them here into a convenient little stave which it is well to commit to memory,

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.

Here it will be noticed that all the various forms begin with one of the four letters, B, C, D, F, corresponding to the various moods of Figure 1. This indicates the mood in Figure 1, to which the moods of the other figures are reducible; Baroko, for instance, to Barbara, Cesare to Celarent. We also observe certain letters recurring which point out the changes necessary for effecting this reduction. The letter *m* directs that the premisses

should be transposed, while *s*, *p*, *k* that the proposition which they follow is to be converted, and indicate the kind of conversion to be employed. When *s* is found following a letter, the proposition indicated by the preceding letter must be converted simply; *p* in the same way indicates that the proposition indicated by the preceding letter should be converted *per accidens*. Thus Camestres in Figure 2 must be converted to Celarent, because both begin with C: the premisses, moreover, have to be transposed (*m*), and the minor premiss and conclusion to be simply converted (*s*). For instance,

| | |
|---|---|
| *All fishes breathe by gills* . . . . | cAm |
| *No porpoises breathe by gills*. . . . | ES |
| ∴ *No porpoises are fishes* . . . . | trES |

becomes when reduced

| | |
|---|---|
| *No creatures breathing by gills are porpoises* . | CE |
| *All fishes breathe by gills* . . . . | lA |
| ∴ *No fishes are porpoises* . . . . | rEnt |

Again Darapti in Figure 3, which only contains one of the four magic letters needs only one change, the *p* indicating that the minor premiss must be converted *per accidens*, *e.g.*,

| | |
|---|---|
| *All lobsters turn red when boiled* . . . | DA |
| *All lobsters are good for food* . . . | rAp |
| ∴ *Some creatures good for food turn red when boiled.* | tI |

becomes

| | |
|---|---|
| *All lobsters turn red when boiled* . . . | DA |
| *Some creatures good for food are lobsters* . | rI |
| ∴ *Some creatures good for food turn red when boiled* | I |

But what is the meaning of *k*? According to the old logicians it indicated that the reduction employed must be of an indirect kind called *per impossibile;* according to moderns it indicates that the proposition indicated by the preceding letter is to be converted by *contraposition* or *per contra.*

We have already remarked [1] that conversion *per contra* is not really conversion at all, but the conversion of some proposition equivalent to the proposition to be converted. For this reason it is ignored by Aristotle and scholastic logicians. Hence in Reduction they make no use of any such process, but adopt the more strictly scientific, though perhaps rather cumbersome process which is termed *Reductio per impossibile.* The reader is requested to recall the system of proof occasionally adopted in Euclid of assuming the contradictory of the conclusion which is to be proved, and showing how this contradictory is false, and therefore the original conclusion true. The process of the logician is almost exactly similar; it is as follows:

If we suppose that the conclusion of our syllogism is false, its contradictory must be true. We will therefore assume this contradictory for a new premiss to be combined with one of the original premisses, and see what new conclusion we thence deduce. For instance, I take a syllogism in Baroko (Fig. 2).

| | |
|---|---|
| *All angels are perfectly happy* . . | BA |
| *Some intellectual beings are not happy* . | rok |
| ∴ *Some intellectual beings are not angels* . | O |

[1] P. 302.

If the conclusion is false, its contradictory will be true, viz.,

*All intellectual beings are angels.*

We will therefore assume this as our new premiss. Retaining our old major premiss, we will take this as our new minor: our argument will then be as follows:

| | |
|---|---|
| *All angels are perfectly happy* . . | BA |
| *All intellectual beings are angels* . . | rbA |
| ∴ *All intellectual beings are perfectly happy* | rA |

But this new conclusion contradicts our former minor premiss, and must therefore be false. Hence one of our new premisses must be false; it cannot be our new major premiss, which remains the same as before. Hence our new minor premiss, viz.,

*All intellectual beings are angels,*

is false, and therefore its contradictory,

*Some intellectual beings are not angels,*

or our original conclusion, is true.

So far the ancient method. We will now turn to the light and airy method which moderns substitute for the system of Aristotle and St. Thomas. Instead of reducing Baroko and Bokardo *per impossibile,* they make use of conversion *per contra* or by contraposition, and reduce these moods to Ferio and Darii respectively. If conversion *per contra* is no conversion at all, Reduction *per contra* is of all methods of Reduction the clumsiest. We will take the instance of Baroko already cited.

*All angels are happy* . . . BA
*Some intellectual beings are not happy* rok
∴ *Some intellectual beings are not angels* O

The modern plan is to attach the negative to the predicate in the minor premiss and in the conclusion.

*All angels are happy* . . . . A
*Some intellectual beings are not-happy* . I
∴ *Some intellectual beings are not-angels* . I

This, however, involves us in a fresh difficulty, which we must remedy before we go further. We have altered one of our terms from a definite term (*happy*) to its contradictory (*not-happy*). We must therefore manage to foist a similar term into the major premiss, and for this purpose we must introduce a double negative, and for our old major, *All angels are happy*, we must substitute a new negative major, *No angels are not happy*. Our new syllogism will now be,

*No angels are not-happy* . . . E
*Some intellectual beings are not-happy* . I
∴ *Some intellectual beings are not angels* . O

But in order to reduce it to Figure I we must convert the major premiss,

*No not-happy beings are angels* . . FE
*Some intellectual beings are not-happy* . rI
∴ *Some intellectual beings are not angels* . O

Whether this process is a satisfactory one we leave our readers to judge. Suffice it to remark that it does not deserve the name of Reduction at

all. It is simply a clumsy and mechanical manipulation of words which makes nonsense and proves nothing, and is, moreover, liable to lead into error, inasmuch as it tends to introduce a confusion of thought between contrary and contradictory terms, between *unhappy* and *not-happy*.

*Bokardo* in Figure 3 may be similarly manipulated, though here the double negative is not necessary in the universal premiss, but only the conversion *per contra* of the major and the conclusion and the transposition of the premisses. Thus:

*Some philosophers are not polite* . . . BOk
*All philosophers are rational beings* . Ar
∴ *Some rational beings are not polite* . . dO

becomes

*All philosophers are rational* . . . DA
*Some beings who are not-polite are philosophers* rI
∴ *Some beings who are not-polite are rational* . I

Hence Baroko and Bokardo assume in our modern books the new titles of Fakoro and Dokamok, on account of their being thus reduced to Ferio and Darii respectively.

This mode of Reduction, if Reduction it can be called, is useful only as a sort of mental gymnastic to try the versatility and skill of learners. As a proof of the correctness of the original argument it is valueless, and since this is the chief, if not the only end of Reduction, it loses all its point and force as an instrument for establishing the validity of the reasoning employed in the syllogisms with which it deals.

Before we close the subject of Reduction there is one question to which it is necessary briefly to recur. We laid down above that Singular Propositions are to be treated as Particulars, that the proposition, *This parrot is a good talker*, is a still more restricted form of the proposition, *Some parrots are good talkers.* But when we come to deal with certain Singular Propositions in the Syllogism, we are met by the fact that in some cases we may treat them as Universals without endangering the legitimacy of our inference, *e.g.*,

*Julius Cæsar was a skilful general,*
*Julius Cæsar was a Roman Emperor;*
∴ *One of the Roman Emperors was a skilful general.*

We shall not have any difficulty in solving this difficulty when we recall what was said on pp. 282, seqq., respecting the Import of propositions. We advert primarily not to the extension, but the comprehension of the subject of a proposition, to the nature it expresses, not the class over which it is spread. The name of an individual, like every other name, stands for a certain nature endowed with certain attributes and gifts, essential and accidental. It is perfectly true that in respect of the *quantity* of the proposition in which it stands, the individual proper name, as more restricted than any portion of the class containing more individuals than one, should be treated as a Particular. But by reason of its expressing a nature which cannot be communicated to any one save to him who possesses it, it shares the nature of the Universal, in that it stands

for the whole of that to which the name is applicable, even though that whole is more limited than any portion of a class. Julius Cæsar was but a single individual, and therefore in point of extension more restricted than any portion of a class consisting of more than one, but it is because he is a single individual, and has his own individual nature all to himself, that he shares the privileges of the Universal. When we speak of *some* members of a class in one of the premisses, and of *some* members also in the other, it is always possible that I may be speaking of groups altogether different. This cannot be so when I speak of one individual, and only one. As all men exhaust the nature found in man, so Julius Cæsar has all to himself the nature which his name suggests. It is just the same in a Singular Proposition where there is a limiting word such as *this*, or some expression which limits the subject to a single individual, as, *The last of the Roman kings; The youngest of the children of Darius;* where the whole expression stands for a nature which in point of fact admits of no repetition by reason of the individualizing word joined to it.

In all these cases the singular may be treated as a Universal, and from two singular Propositions a legitimate conclusion may be deduced, whereas from two particular Propositions no inference can be made.

# CHAPTER IV.

## VARIOUS KINDS OF SYLLOGISMS.

Hypothetical Syllogisms—1. Conditional Hypotheticals—2. Disjunctive Hypotheticals—3. Conjunctive Hypotheticals—4. The Dilemma—Rules of the Dilemma—The Enthymeme—True nature of the Enthymeme—The Epichirem—Sorites—Rules of Sorites—The Polysyllogism.

IN our last chapter we discussed the various Figures of the Syllogism, and the rules that govern them. We said that the Fourth Figure is but a clumsy and useless distortion of the First, and not recognized by ancient logicians. We then explained the pre-eminence of the First Figure, and the consequent necessity of reducing the mood of the other Figures to it. We now come to the various kinds of Syllogisms.

All Syllogisms are either simple or compound, categorical or hypothetical. They are, as we have already remarked, Categorical or simple when they consist of three simple categorical propositions. It is of these we have been hitherto speaking. We must now proceed to treat of Compound or complex Syllogisms, to which St. Thomas and the scholastic logicians give the name of Hypothetical.[1]

[1] This name has been objected to as the Greek equivalent of *conditional*, but this is not the case. In Greek ὑποθέσις has a far wider meaning.

Hypothetical Syllogisms fall into three different classes.

I. Conditional Syllogisms, in which the major premiss is a conditional proposition, while the minor either affirms the condition or denies the consequent depending on it (or, as it is called in Latin, the *conditionatum*), the conclusion being accordingly an assertion of the *conditionatum*, or a denial of the *conditio*, *e.g.*,

*If the wind is in the north* (conditio) *the weather is cold* (conditionatum),
*But the wind is in the north* (assertio conditionis),
∴ *The weather is cold* (assertio conditionati),

or, *But the weather is not cold* (negatio conditionati),
∴ *The wind is not in the north* (negatio conditionis).

*If the sick man's disease is typhoid fever* (conditio) *he is in danger of death* (conditionatum),
*But his disease is typhoid fever* (assertio conditionis),
∴ *He is in danger of death* (assertio conditionati),

or, *But he is not in danger of death* (negatio conditionati),
∴ *His disease is not typhoid fever* (negatio conditionis).

But if we deny the condition, it does not follow that we must also deny the consequent, for it may result from some other cause. It does not follow because the wind is not in the north that the weather is not cold, for an easterly wind may bring with it a very low temperature. If the sick man is free from

typhoid fever it does not follow that he is not in danger of death, for he may be suffering from some other fatal malady.

So again the truth of the antecedent does not follow from the truth of the consequent, cold weather does not prove a northerly wind; or danger of death the presence of the typhoid fever.

When the antecedent or consequent of a Hypothetical Syllogism is a Negative Proposition, its denial will consist in the omission of the negative, and will take the form of an Affirmative Proposition. Thus I argue as follows,

*If sceptics are right, Holy Scripture is not inspired of God;*
*But Holy Scripture is inspired of God;*
∴ *Sceptics are not right.*

Here the minor premiss, though an affirmative proposition, is a denial of the consequent, from which we rightly infer that the antecedent was false.

Hence the rules of Conditional Syllogisms are:[1]

(1) If we affirm the antecedent we may affirm the consequent. (2) If we deny the consequent we may deny the antecedent. (3) From the affirmation of the consequent or the denial of the antecedent no conclusion can be drawn.

II. Disjunctive Hypothetical Syllogisms are those

[1] These rules are summed up in Latin thus:

Posita antecedente, ponitur consequens,
Sublata consequente, tollitur antecedens,
Sublata antecedente vel posita consequente, nihil probatur

in which the major is a Disjunctive Proposition, and the minor either asserts or denies the truth of one of the alternatives, the conclusion accordingly denying or asserting the truth of the other alternative, as

*Either the sun moves round the earth or the earth moves round the sun;*
*But the sun does not move round the earth;*
∴ *The earth moves round the sun.*

*Either God created the world or it came into existence of itself;*
*But God did create the world;*
∴ *The world did not come into existence of itself.*

Disjunctive Syllogisms may have more than two alternatives in the major premiss, in which case if the minor asserts one of the alternatives, the conclusion will deny the rest.

*Either I am older than you, or the same age, or younger;*
*But I am older than you;*
∴ *I am neither the same age nor younger.*

If the minor denies one of them the conclusion will affirm the truth of one or other of those that remain.

*Either I am older than you, or the same age, or younger;*
*But I am not older than you;*
∴ *I am either younger or of the same age.*

If the minor denies all except one, that one will be affirmed in the conclusion.

*Either I am older than you, or the same age, or younger;*
*But I am not older, nor am I younger;*
∴ *I am of the same age.*

The laws laid down for the legitimacy of Disjunctive Propositions[1] must be carefully attended to in order that these syllogisms may be valid. If for instance, a student should say (as students have often said before now),

*Either I failed in my examination through illness, or through ill-luck, or through the spite of the examiner against me;*
*But it was not through illness, for I was quite well on the day of the examination, nor through ill-luck, for I was asked the questions I knew best;*
∴ *It must have been through the spite of the examiner;*

the unfortunate reasoner forgets the further alternative of ignorance or stupidity, and the major premiss is therefore not exhaustive.

So again if I argue,

*This man lives either in Australia, or New South Wales, or Victoria;*
*But he lives in Australia;*
∴ *He does not live in New South Wales, nor in Victoria.*

The conclusion is false, inasmuch as Rule 2 of Disjunctive Propositions is neglected, there being no opposition between the various propositions which compose the major premiss.

In the same way the alternatives of the dis-

[1] Pp. 289, 290.

junctive premiss must be opposed to one another, else there is no real opposition. The American hunter neglected this rule when he proposed to his Indian companion the following division of their spoils:

*Either I will take the lion and you the jackal, or you shall take the jackal and I will take the lion,*

To which the redskin mournfully rejoined,

*You no say lion for poor Indian once.*

III. A Conjunctive Hypothetical Syllogism is one in which the major premiss is a Conjunctive Hypothetical proposition, and the minor denies one of the alternatives given in the major, *e.g.*,

*No man can be at the same time a Freemason and a good Catholic;*
*But this man is a Freemason;*
∴ *He is not a good Catholic.*

IV. The Dilemma is a syllogism with a disjunctive major while the minor takes each of the alternatives and shows how they establish the statement of him who employs it against a real or imaginary opponent, *e.g.*,

*Herod after his promise to Herodias either had to put St. John the Baptist to death or to spare his life;*
*If he put him to death he was a murderer, if he spared his life he was a perjured liar;*
∴ *He had the alternative of murder or perjury.*

*Either I shall pass my preliminary examination or I shall fail;*

*If I pass, I shall have the pleasure of succeeding; if I fail, I shall be free of the nuisance of any further examinations;*

∴ *I shall have reason to be satisfied in either alternative.*

The rules of the Dilemma are three in number.

1. The disjunctive premiss must exhaust every possible alternative, *e.g.*,

*Either I must devote myself to the interests of my soul or to my worldly interests;*

*If I do the latter I shall lose my soul, if the former I shall ruin the interests of my family;*

∴ *I am therefore a most miserable man;*

where the major premiss omits the third alternative of attending to the interests of both.

2. The consequences which are shown to follow from the alternatives of the disjunctive premiss must be indisputable.

*I must either give up wine altogether or I shall continue to take wine;*

*If the former, I shall lower my general tone, if the latter, I shall gradually become a drunkard;*

*Hence, whether I drink wine or not, my health will be ruined;*

where in the disjunctive premiss the consequences do not necessarily follow. I may preserve my tone by tonics, or I may drink only in moderation.

3. It must not admit of a telling retort.

A man is offered a more lucrative situation elsewhere and argues thus:

*Either I shall have to give up a comfortable and remunerative post or I shall miss a better one which has been offered me;*
*To give up my post will be a serious sacrifice, to miss a better one will be very prejudicial to my prospects;*
*Hence I am very much to be pitied;*

where the argument is open to the obvious retort:

*If you keep your present post, you will continue in one which you say is comfortable and remunerative; if you resign it, you will have a better one;*
*Hence you are not to be pitied at all.*

There are three different forms of the Dilemma.

1. Simple Constructive where the same result follows from each of the alternatives in the disjunctive major.

*If this cancer be allowed to take its course, the result will probably be fatal, and if the patient submits to an operation, he will probably succumb to its effects;*
*But either he must allow it to take its course, or submit to an operation;*
∴ *In either case he will die.*

2. Complex Constructive, where different results follow from each of the alternatives in the disjunctive premiss, and the supposed opponent is offered the choice of the results in the conclusion.

*If Sir Thomas More were to have acknowledged Henry VIII. to be the Supreme Head of the Church, he would have forfeited the grace of God; if he refused to acknowledge it, he forfeited the favour of the King;*

*But he was compelled either to acknowledge it or to refuse to do so;*

∴ *It was necessary for him either to forfeit the grace of God or the King's favour.*

3. Complex Destructive, where different results follow from the various alternatives of the disjunctive premiss, and from the denial of all the different results follows a denial of one or other of the alternatives presented, as

*If this man has £100,000 in the bank he is a rich man, but if his word is to be trusted he has no money invested anywhere;*

*But either he is not a rich man, or he must have money invested somewhere;*

∴ *Either he has not £100,000 in the bank or his word is not to be trusted.*

## Other Variations of the Syllogism.

The Enthymeme is a form of the syllogism in which some mediæval logicians have strangely departed from their master, Aristotle. According to Aristotle, the Enthymeme is a *syllogism drawn from probabilities, and signs of the conclusion* (συλλογισμὸς ἐξ εἰκότων καὶ σημείων). It differs from the syllogism proper in its matter; the form may be the same, though it is not always so.

A *probability* (εἰκὸς) is a premiss that is generally esteemed true, and a thing is said to be *probable* which men know to be so for the most part, though perhaps not always: as, *Fat men are good natured; Love begets love; Suffering improves the character; Swans are white; Children resemble their parents.*

A *sign* (σημεῖον) is a demonstrative premiss which invariably, or for the most part, coexists with something else; or has taken place previously or subsequently to some other event, and is an indication of its existence or of its having happened. Thus a certain unsteadiness of gait is a sign of too much intoxicating liquor having been drunk; remorse is a sign of guilt; pallor a sign of indifferent health. The premiss which contains the sign being, *Men of unsteady gait are intoxicated; Those who feel remorse have a sense of guilt; The pale are in indifferent health.*

Enthymemes then have a premiss which is either a general probability or a sign, *e.g.*,

*Fat men are good natured* (εἰκὸς);
*Horace was a fat man;*
∴ *Horace was good natured.*

*Children resemble their parents* (εἰκὸς);
*Charles is the son of John and Mary;*
∴ *He will resemble them.*

*Men who roll in their gait are intoxicated* (σημεῖον);
*This man rolls in his gait;*
∴ *This man is intoxicated.*

The same thing can be under different aspects both a general probability and a sign of the conclusion. Thus Obesity is a sign of good nature, and a tendency to become fat points probably, though not certainly, to a good-natured disposition.

This is the true account of the Enthymeme as given by Aristotle and St. Thomas, but some logicians of the middle ages, mistaking the derivation of the word, described it as *syllogism with one of its premisses*

*suppressed*, and existing not in outward expression but in the mind (ἐν θυμῷ).[1] This meaning has however some basis in classical authors. Quintilian[2] tells us that Enthymeme means sometimes that which is conceived by the mind; sometimes an expressed opinion with the reason attached; or the conclusion of an argument either from consequences or from contradictories. Hence, he says, some call it a rhetorical, others an imperfect syllogism because its premisses are not distinct or complete.

The Enthymeme is almost identical with the Rhetorical Syllogism. It is the same thing looked at from a different point of view. It is an Enthymeme in so far as it has for one of its premisses something which we discover by reflection (ἐνθύμησις) to be a general probability or a sign of the conclusion. It is a Rhetorical Syllogism inasmuch as orators argue as a rule from premisses of this kind. It is this coincidence between the two which has given rise to the false definition and the modern idea of the Enthymeme. The rhetorician naturally suppresses one of his premisses. To take Aristotle's instance.[3] When the orator declares that Darius is to be crowned because he has been victorious in the Olympic games, he would sadly weary his audience if he were to insert the major premiss and to argue thus:

[1] The real derivation is from ἐνθυμεῖσθαι, the verbal substantive ἐνθύμημα being that which is laid to heart or reflected upon, or conceived or discovered by reflection.

[2] Inst. Or. V. ii.

[3] *Rhet.* I. 2, p. 1357, a. 16, Bekker.

*All who are victorious in the Olympic games are to be crowned;*
*Darius has been victorious;*
*Therefore he is to be crowned.*

The Enthymeme borrows this peculiarity from the Rhetorical Syllogism.

A sign may be either a *certain* sign or proof positive (τεκμήριον), or a *probable* sign. The possession of sensation is a *certain* sign of animal life. The equality of all straight lines drawn from some point within the figure to various points of the circumference is a *certain* sign that a figure is a circle. In this case the Enthymeme is a valid Deductive Syllogism, *e.g.*,

*All creatures possessing sensation are animals;*
*Glowworms are creatures possessing sensation;*
∴ *Glowworms are animals.*

The EPICHIREM (ἐπιχείρημα) or Dialectical Syllogism, like the Enthymeme, is used in modern books of Logic in a very different sense from that which it bears in Aristotle. Aristotle defines it as a *Dialectical* Syllogism, *i.e.*, a syllogism such as is employed in discussions where the debaters do not profess to be in possession of truth, but to be in search of it; or where the speaker or writer leads up gradually, by means of careful examination of various considerations and by discussion of difficulties, to the conclusion at which he ultimately arrives. The name *Epichirem* thus signified that he who employs it takes the matter in hand, attacks his opponents and endeavours to arrive at a conclusion; all which

ideas are included in the verb (ἐπιχειρέω) whence epichirem is derived.

But in the time of Quintilian the meaning had changed, and an Epichirem signified a process of argument already taken in hand and accomplished; a perfect proof which adds to one of the premisses the reason of its truth, as

*All rational beings are to be treated with respect, inasmuch as they are made in the image of God;*
*Slaves are rational beings;*
∴ *Therefore slaves should be treated with respect.*

This is the modern sense in which the word epichirem is used. Hence we define the Epichirem as *a syllogism in which one of the premisses contains the reason for its truth.* It can always be broken up into two valid syllogisms if it is itself valid.

SORITES (from σωρὸς, a heap) is a heap or string of propositions in which the predicate of each is the subject of the following, the final conclusion being composed of the subject of the first proposition and the predicate of the last, as

*All the children of Jacob are Jews,*
*All Jews appreciate the value of money,*
*All who appreciate the value of money make good bargains,*
*All who make good bargains become rich,*
*All who become rich are able to help the poor,*
*All who are able to help the poor are bound to do so,*
∴ *All the children of Jacob are bound to help the poor.*

There is always a certain accidental weakness or chance of weakness in a Sorites, on account of the

possibility of some error creeping in unobserved in the course of the series, and as no chain is stronger than its weakest link, the value of the conclusion is vitiated if a single one of the propositions is untrue. Similarly we must watch carefully to see that there is an exact identity throughout of the sense in which the terms are used.

The following is an instance in which lurk both these sources of weakness:

*All consumptive patients are ordered by their physician to eat meat on a Friday,*
*All who are ordered by the doctor to eat meat on a Friday are bound to do so,*
*All who are bound to eat meat on a Friday are bound to break the laws of the Church,*
*All who break the laws of the Church give grave scandal to others,*
*All who give grave scandal to others commit a serious sin,*
∴ *All consumptive patients commit a serious sin.*

The Sorites may be broken up into the same number of syllogisms in the First Figure as there are propositions between the first and last. We must begin with the second proposition as our first major premiss, and take our first proposition as the minor. From these two premisses we shall draw our first conclusion, *e.g.*,

*All Jews appreciate the value of money,*
*All the children of Jacob were Jews,*
∴ *All the children of Jacob appreciate the value of money.*

We then take our third proposition as the major

of our second syllogism and the conclusion just drawn as its minor.

*All who appreciate the value of money make good bargains,*
*All the children of Jacob appreciate the value of money*
*∴ All the children of Jacob make good bargains.*

Our fourth proposition will be the major and our new conclusion the minor of our third syllogism, and so on until we come to our last syllogism, in which the major premiss will be the last but one of our string of propositions, and the minor the conclusion drawn in the preceding syllogism.

*All who are able to help the poor are bound to help them,*
*All children of Jacob are able to help the poor,*
*∴ All children of Jacob are bound to help the poor.*

As the Sorites is broken up into syllogisms of Figure 1, it must obey the rules of that figure. No major premiss must be particular in any of the syllogisms, no minor must be negative. For if any of the premisses from the first to the last but one inclusive, be negative, we shall have a negative conclusion for our first syllogism, and therefore negative minors for those following it. Hence the rules of Sorites are:

1. *Only the first premiss can be particular.*
2. *Only the last premiss can be negative.*

For every premiss except the first is the major, and every premiss except the last is the minor, of one of the syllogisms into which it is resolved.

The *Polysyllogism* is a sort of variation of Sorites. It is a series of syllogisms, in which the conclusions are not repeated, but are left to be supplied as the minor of the syllogism following next, *e.g.*,

*All American citizens are proud of their country,*
*President Lincoln was an American citizen,*
∴ *President Lincoln was proud of his country.*

*All who are proud of their country are anxious to serve it.*
∴ *President Lincoln was anxious to serve his country.*

*All anxious to serve their country are willing to sacrifice themselves on its behalf,*
∴ *President Lincoln was willing to sacrifice himself for his country.*

*All who are willing to sacrifice themselves for their country are true patriots,*
∴ *President Lincoln was a true patriot.*

# CHAPTER V.

## ON FORMAL INDUCTION.

Summary—Growth of the Inductive Spirit—Influence of the Inductive Spirit—Ancient Induction—Aristotle's account of Induction—Induction Proper—Induction and Deduction—Value of Formal Induction—Weakness of Formal Induction—Contrast between the Ancient and Modern Spirit.

In our last chapter we discussed different forms of simple and complex syllogisms which have some variation from the normal type. Such are the Hypothetical Syllogism, the Dilemma, the Enthymeme, Epichirem, Sorites, and the Polysyllogism. We now enter on a more important chapter, one which discusses a matter where first principles are at stake.

The growth of the Inductive Sciences is one of the notes of modern research. The very word Science, once appropriated to Deductive or *a priori* knowledge, is now claimed as the exclusive property of Inductive or *a posteriori* knowledge. Some of our modern treatises on Logic give far more space to Inductive than to Deductive Logic, and regard it as far more important. Observation and experiment take in modern systems a prominence that was quite unknown to the ancients. The laws of

right observation and trustworthy experiment are examined and sifted with a carefulness of detail and a minuteness of inquiry to which Aristotle and St. Thomas were wholly strangers. Laws and canons are laid down for their employment, the methods that are to regulate them are represented as the very groundwork of Philosophy; and the once cherished principles of the *Dictum de omni et nullo* and the *a priori* laws of thought are relegated to an unhonoured obscurity.

This change dates from Bacon and Locke. It does not concern us to trace its origin or the cause of its development. It is enough to say that as men turned their thoughts from laws received upon authority to those which were framed as the result of human experience—or rather as all authority began to be regarded as built up from below rather than coming down from above, it was but natural that the new process of construction should assume an importance it had never enjoyed before, and that instinctive obedience to prevailing laws should be exchanged for a very critical inquiry into the validity and source of those laws. And when the school of reform in philosophy had decided that they came from below rather than from above, that they were true, because everywhere of force, not everywhere of force because true, it was but right and proper that they should be challenged by the scientific inquirer, and that their authority should be made subject to the most approved principles of impartial and unbiassed research.

We have first to consider the relation of the ancient and modern Induction, and how far we ought to give in to the claims of the latter to be the dominant method of modern Logic. We must see if there is in our two great authorities, Aristotle and St. Thomas, any recognition of modern Induction, and of the methods by which it is safeguarded. We must then examine the distinction between the Induction of ancient and modern times, and see what laws and canons regulate the one and the other. This portion of our inquiry is certainly no unimportant one, and one too beset with difficulties. We have to steer our course between the Scylla of a narrow and blind indifference to the value of the new discovery, and the Charybdis of a too great devotion to a hungry monster that seeks to swallow up all truth in its rapid and all-devouring vortex.

Induction in its widest sense is, according to Aristotle, a process by which we mount up from particulars to the universal.[1] This may be done in three different ways:

1. The particulars may be the *occasion* which enables us to recognize a universal *a priori* law. They put before us in concrete form two ideas, the identity of which we might not have been able to recognize in the abstract. Owing to our composite nature, we cannot see universal principles, except as embodied in concrete representations. We cannot exercise an act of thought respecting triangles

[1] Επαγωγὴ ἡ ἀπὸ τῶν καθ' ἕκαστον ἐπὶ τὰ καθόλου ἔφοδος (Ar., *Top.*, I. 12).

without having some sort of triangle present to our imagination. The intellect cannot work without the phantasy. We must have some sort of picture before our bodily or mental sight. If I tell a man ignorant of Euclid that the exterior angle of every plane triangle is exactly equal to the two interior and opposite angles, he does not intuitively recognize the truth of my statement. But if I draw first one triangle and then another, and prove it to him in the separate cases, he is able to mount up to the universal law. Even a single instance is sufficient to make it plain to him, when once he sees that the proof is independent of the kind of triangle of which there is question, and that it holds good whether the triangle be equiangular, isosceles, or scalene, obtuse-angled, or right-angled, or acute-angled. This, however, is scarcely Induction in the strict meaning of the word, for the argument is rather *through* than *from* the particular instance or instances to the universal.

2. Induction in its strict sense is based upon the particulars and argues *from* them, not *through* them. It is any process by which we are enabled to affirm or deny respecting the universal subject something that we have already affirmed or denied of the several particulars contained under it. It is naturally divided into two different kinds which furnish us with the second and third of the various meanings of the word.

(*a*) Complete Induction, in which all the particulars are enumerated.

(*b*) Incomplete Induction, in which only a portion of the particulars are enumerated, but from this portion a conclusion is drawn which covers those not enumerated.

Complete Induction is the exact reverse of the Deductive process. As in the latter we argue from the universal subject to each and all of the particulars contained under it, so in the former we argue from each and all of the particulars to the universal subject. Aristotle defines it[1] as *proving the major term of the middle by means of the minor.* It is thus opposed to deductive inference which proves the major of the minor by means of the middle. For instance,

*Saul, David, and Solomon were men of remarkable achievements;*
*But Saul, David, and Solomon were all the Kings of the whole of Palestine;*
∴ *All the Kings of the whole of Palestine were men of remarkable achievements.*

or, *Nettles, pellitories, figs, mulberries have flowers with a single perianth;*
*But nettles, pellitories, figs, mulberries are all the plants belonging to the order Urticeæ;*
∴ *All the plants belonging to the order Urticeæ have flowers with a single perianth.*

[1] *Prior Anal.* II. 23. Ἐπαγωγὴ μὲν οὖν ἐστὶ καὶ ὁ ἐξ ἐπαγωγῆς συλλογισμὸς τὸ διά τοῦ ἑτέρου θάτερον ἄκρον τῷ μέσῳ συλλογίσασθαι, οἷον εἰ τῶν Α Γ μέσον τὸ Β, διὰ τοῦ Γ δεῖξαι τὸ Α τῷ Β ὑπάρχειν οὕτω γὰρ ποιούμεθα τὰς ἐπαγωγάς.

In these syllogisms the names of the individuals or the lowest species are the *minor* term, inasmuch as they come under the class to which they belong, and though collectively they are identical with it in extension, yet they have a certain inferiority to it because it is always possible that some fresh historical or botanical or other discoveries might add another, whether to the list of kings who ruled over the whole of Palestine, or to the urticeous plants, or to any other enumeration of particulars coming under a universal. Hence in an Inductive argument the middle and minor change places, or rather that which is *minor* in point of possible extension, stands as the *middle* term, because in actual extension it is its equal. In this kind of argument the true middle humbly resigns its rights, and takes the place of the minor term of the syllogism.

Is the Inductive Syllogism a legitimate one? We must look back at the Import of Propositions. We have seen above that it states the existence of such a connection between two objects of thought that in whatever individuals you find the one you will also find the other. When I apply this test to the major premiss, I find it to be a true proposition; wherever Saul, &c., are found as objects of thought, there we shall also find remarkable achievements. But it is not similarly applicable to the minor. It is not true that wherever I find possible kings of all Israel there I shall find Saul, &c.; it is only true in the case of the actual kings as known to us. This weak point comes out when we fix our attention on the copula. *Saul, David, Solomon, are all the kings of*

*the whole of Palestine*, means not that the ideas of Saul, &c., are present whenever the idea of king of the whole of Palestine is present as an object of thought, but merely that in point of fact the class of all the kings is made up of these individuals. This is not the logical meaning of the copula, and at once creates the opposition between the syllogism and the induction of which Aristotle speaks, and the anomaly which he mentions respecting the middle term. This, moreover, accounts for the further anomaly of a universal conclusion in Figure 3, though this anomaly may be avoided by transposing the terms of the minor premiss.

Is Complete Induction of any practical usefulness? Yes, it has the same function as Deduction; it renders implicit knowledge explicit. We are enabled to realize what we had not realized before, to trace a universal law where we had not previously suspected one. It brings out some universal characteristic of a class, teaches us to recognize in those who are bound together as members of that class the possession of a common peculiarity which before we had only recognized as belonging to them as individuals. It is true that this sort of Induction, *per enumerationem simplicem*, does not establish any connection by way of cause and effect between the common property and the common class. It may be a matter of chance that all the kings who ruled the whole of Palestine were distinguished men, or that all the *urticeæ* have a single perianth. But it is at all events a suggestive fact, and leads us to question ourselves whether there must not have been some

reason why the kings in question had remarkable gifts, or the flowers in question have one perianth only.

For instance, if I go into the room of a friend and find his library consists of ten books, and ten only, and on examining them find that they are one and all books describing travels in China or Japan, a complete induction enables me to lay down the proposition,

*All my friend's books are books of travel in China and Japan.*

This suggests to me a train of thought that would never have arisen had I confined myself to the isolated fact respecting the nature of each book. Looking at them one by one, my thoughts are directed merely to the character of each, and the individual facts narrated in it. Looking at them together, I begin to think that my friend must either have been travelling in China or Japan, or that he is intending to go there, or that he must have friends in one or other of these countries, or that he is proposing to write an article on the subject, or that for some reason or other he must have a special interest in China and Japan.

Or to take an historical instance. I am studying Roman history, and as I read the history of the early Emperors who ruled the Empire, I am disgusted at the low standard of morality prevalent among them, the cruelty, the ambition, the lust that attaches to their name. I find Julius Cæsar engrossed by an insatiate and unscrupulous ambition—

Augustus a man of pleasure—while the rest were among the vilest of men. I observe, moreover, that when the Empire had passed out of the hands of the Cæsars there was a decided improvement. I also notice that the evil tendencies of the Cæsars increased, and that the first two Emperors were superior to the four who succeeded them.

I embody my reflections in an inductive syllogism:

*Julius Cæsar, Augustus, Tiberius, Caligula, Domitian, Nero, were men whose lives were marked by selfishness or crime;*

*All the Cæsars who ruled the Roman Empire were Julius Cæsar, Augustus, Tiberius, Caligula, Domitian, Nero;*

∴ *All the Cæsars who ruled the Roman Empire were men whose lives were marked by selfishness or crime.*

The conclusion of this syllogism naturally leads me to ask whether there must not be some influence tending to deteriorate the character in the position of Emperor of Rome, and further whether that influence is a universal one, or is limited to this family whose members appear to have been specially affected. This gives occasion to an interesting train of thought which would never have been suggested had I not mentally gone through the process of Complete Induction.

The weak point of a Complete Induction is that in so many cases we are not perfectly sure that it is Complete. We fancy that we have not overlooked any one of the particulars whence we argue to the

universal law, while all the time there is one that for some reason has escaped our notice, and perhaps this very one is fatal to the universality of our law. In the case of the Roman Emperors, it is always possible that there might have intervened between the reign of one Emperor and the next recorded, a short space of time during which there reigned some Emperor whom historians never knew of, or for some reason passed over in silence. We may practically feel certain that this is not the case, but we never can have that absolute certainty that leaves no room for any possible doubt. To take a more practical case: let us suppose a chemist arguing a century ago about the known metals:

*Iron, copper, silver, gold, lead, tin, mercury, antimony, bismuth, nickel, platinum, and aluminium, all are heavier than water;*

*Iron, copper, silver, gold, lead, tin, mercury, antimony, bismuth, nickel, platinum, and aluminium are all the metals;*

∴ *All the metals are heavier than water.*

Here would be a Complete Induction of the metals then known, but nevertheless the conclusion would be false; since that time potassium, sodium, lithium, &c., have been pronounced to be metals, and all these are lighter than water.

Of course there are some cases where an enumeration is perfectly secure of completeness, *e.g.*, if I argue that January, February, &c., all have twenty-eight days or more, I cannot be wrong in concluding that all the months of the year have twenty-eight

days or more. From the fact that Sunday, Monday, Tuesday, &c., are all named after some heathen deity, that all the days of the week derive their names from heathen deities. But this is merely accidental and comparatively rare, and for this reason we cannot draw any clear line of demarcation between Complete and Incomplete Induction.

The real contrast is between the Induction mentioned above, in which the instance or instances given merely *suggest* the *a priori* law, and inductions in which the instances given are the foundation on which the *a posteriori* law is based, whether they are a complete or an incomplete enumeration. The modern spirit, ever since the time of the Reformation, has been doing its best to obliterate this contrast, to degrade the law which has its reason in itself, and which looks to examples merely as the means of enabling us to realize its binding force, to the level of the law which depends upon the examples for the existence of its power to bind. Under pretence of questioning nature, it ignores the God of nature, and is willing to accept as laws only those which are gathered together by human industry, and will not allow a higher kind of law which is based on the inner essence of things, and ultimately upon the nature of God Himself. It recognizes only those which can be secured by a plebiscite, and allows no superiority to any of those having the direct sanction of the Supreme Ruler of the Universe, and binding as soon as a single concrete instance presents itself to us. In other words, the Inductive spirit thrusts out of sight

*a priori* laws, and makes *a posteriori* investigation to be all in all. While it certainly fosters commercial activity and progress in all that pertains to things material and sensible, it tends to make men forget things immaterial and spiritual, and destroys their realization of, and their belief in, those inner realities, compared with which the visible world is but a shadow and a thing of nought.

# CHAPTER VI.

## MATERIAL INDUCTION.

Material Induction recognized by Aristotle—Opinion of Catholic Philosophers—Induction and the Syllogism—Incomplete Induction—Material Induction and Formal Logic—The Province of Material Logic—The certainty of Physical Laws—Hypothetical Certainty — The Inductive Methods — Method of Agreement—Methods of Difference—Instances of the various Methods—Method of Concomitant Variations—Method of Residues—Combination of Inductive Methods—Fallacy of Mill's Theory of Causation—Value of Inductive Methods—Dangers of rapid Induction.

WE now come to Incomplete or Material Induction. Incomplete Induction as such is recognized by Aristotle, though he does not say very much respecting it. It comes under his definition of Induction as a process from Particulars to Universals, and the very instance he gives is an instance of Material and Incomplete Induction.

*Pilots, charioteers, &c., who know their business are most skilful,*

∴ *Generally all who know their business are most skilful.*

Further, he describes it as more persuasive, and clearer, and more capable of being arrived at by perception, and more within the reach of the masses, while the syllogism is more forcible and clearer as an

answer to gainsayers.[1] Here it is evident that he is speaking of an argument from a limited number of instances to the whole class. He describes the object of Induction as being to *persuade* rather than to *convince*, as being clearer in the eyes of ordinary men, inasmuch as it appeals to their sensible experience; as more within their reach, as being an argument that all can appreciate, whereas the argument that starts from first principles implies a grasp of such principles, and this is comparatively rare among the mass of men. Yet it has not (he says) the compelling force of deductive reasoning, inasmuch as it can always be evaded. It is not in itself so clear as the Syllogism, it does not hit home with the same irresistible force as the argument that makes its unbroken way from the first principles that none can deny to the conclusion which we seek to establish. And this is exactly applicable to Material Induction, and would have little or no force if we were speaking of Formal and Complete Induction. The example, moreover, that he gives is so incomplete as scarcely to deserve the name of Induction at all. He merely takes two instances of the arts, and from them at once draws the conclusion that in the arts skill and success are inseparable. Possibly he chooses this extreme instance to show how very imperfect an induction

[1] Cf. Arist. *Top.* I. 12: Ἐπαγωγὴ ἡ ἀπὸ τῶν καθ' ἕκαστον ἐπὶ τὰ καθόλου ἔφοδος, οἷον εἰ ἔστι κυβερνήτης ὁ ἐπιστάμενος κράτιστος καὶ ἡνίοχος, καὶ ὅλως ἐστὶν ὁ ἐπιστάμενος περὶ ἕκαστον ἄριστος. ἔστι δ' ἡ μὲν ἐπαγωγὴ πιθανώτερον καὶ σαφέστερον καὶ κατὰ τὴν αἴσθησιν γνωριμώτερον καὶ τοῖς πολλοῖς κοινόν, ὁ δὲ συλλογισμὸς βιαστικώτερον καὶ πρὸς τοὺς ἀντιλογικοὺς ἐνεργέστερον.

may be sufficient to establish a general law, where that law has the constant and universal testimony of mankind in its favour, and that men need only to be reminded of the law by the instances adduced rather than to be taught any fresh truth from an examination of the invariable co-existence of the two objects of thought, which the instances exhibit as invariably united.

Aristotle's brief reference to Induction is a remarkable contrast to the elaborate treatment of it by some modern writers on Logic. St. Thomas and the scholastic logicians generally are equally meagre in their discussion of it. Even the Catholic logicians of the present day pass it over in a few paragraphs or a few pages, which are devoted in part to an attack on Baconian Induction, and to an assertion that Induction has no force unless it can be reduced to syllogistic form. Sir W. Hamilton, Mansel, and the Scottish school of philosophers are at one with the schoolmen and modern Catholic writers in their jealousy of the intrusion of Induction, and, although they do not agree with them in advocating the necessity of reducing it to the form of the syllogism, yet they would assign it a very subordinate place in a treatise on Logic.

It is the modern school of experimentalists, of which Mr. John Stuart Mill is the illustrious leader, who put forward Induction as "the main question of the science of Logic, the question that includes all others." This suggests to us three questions:

1. How far does Induction come into Logic at all?
2. Is it true that all Induction must be capable

of being reduced to a syllogistic form in order to be valid?

3. Is the neglect of Induction by modern Catholic logicians to be praised or blamed?

We are speaking here of Material or Incomplete Induction, and unless we warn our readers to the contrary, we shall continue to use it in this sense to the end of our present chapter.

"Induction," says Cardinal Zigliara, "has no force whatever apart from the Syllogism." "Incomplete Induction," says Tongiorgi, "is not a form of argument different from the Syllogism." "Induction," says Mendive, "is a true form of reasoning, and it pertains to the essence of reasoning that it should be a true Syllogism." "Induction," says Liberatore, "does not differ from the Syllogism in its essence, but only in the form it takes." Yet we have seen that when reduced to syllogistic form, it breaks the rules of the Syllogism and uses the copula in an altogether different meaning. How then are we to solve the difficulty?

As usual we have to examine carefully into our use of terms. *Syllogism* is an ambiguous term. There is the Deductive Syllogism with its figures and moods, such as we have described them above, and which is subject to and based upon the *Dictum de omni et nullo*, viz., "Whatever may be affirmed or denied of a universal subject may be affirmed or denied of each and all the individuals who are included under that subject." In this sense Induction is outside the Syllogism, and any attempt to reduce it to syllogistic form at once exhibits a violation of syllogistic laws.

But beside the Deductive Syllogism the word Syllogism is used in a wider sense for any process of reasoning based on the more general principle, "Whenever two objects of thought are identical with a third they are also identical with each other." This principle includes not merely the Deductive Syllogism, but the Inductive Syllogism also.

Induction therefore comes into Logic as reducible to syllogistic form, but not to the form of the Deductive Syllogism. This is true of both Complete and Incomplete Induction. When I argue:

*James I. and II., Charles I. and II. were headstrong monarchs,*
*James I. and II., Charles I. and II. were all the monarchs of the Stuart dynasty,*
∴ *All the monarchs of the Stuart dynasty were headstrong,*

I violate one of the rules of the Third Figure by my universal conclusion. I use the copula not for the necessary co-existence of true objects of thought, since it is not inconceivable that future Stuarts might arise and falsify my minor, but for the fact which is true in the concrete. My argument, moreover, refuses to obey the authority of the *Dictum de omni et nullo*, and is therefore no true form of the Deductive Syllogism. But my argument is a perfectly valid syllogism in that it is in accordance with the principle of identity I have just given: it is in accordance with the laws of thought, it is perfectly logical.

But is this true of Incomplete Induction? For instance, I argue from the fact that I have observed

on a number of separate days in the year that all the days when there has been a gradual fall in the barometer have been followed by rain; and I state the result of my observation in the following premiss:

*January 18th, March 4th, April 7th, October 19th were succeeded by rainy weather;*

*January 18th, March 4th, April 7th, October 19th were days on which there was a fall of the barometer;*

*All the days on which there is a fall of the barometer are days followed by rainy weather.*

In order that the conclusion may hold true in strict logic, I must be able to assert that January 18th, March 4th, April 7th, October 19th were all the days when there was a fall in the barometer, and this is obviously ridiculous. But may I not put my minor in another form, and say: *What is true of January 18th, &c., is true of all days when there was a fall in the barometer?* If I can, the conclusion certainly follows, and I can re-arrange my syllogism in a convenient form in the First Figure, and argue thus

*What is true of January 18th, March 4th, April 7th, October 19th, is true of all days when the barometer falls;*

*Rain near at hand is true of January 18th, March 4th, April 7th, October 19th;*

*Rain near at hand is true of all days on which the barometer falls.*

Everything therefore depends on the representative character of the days in question. If they have

nothing in common save this one common feature of the fall of the barometer which can be connected with the coming change in the weather, then no one can deny that there must be some sort of connection between a fall in the barometer and rainy weather near at hand, which will justify us in predicting of all days on which the barometer falls, that they will be succeeded by rain.

We have then to find out by some means or other whether the major premiss of our syllogism is true. But before we enter on an investigation of this point, there is a previous question. Does it concern us as logicians to investigate it at all? Is it within our scope to examine into the various instances in order to sift their value as evidence? Has not the logician to assume his premisses as true, supposing always that they contain nothing which violates the laws of the human mind and of right reason? Or is he to employ, in order to discover their truth, the various methods of observation and experience by which the truth of all *a posteriori* and Synthetical Propositions have to be tested? If these lie outside the province of Logic, the moderns are not only one-sided and unfair in giving so large a space to Induction, but are all wrong in their very conception of the task that they have to perform.

This question can only be satisfactorily answered by reminding the reader of the distinction between Formal and Material (or Applied) Logic. Formal Logic simply takes its premisses for granted so long as they do not sin against any law of thought or contradict any proposition of the truth of which we

are absolutely certain. Applied Logic steps outside the comparatively narrow field, and asks what the terms are which regulate our admission into the mind of any proposition as a part of our mental furniture. Formal Logic in its strict sense, therefore, has nothing to do with the conditions under which we can arrive at Universal Propositions other than those to which we are compelled by the nature of the mind itself. It has nothing to do with those Propositions which we are led to regard as true, by reason of what we witness in the external world, and which depend upon laws learned by observation and not rooted in us as *a priori* conditions of thought. It has nothing to do with the methods of arriving at those *a posteriori* truths.

But the hard and fast line between Formal and Applied Logic is one of theory rather than one that can be practically observed. We have already considered the Foundations of Logic, though here we were stepping outside the strict boundary of Formal Logic. Similarly we shall do well in a question so important to look to the matter of our syllogism in order to discover whether modern Induction can furnish us with a solid basis for a universal premiss.

But there is now the further question whether observation and experiment have any claim to consideration under the head of Applied Logic; whether as means of adding to the propositions that we regard as *certain* and adopt as such, they should be examined into, and the results to which they lead tested as to their qualifications for admission into the mind. Can they give us the

certainty we require as logicians? Probably no one in his senses would deny that external observation can give us some sort of certainty. That the sun will rise to-morrow morning, that a stone thrown into the air will fall to earth again, are as certain as anything can be that does not depend upon the inner laws that regulate all being.

But such a certainty is, strictly speaking, always a practical or *hypothetical*, never an essential or absolute certainty. It is within the bounds of possibility that some unknown comet might intervene between the earth and the sun during the coming night, or that some undiscovered and mysterious influence might whisk away our stone to the moon, not to mention the further possibility of Divine interference by what we call a miracle.

Here it is that *a posteriori* laws, which are based on observation and experiment, differ (as we have already remarked more than once) from *a priori* laws. In the case of the latter, no miracle can intervene, no possible hypothesis can set them aside. God Himself cannot make five out of two and two, or prevent things equal to the same from being equal to one another, or cause the exterior angle of any plane triangle to be less than either of the interior or opposite angles. It is beyond the utmost limit of Divine Omnipotence to bring about any of these results, simply because they are in themselves contradictory and would if they were realized make God deny Himself. These *a priori* laws are not only laws of thought and of human reason, but of Being and of the Divine Nature. They are based upon the

nature of God Himself, and thus on eternal and immutable Truth.

Not so the physical laws at which we arrive by observation and experiment. God could reverse them all to-morrow if He chose. He does from time to time intervene and hinder their efficacy. They are not founded on the Divine nature, but in the Divine enactment. They are, therefore, liable to exceptions, and this is why we say that they are only an *hypothetical* or *conditional* certainty.

But they have another source of weakness. Not only can God set them aside at any moment if He pleases, but we are not absolutely certain whether they exist at all. All that we call physical laws are but hypotheses which have gradually won their way to the stage of certainty. They are never metaphysically certain. We have not the means of arriving at any metaphysical certainty, when we depart from those laws which are stamped on all being, and therefore on the human intellect, which are the very conditions under which we think, because the conditions under which all things, and even God Himself, necessarily exist. When we come to laws which are partly *a posteriori*, we never can say more than that they are generalizations from experience; that they explain all the facts known to us; and that they satisfy every test applied to them.

Such are the law of gravity, the undulatory theory of light, the laws of attraction and distance, &c. All this gives us *physical* certainty respecting them, but this is utterly inferior to *absolute* certainty. We not only have to accept them as conditionally true, but

our acceptance of them, as such, has in it an element of weakness.

It is the attainment of this kind of certainty which is regulated by the various methods that have come in since the time of Bacon, and which have been elaborated by Mill under the name of the *Methods of Induction.* It cannot be denied that these methods were an object of comparative indifference and neglect to the Scholastic and Aristotelian philosophy. The pre-reformation world did not recognize the importance of those modern discoveries and inventions which have revolutionized the world since the days of Bacon. With the Aristotelian philosophy dominant, the steam-engine, gas, the electric light, the steam-loom, sewing-machines, and all the mechanical substitutes for human labour, would, in all probability, either not have existed at all, or never arrived at their present perfection. The *a priori* method had no fondness for hypotheses, and hypothesis is the fertile mother of physical research and discovery. Whether all these have really fostered human progress, whether they have made men stronger, healthier, more honest, virtuous, and happy, is a point which does not concern us. We have already wandered too far away from the question before us, which is this: Are we to admit into Logic in its wider sense what are called the *Inductive Methods,* and which are elaborated with wonderful skill and ability by John Stuart Mill?

If we look at the matter with the strictness and accuracy of the philosophic logician, who knows no certainty save absolute certainty, no universal laws

save those which are founded on the inner nature of things, we must answer this question in the negative. To give the Inductive methods a place in a strictly logical treatise, seems to exalt the laws which are based on them to a sort of equality with the *a priori* laws. It seems to exalt hypothesis into law, to confuse practical with absolute certainty, to obliterate the distinctions between the eternal, the necessary, the immutable, and the transitory, the contingent, the mutable.

In spite of this, these methods cannot be passed over in the present day. They are too important a factor in the present condition of human society to admit of our neglecting them. They are weapons which have been forged by what is called the march of human intellect, and it would be suicidal to deny their value and their efficacity. As science has now a new meaning, so we must admit under the category of scientific laws those which the scholastic philosophy with all good reason repudiated. Besides, we must understand and appreciate them in order to protest against their abuse. We must give them their due in order that they may not usurp the whole field of human science. Mill and his followers drag down all the *a priori* laws to the level of the *a posteriori*, or rather deny the existence of *a priori* laws at all. This is the fatal result of the rejection of scholastic methods which began at the Reformation, and has been carried further day by day. But *fas est et ab hoste doceri*, and the various methods set forth in detail by Mill have, in their own proper limits, a most

important function to perform, and are of constant application to our every-day life.

We have now to return to our consideration of the premiss which asserts the representative nature of the instances on which we are going to base our law. Our methods are to give us the means of ascertaining this; they are to decide for us whether what is true of the instances under our consideration is true of all instances real or possible, or at least they are to settle the question for us, so far as it is possible in the nature of things to arrive at any certainty respecting it.

Our premiss then asserted that what was true of January 18th, &c., is true of all days on which the barometer falls, and the value of our argument depends upon our being able to establish this proposition. What is necessary in order to prove it satisfactorily is to show, that these days had nothing in common which could possibly be connected with the approach of rainy weather save a certain heaviness in the air indicated by the fall in the barometer. If this could be ascertained beyond a doubt, then we should have a perfect physical certainty that there was a connection of cause and effect between the heaviness in the air and the subsequent rain. But in point of fact we never can be sure that there are not other characteristics common to these days which might be the source of the phenomenon of rain. To be absolutely certain of this would require a knowledge of the inner nature of things which even the greatest of scientists does not possess. All that we can say is that *we are unable to detect* any

common characteristic in the days in question which would account for the subsequent rain, save only the heaviness in the air and the consequent fall in the barometer, and therefore the connection between the rain and the heaviness in the air is at most but a strong probability.

Here we have a case of the first of Mr. Mill's experimental methods—the *Method of Agreement.* We cannot do better than formulate it in his own words:

METHOD OF AGREEMENT.

"If two or more instances of the phenomenon under investigation have only one circumstance in common, the circumstance in which alone all the instances agree is the cause (or effect) of the given phenomenon."

Our readers will observe that in this law Mr. Mill goes beyond the requirements we have given above, and exacts not only the presence of no common circumstance which would account for the result save one, but absolutely the presence of no common circumstance at all save one alone. In the case before us we can never find two rainy days, devoid of any common circumstance save that on one the barometer falls and on the other it does not; and the same is true of all possible instances of phenomena to be investigated. Until we have this impossible condition fulfilled, the law can never be applied, and therefore we can never derive from this method more than a strong probability.

But there is another method which comes in to

supplement the former. Let us suppose that we find a day exactly corresponding to one of the days afore-named in every circumstance save one, viz., the weight of the air. In all else they are exactly alike. When we examine the rain record of the year we find that on the day when the air was heavy rain followed, and on the day when it was light fine weather came after it. Here we should have perfect physical certainty if only we could find two days corresponding exactly in every possible circumstance save one; there would be no doubt whatever as to the connection of this circumstance with the result that was present where the circumstance in question was present, absent where the circumstance was absent. But here, too, it is impossible to find any two such days; there must of necessity be a thousand points of difference between the two. All that we can have is a certain amount of correspondence, and the absence of any points of difference which seem likely to be connected with the result save the single circumstance which is conspicuous for its presence in the one case and its absence in the other. Here, therefore, again we are limited to a probable connection, and can get no farther.

In this case we have an instance of the *Method of Difference*. Again we will give it in Mr. Mill's words:

METHOD OF DIFFERENCE.

"If an instance in which the phenomenon under investigation occurs and another in which it does not occur have every circumstance in common save one, that one occurring only in the former, the

circumstance in which alone the two instances differ, is the effect, or the cause, or an indispensable part of the cause of the phenomenon."

But this second method, as Mr. Mill very pertinently remarks, is applicable rather to experiment than to observation, that is to cases where we can artificially vary the antecedents instead of having to receive them ready-made. We will, therefore, take another instance, which will, moreover, have the advantage of illustrating other methods of Inductive Research which cannot be so easily applied to the case of the weather.

We will take a familiar and very practical case. I have of late, from time to time, risen with a headache in the morning for which I cannot account. Somehow I fancy it must be connected with some sort of digestive disarrangement, and that this disarrangement is the result of some food which I have taken and which does not suit my stomach. One day it occurs to me that my headache always follows a special diet, and that possibly this may be its cause. I therefore take note of what I have for dinner, and after a little experience I discover that in most cases when I have eaten jugged hare for dinner I have a headache the next morning. I set to work to test the connection by means of the methods of Agreement and Difference. First of all I take a number of days when my dinner has been as varied as possible. On one day I have taken soup, on another day none. On one day I have had beef for the chief dish, on another mutton, on another veal, on

another pork. On one day I have drunk port wine, on another sherry, on another champagne, on another hock, on another claret, on another nothing but water. On one day I have taken pastry, on another not, on one day cheese, on another none, and so on *ad infinitum*, varying my dinner in every possible way on the days of trial. But on all these days there has been the common element of jugged hare, and on each of them there has been a headache following. Here we have a good instance of the *Method of Agreement*. The various days on which I suffer from headache agree, as far as I can tell, in no common circumstance of diet, save only in this one special dish.

But I cannot be certain that there may not have been any other cause for my headache which happened to coincide with the jugged hare. I may have been rather tired on the evenings in question, or perhaps a little more thirsty than usual, and the wine may have been more attractive than on other days. So I proceed to a further experiment. On two given days I take the same amount of exercise and order exactly the same dinner, drink exactly the same amount of wine, and go to bed at the same hour. The only difference between these two days is that on the former I make jugged hare an item in my bill of fare, and on the other omit it. The result is that the former day is followed by a severe headache, whereas on the latter I rise fresh and ready for business.

Vegetus consueta ad munia surgo.

Here I have the Method of Difference. At first the

experiment seems decisive. But it is not really so. It may be the mere difference of quantity involved in the presence of the jugged hare that is the cause of the headache; or perchance on the day I ate of it the wind was in the east, or my stomach was already out of order, or some unwonted worry had befallen me. I therefore am still in the region of probabilities. Can I ever escape from them? I can do a good deal towards it by means of a third method which is often extremely useful.

I resolve on a new experiment. I determine that I will try the effect of eating on one day a very small portion of jugged hare at my dinner, on another a good deal more, on another of making it the chief part of my dinner, and on another of having no other meat dish at all. The result is that I find the severity of my headache is exactly or almost exactly proportioned to the amount of jugged hare that I have eaten on the previous evening. A small quantity produced a very slight headache, a larger quantity a more serious one, while, on the morning following the day when I ate nothing else than hare I was so wretchedly ill that I was unable to attend to my ordinary business. Here is what is generally known as the

### METHOD OF CONCOMITANT VARIATIONS.

"Whatever phenomenon varies in any manner whenever another phenomenon varies in some particular manner, is either a cause or an effect of that phenomenon, or is connected with it through some fact of causation"

I am now approaching certainty, but there is nevertheless a possible element of uncertainty arising from the chance of the varying headache having been owing to circumstances which by a curious coincidence happened to produce it in a severity which quite by accident was in proportion to the amount of jugged hare eaten for dinner. I am after all still in the region of probabilities, and I look around for a final method to try and assure the truth of my inference.

I have for years been studying the effect of various sorts of food and drink, as well as of walking, hard study, riding, boating, &c., on my constitution. Long experience has taught me the effect of each of those. Beef and mutton make me rather heavy the next morning, so does port wine; champagne makes me rise well contented with myself. Plum-pudding produces indigestion; walking, riding, &c., various different kinds of bodily fatigue; severe mental labour a curious feeling of oppression on the top of my head, and so on. On some particular morning I take stock of my bodily condition and its various constituent symptoms; I am able to trace each and all of them to some familiar antecedent, all except the headache. I can trace in the present state of my body the result of most of the circumstances of the previous day, the mental and bodily labour, the various kinds of food, the amount of sleep, each has its familiar result, all save the jugged hare. Hence I subduct from the various results all those I can trace to known causes, and (neglecting minor details) I have left on the one hand the headache and on

the other the jugged hare. Surely then this result unaccounted for must spring from the cause not yet taken into consideration. This method, which can often be employed with much advantage, is called the *Method of Residues.* Mr. Mill formulates it in the following law:

METHOD OF RESIDUES.

"Subduct from any phenomenon such part as is known by previous induction to be the effect of certain antecedents, and the residue of the phenomenon is the effect of the remaining antecedent."

Does this give us perfect physical certainty? Most decidedly not, if we take it by itself. My attribution of effect $a$ to cause $A$, of $b$ to $B$, is at best only a probable argument, and even if it is all correct, I cannot be sure that I have exhausted either consequents or possible antecedents. I am not absolutely certain that the oppression in the head is due to study or the heaviness of the port wine. At most this method only contributes its share to the ever-increasing stream of probability which is gradually developing itself into the resistless river of practical certainty.

But when all these Methods are united together, surely then we have certainty. Surely we can go beyond the mere tentative assertion of an hypothesis to the firm conviction of a well-grounded law, a law which certainly connects together the circumstances we are considering as cause and effect; or at least as in someway connected together by a fixed and stable law of causation.

Here we enter upon a wider topic which we have already discussed in this volume. To those who still hold to *a priori* truths, to the school of Aristotle and St. Thomas, there opens out an endless vista of causes and effects descending from God, the First Cause, to every detail of His works. These causes and effects are twofold, *metaphysical* causes, connected with their effects with an *absolute* certainty which is inviolable, and *physical* causes, connected with their effects with *physical* or *conditional* certainty. With metaphysical causation these methods are not concerned; it needs no series of experiments or of observation to detect the *a priori* law. It is with physical causation and physical laws that they are alone concerned. They have to detect the *a posteriori* laws which depend on the free action of the Creator. All things that God has made are connected together by physical laws which He has decreed, but from the action of which He may at any time except certain cases at His good pleasure, and which He does except from time to time by what we call a miracle.

But to the modern school of sensationalists, to Mill and Bain, cause and effect are words which have no meaning. Cause is but invariable unconditional antecedent, and effect invariable, unconditional consequent. The cause need not contain its effect: there is nothing in the nature of things that links them together: there may be portions of the universe where there is no such thing as invariable unconditional sequence. The belief in the connection between cause and effect is to the sensationalist

merely the result of long experience in the past, and how do we know that this experience may not hereafter vary? If sensationalists were logical there would be for them no certainty about the future, for what possible reason is there why it should resemble the past? Because it has always done so? The very supposition is a contradiction in terms; for the future is still unborn. All that experience has taught them is that one portion of the past has hitherto resembled another, that there has always been an unbroken uniformity of succession in the series of antecedents and consequents. But of the future *as such* we never have had and never can have any experience, and our conjectures respecting it are, if we logically follow to their conclusions the theory of Mr. Mill and his school, the merest guess-work, an arrow shot into the air without any sort of reason for believing that it will hit the mark.

Our conclusion, therefore, is that these Methods are a most valuable contribution, if not to Logic strictly so called, yet to the course of human discovery and scientific research. The Catholic philosopher learns from Aristotle and St. Thomas the *a priori* law, one of the first principles of all knowledge, that "every effect must have a cause." He knows that this law extends not merely to effects following as particular applications of some *a priori* law, which becomes known to us as soon as a single instance of it is presented before us and grasped by the intelligence, as in the case of the deductions of mathematics, but to others also. It extends to effects following from what is rightly called a *law*, inasmuch as it is a general

principle under which a vast number of particulars are ranged, but is nevertheless arrived at by generalization from a vast number of particular instances. In the one case as in the other the universal law of causation holds. In the one case cause is joined to effect in virtue of the inner nature of things; in the other, simply because the will of God has so disposed the arrangements of the universe that He has created. In the one case, experience makes known to us a law which is already imprinted on our intelligence; in the other, experience makes known to us a law which is stamped upon the world outside, but which only becomes a part of our mental furniture when we have carefully weighed and sifted a number of individual instances of its operation. In the one case the Methods of Induction are rarely, if ever, of any practical use; in the other they are simply invaluable.

We are now in a position to assign their true place to the Inductive methods of which Bacon was the harbinger, and Mr. John Stuart Mill and his school the prophets and apostles.

1. They certainly claim a place in Material Logic if not in Formal. To ignore them and pass over Material Induction with a passing remark that it must be virtually complete, *i.e.*, must include a number of instances sufficient to afford a reasonable

[1] At the same time we have absolute certainty as to the permanence of physical laws as long as the universe remains in existence, since this is demanded by the wisdom of God. But we have not absolute certainty as to the application of the law in a particular case, nor have we absolute certainty that the universe will continue to exist.

basis of certitude, is to omit a subject which is of the greatest importance in every branch of modern investigation. A just appreciation of it is necessary if we are to keep pace with the development of scientific research. We should not be so easily taken in by the hasty generalizations of the modern scientist, if we had the use of these methods and the kind of certainty that may be derived from them at our fingers' ends. It is of no use to allege the authority of Aristotle and St. Thomas. If they had lived in the present day they would have taken the lead in regulating the methods of modern research, just as in their own day they laid down the principles of deductive argument. The eager questioning of nature was in their day a thing conducted in a very different fashion from that which experience has gradually perfected, and mechanical discovery advanced. Any elaborate setting forth of the methods to be pursued would then have been superfluous and unnecessary and premature, whereas now it is not only of the greatest value in itself, but necessary to one who would successfully encounter the inroads of hasty generalization, and the pretensions of hypothesis to take its place among established laws.

2. These Inductive Methods can never give us *absolute* certainty, but they can give us *physical* certainty. They cannot give us absolute certainty, because the laws they reveal to us are reversible at the will of their Maker. They can give us physical certainty, for the simple reason that the human mind is so constructed as to be able to judge without any

reasonable doubt, from a combination of arguments of which it may be that no single and individual one is sufficient to carry conviction to the mind. But the number of them combined is enough, and more than enough, to make us perfectly sure of the conclusion to which they one and all concurrently point.

3. We must always be on our guard against allowing ourselves to be persuaded into a conviction of the truth of some general hypothesis when the concurrent evidence is not sufficient of itself to establish it. We must remember Aristotle's admirable distinctions between Deduction and Induction, that the one is more forcible and clear (*βιαστικώτερον καὶ σφέστερον*), the other more persuasive (*πιθανώτερον*), and within the reach of the masses. We have too often seen the intellectual convictions of scientific men shaken by the brilliant guesses which Induction suggests, and which they regarded as justifying them in discarding the beliefs that they previously held to be true. Very slow and cautious should we be in allowing any law arrived at by a process of Pure Induction to set aside any conviction based upon a higher and more certain mode of argument. Of course there are occasional instances, as the so-often quoted case of Galileo,[1] but for one

[1] The condemnation of Galileo has been so often explained by Catholic writers that it is scarcely necessary to point out that it does not in any way affect the question of Papal Infallibility. Galileo was condemned by the Congregation of the Index, not by the Pope *ex cathedra*, and the Pope cannot delegate his Infallibility. Whether Galileo's brilliant guess had sufficient data at that stage of astronomical science to justify him in asserting it as a fact, it is not easy to decide.

such instance there have been hundreds in which some premature hypothesis has been allowed to weaken the grasp on *a priori* truth, to be in its turn discarded for some equally premature successor sitting in its turn for a brief period in the usurped throne of truth.

# CHAPTER VII.

## EXAMPLE AND ANALOGY.

Example—Socratic Induction—Dangers of Socratic Induction—Value of Example—Analogy—Weakness of Analogies—Analogy and Metaphor.

WE have somewhat outstepped the strict limits of Formal Logic in our last chapter, but it was necessary to do so, in order that we might do justice to the services rendered by Material Induction and point out its true place in philosophy. We now return to forms of argument recognized by all logical text-books and which are closely akin to Induction.

1. EXAMPLE.—Example (*παράδειγμα, exemplum, argumentum ex paritate*), is a form of argument that proceeds from one or more individual instances to a general law, and then applies the general law to some further individual instance. It is the most limited possible form of material induction, with a syllogism appended applying the result of the induction to a particular case.[1]

[1] It is defined by Aristotle as *proving the major of the middle by a term resembling the minor*, a definition which it is not very easy to understand, but which appears to have been worded with a view to contrast it with Induction. The meaning of Aristotle's definition is explained in Mansel's Aldrich, Appendix, note H, "On Example and Analogy," to which we would refer our readers.

For instance, I happen to be staying in an hotel in Paris where I make the acquaintance of a Russian gentleman. I find him not only most courteous and kind, but full of information and an excellent linguist. His talents in this respect make such an impression on me that I unconsciously argue as follows:

*M. Nicolaieff is a good scholar and linguist;*
*M. Nicolaieff is a Russian gentleman;*
∴ *All Russian gentlemen are good scholars and linguists.*

But I do not stop here. Some little time afterwards I encounter at Berlin another Russian gentleman, and at once I jump instinctively to the conclusion, or at all events to the expectation, that he too is a man of wide knowledge, and well versed in modern languages. If I put my argument into syllogistic form it will run thus:

*All Russian gentlemen are good scholars and linguists;*
*M. Smolenski is a Russian gentleman;*
∴ *M. Smolenski is a good scholar and linguist.*

If my first acquaintance at Paris has not been limited to M. Nicolaieff only, but has extended to a number of his friends, cultivated and scholarly gentlemen like himself, then my first argument by which I ascend to the universal will not be the same rapid leap from a single instance. It will have a degree of probability higher in proportion to the number of instances from which I am able to argue, and I shall have a more reasonable ground for my conclusion respecting the further instance or instances that I may encounter.

When the argument thus proceeds from a number of instances it is called a *Socratic Induction.* It was the method which Socrates continually employed to prove all kinds of conclusions true or false. Nothing can give a better notion of the extreme danger of arguing from a few plausible instances than the ingenious employment of it by the Athenian philosopher. We will take an instance from the First Book of the *Republic.*[1] He is seeking to disparage justice as defined by his opponents, and argues as follows:

"Is not he who can best strike any kind of blow, whether fighting or boxing, best able to ward any kind of blow.

"Certainly.

"And he who can prevent or elude a disease is best able to create one?

"True.

"And he is the best guard of a position who is best able to steal a march upon the enemy?

"Certainly.

"Then he who is a good keeper of anything is also a good thief?"

"That, I suppose, is to be inferred."

"Then if the just man is good at keeping, he is good at stealing money?"

"So the argument declares."

"Then, the just man has turned out to be a thief."

Example is a method of argument that we all of us are constantly employing, and are too often misled by

[1] Plat. *Rep.*, Bk. I. (Jowett's translation, Vol. III. p. 201.)

it. Of all fallacies the commonest is that of hurrying to an unfounded conclusion from one or more instances, or of arguing from the existence of some circumstance in one instance of a phenomenon to the existence of the same circumstance in another instance presented to us. The infant who looks out of the window and on seeing a man pass by in a black coat and hat cries out, Dadda!; the too credulous invalid, who, because he has swallowed a box of patent pills and afterwards recovered, attributes his recovery to the pills; the cynic who condemns all ministers of religion as insincere, because he has on one or two occasions met with a clergyman who did not live up to his profession; the traveller who denounces the dishonesty of a country, because he has once been cheated during a passing visit there; the superstitious of all kinds, who attribute good luck to horseshoes nailed over their door, or ill-luck to their having seen a magpie or walked beneath a ladder; all these and ten thousand more are fallacies of Example or Imperfect Induction. They leap from a single instance, or a handful of instances, to a universal conclusion, often forgetting or leaving out of sight the cases that are fatal to their too hasty generalization.

But are there never cases in which we can follow this convenient and rapid process which satisfies itself respecting a universal law from one or two instances casually encountered? Must we always pursue the painful and laborious process of Induction and its elaborate methods before we can assert even the probability of the universal law? We shall

have a word to say on this subject when we come to the question of hypothesis. The rapid generalization, so dangerous to all, is nevertheless within its own proper limits a most invaluable instrument of scientific research and discovery. To make such discoveries is one of the prerogatives of genius; there are some who possess a sort of natural instinct, an inborn power of detecting the general laws under the single instance, or under a number of instances so small that they would reveal nothing to the ordinary observer. Such men obtain their results by what Father Liberatore calls a sort of keen scent that enables reason to track its prey, and that is not acquired by teaching, but given by nature as a gift.[1] But the mass of men have to follow the steady and safe path of observation and experiment, employing as their guides the methods that Mr. Mill sets forth so clearly.

But has Example no logical force, no power to compel an opponent? Yes; it at least proves this, that the two qualities in question, the two circumstances common to each of the cases are not incompatible. When I argue that A and B are both X, A is Y, ∴ B is Y, I show that X and Y are at least compatible, and I am justified in drawing as my conclusion not B is Y, but B *may be* Y. Thus if I meet a Londoner and find him a vulgar, impudent fellow, I very much overstep the laws of reasoning if I conclude that all Londoners are vulgar

[1] "Obtinetur (hæc notitia) olfactu quasi venaticæ rationis, qui præceptis non acquiritur sed dono traditur a natura." (Liberatore, *Inst. Phil.*. I. 91.)

and impudent. The only inference I can draw from my observation is that cockneydom and vulgarity are not incompatible.

2. ANALOGY.—Analogy is clearly akin to Example, and indeed it is not always possible to distinguish between them. But properly speaking, Example argues from one instance to another similar instance in the same order: Analogy from one instance to another similar instance in a different order. If I argue from the fact that one man's body is liable to disease to the fact that the body of some other man is exposed to the same malady, I am arguing from Example. But if I argue from the liability of the body to disease to a similar liability on the part of the mind, I am arguing from Analogy; or to put the difference in another way, Example argues from an absolute identity in some particular, Analogy from an identity of ratios.

Example may be stated mathematically as follows:

A *and* B *are both* X;
A *is* Y;
*Therefore* B *is* Y.

Analogy will have a different formula:

A : M :: B : N
A *is* Y;
*Therefore* B *is* Y.

Angels and men, for instance, have an absolute identity in this, that they are creatures of Almighty God. If from this characteristic common to both I argue that because men are dependent upon God,

so are angels also, I am arguing from Example, and my argument may be stated thus:

*Men and angels are alike creatures of God*
*Men are dependent on their Creator;*
∴ *Angels also are dependent on their Creator.*

But angels and men have also a proportional identity, in that angels have in the spiritual world a subordination to the archangels, which corresponds to and has a certain proportion to the subordination of priests to their bishops. If I therefore argue that because a priest is bound to obey his bishop in matters pertaining to his office, so is one of the lower angels bound to obey an archangel, I am arguing from Analogy, because I am not arguing from a common fact but a common relation or proportion, and my argument will be:

*Priests : Bishops :: Angels : Archangels;*
*Priests are bound to obey their Bishops;*
*Therefore Angels are bound to obey Archangels.*

If Example is prone to mislead, much more is Analogy. It adds to the weakness of Example the further weakness of a transference to another order of things, which may be governed by altogether different laws. If a man points out that in the physical world beauty implies variety, and that a monotonous uniformity is destructive of all true grace and loveliness; and then goes on to deduce from this premiss the beauty of a divergence in religious beliefs, representing the countless varieties of Protestantism as more attractive than the uniformity of belief in the Catholic Church, we answer

him that to argue from the sphere of sense to the sphere of intellect is always untrustworthy, and that you might as well argue that because in the physical world of sense we test the reality of physical objects by their resistance to our bodily senses, therefore some such resistance is necessary to test reality in the world of intellect.

When we argue from Example we are said to *illustrate* our thesis: when we argue from Analogy it is not *illustration* but *metaphor* that we employ. A preacher is urging on his audience the advantage of imitating the saints. He enforces his counsel both by illustration and by metaphor. He illustrates his advice by cases of those who have imitated the saints with the most happy results; of St. Augustine reading of all that the heroes of the early days of Christianity had done and suffered for God, and saying to himself: "If they could do all this, why not I?"; of the sentinel, who watching the holy Martyrs of Sebaste frozen to death in the icy lake for the love of Christ, was moved by grace to strip off his uniform and plunge into the water to take part with them; of St. Louis of France, trained up to be a saint by the example of his holy mother, Queen Blanche.

All these are arguments from Example, and put in logical form would be:

*St. Augustine, the sentinel at Sebaste, St. Louis, &c., became great saints;*

*But St. Augustine, the sentinel at Sebaste, St. Louis, &c., imitated the saints;*

∴ *All who desire to become saints must imitate the saints*

Or the preacher may employ metaphor and say: "We sometimes see a herd of deer at a river's brink, longing to cross to the rich pastures which lie beyond it, but fearing to plunge into the stream. But when at length one larger and nobler than the rest shakes his branching antlers, as if in defiance of the danger, and fearlessly leads the way, the timid herd take confidence and boldly follow their monarch and their leader, so we see some great Saint who boldly encounters the trials and dangers that frighten ordinary men, and emboldened by his example, others venture into the painful waters of hardship and self-sacrifice which without it they would never have dared to enter, and thus reach the rich pastures of a holiness reserved for those who are willing to suffer and to labour for God," &c. Here we have an argument from Analogy:

*Deer and men are both prone to follow a leader;*
*Deer attain to richer material pastures by following a leader superior to themselves;*
∴ *Men may reach richer spiritual pastures by imitating the noble example of men who are spiritually superior to themselves.*

If the object of Induction is to persuade and make things clear to the mass of men rather than to convince or enforce an argument, much more is this the case with both Example and Analogy. Sometimes an apposite illustration or judicious metaphor will have a greater influence than the most logical of deductive arguments, and will convince the intel-

lect through the medium of the will. But here we are encroaching on the field of Rhetoric.

Has Analogy any strictly logical force? As an answer to an objector, it sometimes has a real value such as the strict Laws of Thought recognize and approve.

If a non-Catholic urges the indifferent or immoral lives of some Prelates or Popes as an argument against the truth of the Catholic Church, the obvious answer is to point to the evil life of Judas Iscariot, and to remind the objector that this was no argument against the truth of the doctrine of our Lord, or the authority of the Apostolic College. The argument would take the following shape drawn out in syllogistic form:

*The contrast between the belief and the practice of Judas Iscariot did not prove the doctrine he professed to be false;*

*But Judas Iscariot had the same relation to the Apostles of Christ that any Prelate or Pope, whose practice should be at variance with his belief, would have to the followers of the Apostles;*

∴ *The contrast between the belief and the practice of any Prelate or Pope is no argument against the teaching of the Catholic Church.*

In this case the logical force of the argument depends on the admission that the position of Judas amongst the Apostles was similar to that of a Prelate or Pope of evil life amongst the followers of the Apostles, and this granted, the conclusion that follows from it will be granted also.

## CHAPTER VIII.

### ON THE MATTER OF THE SYLLOGISM.

**Matter of the Syllogism—Demonstrative Syllogisms—Probable Syllogisms—Sophisms—Metaphysical, Physical, and Moral Certitude—Opinion, Doubt, and Error—Science and Demonstration—Physical Science—Various kinds of Demonstration—Probability, Certainty, and Certitude—Converging Probabilities—Weakness of Probable Arguments—Cumulative and Chain Evidence.**

WE have already said that our present treatise is one of Formal Logic, and that if we limit Formal Logic to what the word strictly means, we shall be obliged to admit that the *matter* of the Syllogism lies completely outside its sphere. But such a restriction is one that cannot be adhered to without considerable inconvenience, and the name of *Formalism* in its most uncomplimentary sense rightly belongs to any attempt to exclude from our treatise all possible considerations of the matter of our arguments.

Thus we cannot grasp the difference between Ancient and Modern Induction without at least a short consideration of the material side of Reasoning. If it is the function of Logic to direct the mind in taking cognizance of Truth, we cannot pass over the difference between various kinds of syllogisms, which vary not in the legitimacy of their inference but in the character of their premisses.

Among forms of argument in which the conclusion follows logically from their premisses, some we can accept with firm and unhesitating confidence, while to others we can only yield a qualified assent, or perhaps no assent at all. This is not owing to any variation in their form, all may be alike syllogisms in Barbara or any other legitimate form. It simply results from the nature of the premisses.

When the premisses are certain, we have the king of reasoning called *Demonstration*, and the syllogism is called the Demonstrative Syllogism; of this there are two kinds:

I. DEMONSTRATIVE SYLLOGISMS.—(*a*) *A priori:* When the premisses are *absolutely* certain and are necessitated by the very nature of things, we have *Demonstration a priori*, and the syllogism expressing it is said to be *absolutely* demonstrative, *e.g.*,

*All equiangular triangles are isosceles;*
*All isosceles triangles have the angles at the base equal;*
∴ *All equiangular triangles have the angles at the base equal.*

(*b*) *A posteriori:* When the premisses are *physically* or *morally* certain, and are necessarily true as long as the present order of nature goes on undisturbed, and the nature of man remains the same, we have *Demonstration a posteriori*, and such a syllogism is said to be only *conditionally* not *absolutely* demonstrative, *e.g.*

(1) Major premiss physically certain:

*All fruit-trees flower;*
*The banana is a fruit-tree;*
∴ *The banana flowers.*

(2) Major premiss morally certain:

*What is vouched for by all travellers to China is a geographical fact;*
*The existence of Pekin is vouched for by all travellers to China;*
∴ *The existence of Pekin is a geographical fact.*

II. PROBABLE SYLLOGISMS.—When the premisses are not certain but only more or less probable, then we have only a probable argument, and the syllogism is said to be a *Probable Syllogism*, as

*Wicked men are unhappy;*
*Nero was a wicked man;*
∴ *Nero was unhappy.*

*All the phenomena of light are explained by the undulatory theory;*
*The colouring of the woods on the Hudson River is a phenomenon of light;*
∴ *The colouring of the woods on the Hudson River is explained by the undulatory theory of light.*

III. SOPHISMS.—When the premisses are such that from them a false conclusion is drawn, without however violating the rules of the Syllogism, such a defect in our reasoning is called a *Fallacy* or *Sophism.*[1]

[1] This strict meaning of the words is not always adhered to Fallacy is often used to include both sophism and paralogism.

All sophisms are based on the *matter* not on the form. When the defect lies in the form we are said to have what is called a *Paralogism*, an argument false in form, a syllogism which is only apparent and not real.

Before we consider these various kinds of Syllogisms we must briefly explain the various states of mind which they severally produce, leaving the fuller consideration of these to the volume of our present series which deals with the First Principles of Human Knowledge.

1. When an argument is rightly drawn from premisses which are certain, the state of mind produced is *Certitude*, which may be defined as *a firm assent to some object of knowledge without any fear of going wrong*.

But as the premisses can be certain with absolute (or metaphysical), physical, or moral Certainty, so the certitude they produce will be absolute (or metaphysical), physical or moral. We are certain with *absolute* certainty that two and two make four. We are certain with *physical* certainty that the stone which I throw upwards will fall again to earth. We are certain with *moral* certainty that Julius Cæsar was the first Roman Emperor.

In all the three cases there is a complete exclusion of the possibility of the opposite being true, but metaphysical certainty is nevertheless on a different level from the other two. It is so bound up with the Divine Nature that God Himself could not interfere with it. No exercise of the

Divine Omnipotence could make five out of two and two, or cause the exterior angle of any triangle to be less than the interior or opposite angle. God could not create a world in which the theory of Hegel respecting contradictions would be true, or Kant's doctrine of antinomies, or Mill's denial of the necessary universality of the laws of the *a priori* sciences.

But it is very different with physical or moral certainty. A doctor is physically certain that an ulcerated sore cannot be healed in a day, or an ovarian tumour disappear, or sight be restored on a sudden to eyes that have received an organic lesion of the retina. Yet all these wonders have been worked at Lourdes, and the evidence is so indisputable that no man in his senses who carefully investigates it can deny the facts. Hence Physical Certitude is, as we have said, only conditional, not absolute. The Author of Nature's laws can at any time set them aside or suspend their operation if He pleases, and He does from time to time and will continue to do so as long as the world lasts.

There is, moreover, another reason why our certitude about the laws of nature is only conditional. They are not like the inner laws of Being, stamped upon our intelligence so that they have only to be once brought before us to be recognized at once as universally and unconditionally true. They are arrived at by a long process of observation and experiment, and are (as we have already remarked) nothing more than hypotheses which long experience justifies us in regarding as universally true. The law of gravity, certain as it is, certain with all

the certainty of which any *a posteriori* law is capable, is only an hypothesis verified by the universal experience of mankind for seven thousand years, and by every sort of experiment of which scientific men are capable.

In the same way *moral* certainty depends on the character and dispositions of mankind, such as they are known to us by experience. We know for instance that lying for lying's sake is against nature. Men in their sound senses, whether good or bad, will not deceive their fellows, as long as there is no advantage to be gained by doing so. It is a law of human nature that word and thought correspond. It is again a law of nature that habit enables us to do easily what is difficult at first, or that education refines the character, or that men naturally seek after happiness; and in our actions we are perfectly safe in acting on these laws as certain. Nevertheless there is nothing contradictory in the supposition that a tribe might exist who lied for lying's sake without any view to gain; or a race of men with whom frequent repetition of an act did not lead to the foundation of a habit, and so on. Hence they are not true absolutely and *a priori*, but only conditionally and *a posteriori*, the condition being, as long as human nature remains what it is at present.

2. When an argument is rightly drawn from probable premisses, the state of mind induced is called *Opinion*, which may be defined as *adherence or assent to one of two opposite statements with a certain fear lest the other alternative be true.* Thus it

is my opinion that Socrates was a good and conscientious man, although I am not altogether free from a fear of the opposite, especially when I read certain Dialogues of Plato. It is my opinion that Romulus was the first King of Rome, though the treatment of him as a mythical personage by some learned historians prevents me from being certain of his existence. It is my opinion that earthquakes are caused by the upheavings of the igneous contents of the earth, but I am not sure about it, and am ready to accept any other explanation of them if it shall be established by scientific men.

When I have such a dread of the opposite that I do not venture to express myself either one way or the other, then my state of mind is no longer opinion, but *Doubt*. For instance, I doubt whether the use of gas in the place of candles and lamps has been a real advantage to mankind or not; whether it is desirable that the civil government should interfere in education; whether Savonarola was justly put to death, &c. In these cases I recognize a great deal to be said on both sides of the question, and cannot give my assent to either.

When I have no sufficient data to form an opinion at all, then my state of mind is not Doubt, but *Ignorance*. For instance, I am ignorant of the state of education in China, of the state of politics in New Mexico, of the causes of the various changes in the weather, and of a million questions more.

3. When an argument is drawn from false premisses, or is wrongly drawn from true principles,

then the state of mind of him who accepts it is *Error*, which may be defined as *a discrepancy between the judgment formed by the mind and the object respecting which it is formed.* Error is very different from ignorance, though it implies the presence of ignorance and arises from it. For ignorance is something negative, it expresses the absence of knowledge, but does not imply the formation of a judgment respecting the matter of which we are ignorant; whereas error implies the further step of forming a judgment, and that judgment a mistaken one.

Hence we have three states of mind: *Certitude*, the offspring of what we have called the *Demonstrative* Syllogism, *Opinion* of the *Probable* Syllogism, and *Error* of the *Sophistical* Syllogism.

We must now return to our consideration of these various kinds of Syllogisms.

I. DEMONSTRATIVE SYLLOGISMS.—A Syllogism which produces Certitude proceeds by way of *Demonstration.* We are all familiar with the phrase: "I can prove this to demonstration," which means, I can prove this from premisses which are certain, and which no man can reasonably doubt.

Demonstration therefore may be defined as *an argument in which the conclusion is logically drawn from premisses known to be certain.* It does not differ in its form from all other modes of argument, but in its matter. Moreover it always proceeds either immediately or mediately from premisses incapable of demonstration, from self-evident propositions of which no proof is possible, whether it proceeds

downwards from First Principles, or upwards from individual facts.

The end of demonstration is *Science*, which may be defined as *a certain knowledge of the truth, arrived at by demonstration.* It deals with conclusions, not with the principles from which those conclusions are ultimately derived, since we are said to *apprehend* First Principles rather than to have a scientific knowledge of them. Science does not teach us that things equal to the same thing are equal to one another, or that every effect must have a cause. First Principles are more certain and better known to the human intellect than the conclusions drawn from them, since our knowledge of them is *immediate*, our knowledge of conclusions only *mediate*.

Science, properly speaking, is in its highest sense a knowledge of things that are *metaphysically* certain by reason of their inner nature, of things that are necessary and cannot possibly be otherwise. But in a wider sense science is used of a knowledge of things that are only physically or morally certain, the truth of which knowledge depends, not on the inner nature of things, but on the physical or moral laws that govern the world, laws which might be reversed by Almighty God at His good pleasure. Thus, the knowledge that all the angles of a triangle are together equal to two right angles, is scientific knowledge in the strict and accurate sense, but the knowledge that the flame of the candle will burn me if I thrust my hand into it, is scientific knowledge in the wider and less accurate sense of the term.

Each of these propositions is the conclusion from a general proposition. In the former case the conclusion is deduced from a mathematical axiom, viz., "Things which are equal to one and the same thing are equal to one another," in the latter case from an *a posteriori* proposition based upon observation and experiment, and only physically certain. To reverse the former law and the consequence flowing from it is beyond the power of God Himself in the present order of things. To prevent the action of the latter law and the consequence flowing from it, is not only within the power of God, but it has repeatedly been done by Him in favour of His servants, or to manifest His power.

This suggests a passing remark respecting the strange perversion of language by which *science* is confined by modern usage to *physical* science, and *scientific* to that which is concerned with what only deserves the name in a secondary and inferior sense. We do not refuse the word science to that branch of human knowledge which deals with nature's laws, but to regard this as the only, or even as the primary meaning of the word, is one of those degradations of human speech which bears unconscious testimony to the degradation of the minds that frame the speech. Science is, with our modern scientists, no longer the knowledge of Divine things, no longer the acquaintance with the immortal and immaterial part of human nature, no longer the search after the eternal and immutable. It is the knowledge of things corruptible, the acquaintance with the brute matter doomed to perish, the research into the

various phenomena of which the dirt and dust of earth is capable.

Science being the end arrived at by demonstration and the demonstrative syllogism, we have divisions of Demonstration corresponding to the various uses of the word Science.

1. Demonstration *a priori* proceeds from universals to particulars, from first principles to the conclusions following from them, from causes to effects.

Demonstration *a posteriori* proceeds from particulars to the universal, from the results of principles to the principles themselves, from effects to causes.

Thus, if I argue from the immutability of God to His eternity, I argue *a priori*, and my syllogism is as follows:

*All immutable things are eternal,*
*God is immutable,*
∴ *God is eternal.*

But if I argue from the dependent and contingent character of things created, to the existence of an independent and necessary Being, who is their Creator, I am arguing *a posteriori*, and my syllogism will be:

*All things dependent and contingent imply the existence of a Being on whom they depend,*
*All created things are dependent and contingent,*
∴ *All created things imply the existence of a Being on whom they depend,*

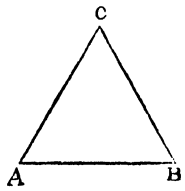
where my argument proceeds from the effects to their efficient cause.

2. Demonstration is also *pure*, *empirical*, and *mixed*.

Pure Demonstration is from premisses, both of which are *a priori*, as in Mathematics.

Empirical Demonstration is from premisses, both of which are *a posteriori*, as in Chemistry and the physical sciences.

Demonstration is said to be mixed when the Minor premiss applies to the real order what the major premiss asserts of the ideal, *e.g.*,




*All plane triangles have straight lines for their sides,*
A B C *is a plane triangle,*
∴ A B C *has straight lines for its sides,*

where in point of fact A B, A C, B C, are none of them either straight or lines, however carefully the triangle be drawn. Nevertheless the mind forming to itself the idea of a plane triangle and the idea of a straight line from the imperfect representations of them, rightly judges respecting A B C what is, strictly speaking, only true of the ideal it copies.

3. Demonstration is also *direct* and *indirect*.

In Direct Demonstration we show our conclusions to be true by positive arguments.

In Indirect Demonstration we show our conclusions to be true by showing the absurdity of every other alternative. This latter is also called *reductio ad absurdum*.

We have an instance of the former in the large

majority of propositions of Euclid; of the latter in those propositions in which he begins, "If it be possible, let," &c.

Indirect Demonstration is always inferior to direct. It does not lead the mind straight to its mark or leave it so fully satisfied, but takes it by a roundabout way. There is always a latent fear lest there may be some weak point in the conditional premisses which give the various alternatives; and we suspect either that there is some further possibility beside those enumerated, or else that one or other of those adduced does not lead to the absurdity attributed to it, or that they may not be exclusive of one another.

4. Demonstration is also divided into *absolute* and *relative*.

Absolute Demonstration proceeds from premisses that are true in themselves.

Relative Demonstration proceeds from premises which are agreed upon between myself and my adversary, without taking into consideration whether they are true or not; as when I prove the sceptic to be wrong by assuming his own premisses, and showing him from them how he is at variance with himself.

II. PROBABLE SYLLOGISMS.—As the Demonstrative Syllogism leads to certainty, so the Probable Syllogism leads to opinion. St. Thomas[1] remarks that the operations of human reason have their counterpart in the processes of nature. There are

[1] Lect. i. in *Post. Anal.*

some things in which nature acts as of necessity, and which invariably produce the same results. There are others in which she generally, but not always, pursues the same course. Thus, if we sow a seed in the ground, we generally see it under normal circumstances grow up to a perfect plant, but this is not always the case. Our seed may never come up at all, or may never attain maturity. In the same way our mind sometimes draws a conclusion as of necessity and without any hesitation. At other times it draws a conclusion which is true in a majority of cases, but is not necessarily true. In the former case the mind proceeds by means of the Demonstrative Syllogism and attains to scientific certitude; in the latter the mind proceeds by means of the Probable Syllogism and attains to probability.

*Probability* may be described as an approach to truth. Truth is, as we have seen above, a conformity of the mind with the object known. Probability, then, is an approach to this conformity. In Probability, then, are countless different degrees, varying from the highest to the lowest, from a very near approach to certainty to the greatest improbability. Just as in natural things (we borrow again from St. Thomas) nature may be stronger or weaker, and according to her degree of strength is her success in attaining to the end aimed at, so in all processes of argument that fall short of certainty, the mind approaches near to or withdraws further from the condition of certitude, according as it attains to propositions which appear to have a larger or smaller

conformity to truth. But however high the degree of probability attained to, the mind cannot be said to have scientific knowledge so long as it does not pass beyond the probable, since in all probability there is a certain dread of the alternative opposite to that towards which we ourselves incline. Truth does not consist in the combination of a number of probabilities, or certainty of a number of probable opinions all tending to the same point.

Nevertheless we must be on our guard here lest we confuse together certitude and certainty. It is true that certainty can never consist of probabilities united together, but certitude may be produced in the mind by the effect of such a union of probabilities. *Certainty* is something objective, and is concerned with the nature of the proposition in itself. *Certitude* is subjective, and is concerned with the state of mind of one before whom the proposition is placed. Now when any proposition has in its favour a large number of converging probabilities, the effect upon the mind of any reasonable man is to produce a real kind of certitude. He is morally certain that the proposition is true, using the phrase "morally certain" in its proper and true sense, as meaning that he has no dread lest the contradictory be true, as long as the nature of man remains what it is.

An example will make my meaning clearer. I see in a New Zealand paper the announcement of the death of a man whose name is that of an old University friend and companion of my own. The name is a common one, it is true, but I know that

my friend emigrated, though I never heard where he went. I begin to wonder whether it is really my friend who is dead. A few days afterwards I meet a mutual acquaintance of both of us, who tells me that he has just received a letter stating that so-and-so (mentioning my friend) died suddenly abroad. Not long afterwards I pass a brother of the man reported to be dead and observe (I have no opportunity of speaking to him) that he has a mourning-band round his hat, such as would be worn for a brother or sister. Now each of these sources of information does not give anything more than probability. It is very possible that there may have been in New Zealand another man of the same name as my friend, not to mention the chance of a mistake in the newspaper. The report that reached our mutual acquaintance may be a mistaken one, and my friend's brother may be in mourning for some other relative. Yet I feel certain that my friend is dead, and I think that under such circumstances any ordinary man would feel sufficiently certain to take practical action, if such action depended on the report being true. The combination of probabilities produces certitude, not the highest certitude, not absolute certitude, but moral certitude. It does not merely produce a high degree of probability.

In the same way, I suppose every one would allow that a jury ought not to declare a prisoner guilty, unless they are quite certain of his guilt. Yet in nine cases out of ten the evidence consists of probabilities, and that even where it is not only

circumstantial but direct. A man is tried for robbery and violence. The prosecutor swears to his identity, he is found with purse and money in his possession, and he is a man with several convictions recorded against him. Under those circumstances what jury would not convict, and rightly so? Yet the prosecutor may have made a mistake, the thief may have picked up the purse in the street, or may have had a similar purse of his own, and as to his character, this affords a very feeble presumption of his guilt on this particular occasion. Yet the combination of probabilities produces, on the mind of jury and judge alike, a sufficient certitude to make them perfectly certain of the prisoner's guilt, sufficiently certain to pronounce him guilty without any need of deliberation.

What should we say to a juror who, after the trial was over and the man condemned, were to feel scruples as to the verdict passed, or worse still, who were to starve out the other eleven on the ground that it is still possible that the prisoner is innocent, and he ought to have the benefit of the doubt? We should answer him that his doubt was what is called an imprudent doubt; that it is *absolutely* possible that the whole matter was a mistake, but that it is not *morally* possible, when we take into account the credibility of ordinary witnesses, the tendency of a man once convicted to commit some other crime, and the general reliance that can be placed on a man's identification of his own property; so that we can have no reasonable doubt, and are morally certain of the prisoner's guilt.

To return to the Probable Syllogism. It is one in which one or other of the premisses is a general probability, not a certain fact. The orator argues for the most part from Probable Syllogisms, and the Probable Syllogism is almost identical with the Rhetorical Syllogism, which is drawn, as Aristotle tells us, from probabilities and things which are an indication of the conclusion (ἐξ εἰκότων καὶ σημείων). We have already spoken under the head of Enthymeme of the general coincidence of the Rhetorical Syllogism and the Enthymeme, and of the frequent coincidence of the Probable Syllogism and the Enthymeme. The three in fact form a sort of happy trio who are rarely separated, and, though each has a separate *pied-à-terre* of his own, yet they are usually found united into one.

The degree of probability of the conclusion is exactly the same as that of the probable premiss. But when both premisses are probable, it represents the combined weakness of both. Thus in the syllogism,

*Most Hindoos are courteous,*
*This man is probably a Hindoo,*
∴ *This man is probably courteous,*

the probability of his displaying the courtesy of the Hindoo is comparatively small. If, for instance, Hindoos are polite in three cases out of four, and the chance of this man being a Hindoo is three to two, nevertheless it is more unlikely than likely that we shall find in him the politeness we desire.

Few dangers are more fatal to sound reasoning

than the assumption of probable premisses as certain. A few probable premisses in the course of an argument may render the final conclusion very improbable indeed. If in a long argument I take for granted six times over a premiss that has two to one in its favour, the weight of evidence against my final conclusion will be nearly ten to one.

Sometimes we have a number of premisses thus depending on one another. In this case the conclusion represents the combined weakness of all of them. For instance, a man is accused of murder. There is very strong evidence that a man just like the prisoner was in the company of the murdered man on the night when the murder was committed. It is also *almost* certain that the man who was known to be in his company did the deed. There is, moreover, a strong presumption against the theory urged by the counsel for the defence, that the deceased made an unprovoked attack on his companion on the night in question and met his death from him in self-defence. But it does not follow that the accused should be convicted of murder. For if the probability of each of the three circumstances pointing to guilt is three to one, the balance of probability is nevertheless rather against than in favour of their being all of them true, and this means that it is more likely that the accused was innocent than that he was guilty.

This kind of argument is sometimes called *Chain* evidence. It has two laws which govern it.

1. The chain is never stronger than its weakest link, *i.e.*, the conclusion is never stronger than

the weakest of the premisses. All the propositions in the series save one may be absolutely certain, but nevertheless the final conclusion is not a whit stronger than the one which has in it signs of weakness.

2. The conclusion represents the combined weakness of all the premisses. Even though each of the probable premisses may have a moral probability approaching to certainty, nevertheless, if they are many, the conclusion may be very improbable indeed.

*Chain* evidence must be carefully distinguished from *circumstantial* evidence, of which we gave two instances above. In the latter, the conclusion represents the combined strength, not the combined weakness of the premisses. Each of them strengthens the rest, and their combined strength may be such as to justify moral certitude. They may when taken separately have even a low degree of probability, but when united together may afford an incontrovertible proof of the conclusion to which they point.

# CHAPTER IX.

## ON FALLACIES.

Formal and Material Fallacies.—I. Fallacies of Language—Equivocation—Amphibology—Fallacies of Metaphor—Composition and Division—Fallacies of Scepticism—Fallacy of Accent II. Fallacies outside Language—Fallacy of Accident—Its Frequency—Fallacy of Special Conditions—Evading the Question—Instances of Evasion—*Argumentum ad hominem*—*Argumentum ad populum*—*Argumentum ad verecundiam*—Fallacies of Causation—Faulty Inference—Begging the Question—Arguing in a Circle—Fallacy of Questions.

We are now approaching the end of our task. In our last chapter we stepped a little outside of the sphere of Formal Logic to speak of the *matter* of the Syllogism, and we discussed Demonstrative and Probable Syllogisms. We glanced at the various kinds of Certitude, explained the strict meaning of Opinion and Doubt, and Error. We then explained the various kinds of Demonstration, and how we can only arrive at scientific knowledge through the medium of Demonstration.

We have to discuss in our present chapter some of the more common sources of Error.

Whenever we neglect any of the Laws of Thought, or of the principles which ought to be observed in our reasoning processes, the defect is called a *Fallacy*. The term is generally applied to such a flaw in

reasoning as is not at once patent to the ordinary observer, but in some ingenious manner counterfeits the appearance of truth, and for this reason is liable to mislead the incautious.

A *Fallacy* then is any incorrect argument which imitates in some way or other the appearance of truth.

As we distinguish in every syllogism the form and matter, so the incorrectness of a fallacy may be either *formal* or *material*. When it is formal, that is, when it is in the form or shape of the argument, the syllogism is no syllogism at all, but a *paralogism*, or a false or apparent syllogism. Thus if I argue:

*All comets have a fiery tail,*
*No peacocks are comets,*
∴ *No peacocks have a fiery tail,*

the premisses are true and the conclusion is true, but the argument is an incorrect one in form, and the conclusion does not follow from the premisses.

When the incorrectness of the argument is to be found not in the *form* but in the *matter* of the syllogism, the fallacy is a *Sophism*, and the syllogism called a *Sophistical Syllogism*. If we take a purely mechanical view of such a syllogism, examining it by the rules given above, and using the terms merely as counters, we shall find no flaw in it, whereas in the paralogism the object will appear at once quite independently of the meaning of the premisses or force of the terms.

Material fallacies lie either in the words used or form of expression, the same words or expressions

being used in a different sense in the two premisses, or in one of the premisses and conclusion respectively, or in the things spoken of, points of difference being overlooked or points of agreement ignored. Where the fallacy lies in the words, it is said to be *in the diction* (*in dictione*); when it lies in the things spoken of, it is said to be *outside the diction* (*extra dictionem*).

I. FALLACIES OF LANGUAGE.—Fallacies *in dictione* or in the language are divided into six classes:

1. Fallacies of *Equivocation*, when the same word is used in a different sense in different parts of the argument, which, however, proceeds as if these senses were the same, as,

*He who is outside the Church of Christ cannot be saved,*
*All who hold any heretical doctrine are outside the Church of Christ,*
∴ *None who hold any heretical doctrine can be saved,*

where I am using Church in the major premiss for the *soul* of the Church, which consists of all who are united to Jesus Christ by faith and charity, and in the minor premiss for the *body* of the Church, *i.e.*, the external body consisting of those who are united by one Faith under the Vicar of Jesus Christ upon earth.

Again,

*It is impossible to be in two places at the same time.*

*There is a story of St. Philip that he was in two places at the same time,*
∴ *There is a story of St. Philip that he did what was impossible.*

This argument is well enough as far as it goes, but if in the conclusion I use *impossible* in the sense of what cannot possibly happen, and therefore disbelieve the story, I am liable to the charge of *equivocation,* in that I have used the word impossible in the major premiss for physically impossible, which impossibility does not exclude a miracle, and in the conclusion for absolute impossibility, which no miracle can set aside.

We must give one or two more instances of this frequently occurring fallacy, *e.g.*,

*Indifference is a high degree of virtue,*
*He who says all religions are equally good exhibits a complete indifference,*
∴ *He who says all religions are equally good exhibits a high degree of virtue,*

where indifference of the will or that conformity with the will of God which implies a total absence of self is treated as identical with the indifference of the intellect, or a suspension of judgment where there is an obligation to come to a decision.

*He who calls any man on earth Father sins against Christ's command,*
*A child speaking to his parent calls him Father,*
∴ *A child speaking to his parent sins against Christ's command.*

Here the command of Christ, "Call no man Father upon earth," is treated as if it forbade children to acknowledge their parents.

*All able men are consistent with themselves,*
*He who changes his opinions is not consistent with himself,*
∴ *He who changes his opinions is not an able man,*

where *consistent* in the major premiss refers to opinions held together and at the same time, while in the minor premiss it refers to opinions held at different times.

2. *Amphibology*, where the ambiguity lies not in a word, but in the sentence, the grammatical construction being doubtful, or the expression used admitting of different explanations.

*If there is no possible difficulty which justifies absence at Mass, the law enjoining attendance is cruel and severe,*
*But to-day there is no possible difficulty which justifies our absence from Mass,*
∴ *The law of the Church is cruel and severe,*

where the words *no possible difficulty*, &c., are ambiguous.

This instance is an obvious catch, but there are dozens of cases occurring every day in which we are taken in by the sophism of Amphibology. When the duty of Bible-reading is established on the words of Our Lord, "Search the Scriptures," the well-meaning argument is weakened by the fact that the words in the original are *Ερευνᾶτε τὰς γραφὰς*—

"Scrutamini Scripturas," and that the context is, in the opinion of many scholars, in favour of this being the indicative mood. When the words of St. Jude[1] respecting the Cities of the Plain that they "were made an example, suffering (the) punishment, of eternal fire," are used as showing that the word eternal is used in the Bible for a mere passing conflagration, they forget that the meaning probably is, that they were made an example (or type) of eternal punishment in the penalty of fire inflicted on them.

Or to turn from sacred to profane, Shakespeare's words:

> The Duke yet lives that Henry shall subdue,

are a good instance of constructional ambiguity. If a man were to be branded as a parricide because it was said of him, "This man his father killed," we should have first to inquire whether the ambiguous phrase did not mean that he was slain by his father. The student of Æschylus and Thucydides will remember instances, not a few, of amphibology. The oracles of old often resorted to it, and the modern fortune-teller finds it a convenient resource. The atheist who justified his dogmatic and open attacks on God by quoting the words that the fool said *in his heart* that there is no God, as meaning that the philosopher proclaims it *aloud*, perverted the Sacred Text by amphibology. Riddles and witticisms are often based on this fallacy, which is the necessary result of the imperfections of human language.

[1] St. Jude 7.

There is no form of this more common than the confusion between the literal and the metaphorical meanings of language, between the straightforward sense of the words and some derived meaning which may be discerned behind them. It is very easy indeed for any one who takes detached passages of a speech or a letter to distort their meaning. When Our Lord says to His Apostles, "Salute no man by the way,"[1] such a command might by itself be accused of extreme discourtesy, until we learn from the word translated "salute" (ἀσπάσησθε) that what was to be avoided was the making of acquaintances, and that the whole phrase is a hebraism, and indicates a rapid journey.[2] Many conventional phrases are instances of amphibology. "Not at home," for instance, as a softened form of refusal; or, "I do not know," as an equivalent for I have no knowledge that I can communicate to you.

Metaphor is the natural resort of all who desire to be obscure, or to veil their meaning from some of those who listen to them. Our Lord's teaching to the multitude was, as He Himself tells His disciples, couched in the form of parables, because they had a meaning for His friends which He desired to hide from His enemies. The symbolic teaching of the early Church concealed, under figures which the heathen could not interpret, the Divine Mysteries. Those who had the key to one or the other, understood them in the sense in which they were meant, but the stranger to the Faith gave them a false meaning, or no meaning at all.

[1] St. Luke x. 5. [2] Cf. 4 Kings iv. 29.

Prophecy, good or bad, often veils its meaning. The true prophet knows what he means; the false prophet aims at employing words which he can explain according to the event. The modern prophecy, "Howl, ye sons of Brutus: the lily shall leave the land of its captivity, and the great river shall run down to the sea red with blood," may be a true prediction, but it is suspiciously vague, and almost any great battle would furnish a respectable explanation of it.

3. The Fallacy of *Composition* consists in taking *collectively* what ought to be taken *separately*. The best practical instance of it is the delusion common to all who invest their money in lotteries. I receive from some German municipality an advertisement of a State loan or lottery of which the first prize is 200,000 marks, or £10,000. The second prize is £4,000, the third £2,000, and a number of others follow. Each share is only 5 marks, and I invest in 4 shares, and eagerly look out for the drawing, having a most inordinate expectation that out of so many prizes one at least of my four shares ought to be successful. But if I were to look at the matter accurately, I should find that the total number of shares is 100,000, and the total number of prizes (even counting the lowest, which are only £5) is 200, and therefore my chance of a prize is just 1,000 to 1 against each of my shares, or 250 to 1 against the four combined. In other words, if I invested £1 every year of my life in the lottery, the chance would be 5 to 1 against my getting a penny of my money back in the course of 50 years!

The source of this delusion is the Fallacy of Composition. I look at the money given in prizes in its collective character as a lump sum, instead of dividing it as I ought to do amongst the total of shares. The big sum dazzles me, the crowd of hungry investors is kept well out of my sight; I do not reckon up the enormous mass of those who invest and invest again, and all to no purpose. Perhaps, even after I have failed once and again, I go on clinging to the fond hope that it cannot be long before Fortune's wheel turns in my favour, and bestows on me the dangerous boon of sudden riches.

Every hasty induction involves the Fallacy of composition.

4. The opposite Fallacy of *Division* consists in taking separately what ought to be taken collectively. A man is being tried for murder. There is a cumulus of evidence against him quite sufficient to hang half a dozen men. The principal witnesses are four in number. One of them was present at the murder, and swore to the identity of the accused. Another had heard him vow vengeance. He was, moreover, apprehended with the pistol still smoking from which the fatal shot had been fired. Already more than once he had attempted the life of the deceased. Suppose one of the jurors were to urge that a verdict of "not guilty" should be returned, and were to give as his reason that the testimony of each of the witnesses admitted of an explanation compatible with the innocence of the accused, and that he ought to have the benefit of the doubt.

The first might be mistaken in asserting the identity of the accused; the second, who testified to his threats, did not prove that they were carried out, for such vows are rarely kept; while as to the smoking pistol, he might have fired it off by accident, or not known that it was loaded. The previous unsuccessful attempts on the life of the deceased would be rather an argument for his innocence, because no one likes repeated failures. No one can deny the possibility, at least the remote possibility, of each of these explanations being true, and each of the facts alleged without corroborative evidence would be quite consistent with the innocence of the culprit. Yet when taken collectively, they could leave no possible doubt in the mind of any reasonable man. He who takes them separately, one by one, dividing instead of combining, is guilty of the sophistical argument called the Fallacy of Division.

Or to take another practical instance. A certain number of miracles are reported to have taken place at a well-known sanctuary. Medical men of high repute attest their reality; other unimpeachable witnesses bear testimony to the suddenness of the cure. Those who bade the sick man farewell when he left his home, thinking that it was impossible that he should survive the journey, cannot believe their own eyes when he returns in perfect health. The case stands the test of time, and no attempt is made to set aside or invalidate the printed account which is submitted to the world for general criticism. Now, what is the manner of proceeding on the part of the sceptic when brought face to face

with a string of such miracles? He argues as follows: Of the seven miracles adduced, it seems to me that the first (a case of paralysis) may be explained by hysteria. It is not at all rare for an hysterical patient to fancy himself paralyzed, and anyhow the affection is one of the nerves, and any sudden shock or powerful influence may recall the nervous power that had been lost. In the second case, in which a tumour suddenly disappeared, it may be that the plunge into the cold water caused an almost instantaneous contraction of the parts affected. The third, in which cancer had been cured, our sceptic explains by saying that there may have been a false diagnosis on the part of the medical man attending the patient. The fourth, in which a needle that had been buried in the fleshy part of the thumb, and had defied the attempts of surgeons to reach it, suddenly appeared on the surface, and was easily drawn out with the hand, is explained as a curious coincidence. The needle, which had been gradually working its way towards the surface, had happened to show itself for the first time on the occasion of the visit to the fountain. In the fifth case our incredulous friend remarks that the medical witness is a Catholic, and that probably his faith obscured his scientific impartiality. The sixth he pronounces to be possibly due to some chemical influence in the water; while the seventh, which consists in the perfect restoration to soundness of a gangrened sore, our philosopher, driven to his last resource, allows indeed to be beyond any power of nature known to medical science in

the present day, but he declares it to be probably due to some mysterious and hidden forces of nature which up to the present time have been concealed from our eyes, though we may hope that further investigation may hereafter make them known to us, and so he despatches to his satisfaction all the seven.

But the good man forgets that his argument contains a very signal Fallacy of Division. He looks at these instances singly, and knocks them down or thinks that he does so one after another, never considering that those single sticks which he fancies he manages to break singly are really united into a sturdy staff which is unbroken and unbreakable.

We may put his fallacy into syllogistic form as follows:

*The first miracle cited admits of a possible explanation, also the second and the third, up to the seventh;*
*But the first, second, third, &c., are all the miracles cited;*
∴ *All the miracles cited admit of a possible explanation.*

5. The Fallacy of *accent* or *prosody* is one of which logicians remark that if any one is fool enough to be taken in by it, it serves him right (*quibus qui falli potest, debet*). It consists in mistaking one word for another which is pronounced like it, but written differently, as of a herald ordered to insert in the arms of some *nouveau riche* a *cerf rampant*, were to represent a tenant threatening his landlord. Or if a narrator were to declare that a battle was

fought in a district of France abounding in vineyards because it took place in a champaign country. Or else it confuses together two words written in the same way, but pronounced differently, as for instance, if I were to understand an author who said that some one traversed the character of the King as meaning that he went over it in detail; or if I accused a man of practising unlawful arts because he conjured his judges to have pity on him, and so on in an indefinite number of instances, which, however, for the most part, involve too obvious a fallacy to have any serious power to deceive.

6. The Fallacy of *figure of speech* consists in assigning to a word which has a certain grammatical form, characteristics which belong to it in virtue, not of its form, but of its meaning. This fallacy is one that is more liable to deceive those who are not conversant with more than one or two languages. Translation and re-translation, the habit of speaking and thinking in different languages, tends to obviate it. Still it is not altogether obsolete in the present day, at all events among schoolboys. The boy who argues that *tribus* must be masculine because words of the fourth declension are masculine, or that the *a* in *dare* must be long because all words of the first conjugation have *ā* before *re* and *ris*, falls into this fallacy. So, too, does he who says that all active verbs imply action, and therefore there must be some activity on the part of him who sleeps, since *sleep* is an active verb, else how could we sleep a sleep? A student of logic would fall into this fallacy if he in one of the premisses

employed a word in its ordinary sense, and in the other in what we call its *second intention*, as

*Animal is a genus;*
*This giraffe is an animal;*
∴ *This giraffe is a genus.*

II. FALLACIES OUTSIDE LANGUAGE.—Fallacies *extra dictionem*, or outside language, are those in which the fallacy lies, not in the form of expression, but in the idea of the objects about which we argue: when things which differ are regarded as the same, or the same things as different. They, like the fallacies of diction, fall under seven several heads.

1. *Fallacia accidentis*, where we confuse together the essential and the accidental characteristics of the object of our thoughts, whether it be a class or an individual.

Thus my acquaintance with swans has taught me to regard them as always (except in the early stages of their growth) as birds of snowy plumage. But one day I see a bird in the Zoological Gardens just like my river friends except that is is of a swarthy black, and my first impulse is to argue as follows:

*All swans are white;*
*This bird is not white;*
∴ *This bird is not a swan.*

If I commit myself to this syllogism I fall into a notable instance of the *Fallacia accidentis*. I have put down the accidental whiteness of the swans I have seen as their universal and essential characteristic.

This Fallacy of *accident* is a very common one in ordinary life. If I were to argue against a man in California being identical with one whom I had formerly known in Dublin, because my acquaintance was a Protestant, whereas the dweller in California is a good Catholic, I should fall into this fallacy. So too, if I allow myself to attribute to all Freemasons a hatred of the Catholic Church, or if I assert that all men who have had a University training are good scholars, or if I am so unfair as to be prejudiced against a man because in his youth he was guilty of some act of folly proceeding from generous impulse or passion, and not from any serious fault. Of this fallacy Nathanael was guilty when he asked: "Can any good thing come out of Nazareth?" The idea prevalent in England that all Americans speak with a nasal twang, and say "I guess," or "I reckon," in every sentence, and the corresponding American impression of an Englishman that he is burly, insolent, and rather wanting in intelligence, are other instances among many. In fact, almost every prejudice and misconception falls under or may be reduced to this wide-embracing fallacy.

2. The second Fallacy of those *extra dictionem* is called *a dicto secundum quid ad dictum simpliciter;* from a word used of some particular part of anything or with some other qualification, to the same used generally and without such qualification. The common instance given: *He has white teeth, therefore he is a white man,* is a very obvious instance, which could deceive none. But if we were to apply to a naturalist the epithet *learned* because he was

acquainted with the history, nature, appearance, and habits of every butterfly and moth on the face of the earth, we should run into this fallacy. We argue from the fact that a man is learned *secundum quid* (*i.e.*, in butterflies), to the further fact that he is learned when we use the word in a general sense for one possessed of all learning, or at any rate of all the learning we should expect in a learned naturalist. Of this fallacy all are guilty who judge that because a man is skilful in the material and physical sciences, therefore his words ought to carry weight when he lays down the law about things immaterial and spiritual, and that the lay sermons and addresses of one who has attained a just reputation by his careful observation of the irrational and mechanical creation, are worthy of being listened to when he deals with metaphysics and theology, and other subjects of which he is profoundly ignorant. He who concludes that school fights are to be encouraged because sometimes a bully may be suppressed by a challenge from one of his victims, would be justly condemned as a sophist, or he who should argue that all servants may help themselves to their master's goods because such action is justified in one who is deprived of the wages due to him, or he who should defend the position that a son may disobey his parents whenever he thinks proper, because under certain special circumstances disobedience is justifiable.

The opposite form of the fallacy, which argues from something generally true and undeniable to the same when some special condition is introduced,

is also a very frequent and often a very pernicious one. The teetotaller who refuses to give wine to the sick, even when the doctor orders it, on the ground that it is dangerous to take stimulants—or the parent who will not correct his pilfering child on the plea that it is cruel to beat children, or the theologian who condemns Abraham's intention to sacrifice Isaac, on the ground that murder is always unjustifiable—are all guilty of arguing *a dicto simpliciter ad dictum secundum quid.* The whole class of narrow-minded people who get some idea or principle into their heads and apply it, irrespective of circumstances, are all sophists, though they know it not.

3. Not less universal is the kind of Fallacy which goes by the name of *Ignoratio Elenchi*, or setting aside the question to be proved for some other like it, but nevertheless different from it. It may be translated by *evading the question*, or more literally, *ignoring the disproof*, since elenchus (ἔλεγχος) is an argument which is used to confute or disprove the arguments of an opponent. He therefore who, instead of disproving his opponent's statement, disproves something which merely resembles it, ignores the real point at issue, and does not refute his opponent in reality, though he may seem to do so. The skilful barrister will often seek to draw off the attention of the jury from the real point at issue, viz., the guilt or innocence of the prisoner, by a pathetic description of the havoc that will be wrought in his home if he is convicted, or by seeking to create an unfair prejudice against prose-

cutor or witnesses. The host who seeks to enhance his guests' appreciation of his wine by letting him know what it cost him, really ignores the point at issue, which is, not whether the wine is expensive, but whether it is good. His argument is valid only so far as price and excellence go hand in hand. The Protestant who seeks to discredit the Catholic religion by adducing the immoral life of some mediæval priest or bishop, or even Pope, equally argues beside the point, which is, whether the Catholic religion is true, not whether there are not men whose unholy lives disgrace the holy religion they profess.

St. Thomas remarks in the Opusculum on the Fallacies,[1] which bears his name, that every fallacy may be reduced to this as to a general principle, and gives as his reason that in every fallacy there is a deficiency of one of the elements necessary to elenchus or disproof of the opposite. In every fallacy either the reasoning itself is bad, or if it is good, it fails to meet the arguments of the opponent. Whichever is the case, there is a failure in what is necessary to disproof, there is an evading of the question, there is an ignoring of the point at issue.

So far as this fallacy has a special character of its own, it consists in the veiled attempt to set aside the assertions of an opponent by a counter-statement which does not really contradict it. It is a fallacy, moreover, which has this peculiarity, that it some-

[1] Opusc. 35. (Ed. Rom. 79).

times serves the purposes of truth, by affording one who is stronger in the truth of his position than in the argument by which he can support it, an opportunity to turn the laugh against a sceptical opponent by some telling retort or personal accusation. A man accuses me of superstition because I believe in modern miracles, and instead of attempting to argue in favour of my convictions I turn round to him and say: "*You* talk of superstition! Why you refused only yesterday to sit down to table because there were thirteen in company!" This may turn the laugh against him, but it is no real argument, it is at most a refusal to discuss the question with him. A story is told of O'Connell that on one occasion when he had to defend a man who was clearly in the wrong, the counsel for the prosecution was a certain Mr. Keefe, who had come in for some money in rather a questionable way, and had taken the name of O'Keefe. O'Connell commenced his defence by addressing his opponent:

> Mr. Keefe O'Keefe
> I see by your brief o'brief
> That you are a thief o'thief,

which so disconcerted Mr. O'Keefe and so tickled the jury that a verdict was returned for the defendant.

These two last examples come under the first of three subdivisions of this fallacy which are so common in every-day life that we cannot pass them unnoticed.

(1) *Argumentum ad hominem*, or appeal to the

individual; when we do not defend our position in itself, but merely show that our opponent is not the man to attack it. This is a perfectly legitimate argument on many occasions. If a man of notoriously immoral life puts himself forward as the champion of morality, or if a man is zealous in some cause which brings him in a large income, or strongly denounces a measure which, though good in itself, will act to his personal disadvantage, we have a right to urge the suspicious circumstance against his right to speak on the subject. When Dr. Newman answered the calumnies of the apostate Achilli against the Church by enumerating a few of his crimes, he was doing a service to truth as well as to religion. If a home manufacturer argues warmly for protective duties, it is quite fair to answer him by reminding him that he is an interested party. If a publican opposes Local Option, we are justified in replying that his arguments lose their weight from the fact of his fearing for his license.

But if we seek to divert the minds of our hearers from the force of a solid argument by an irrelevant attack on the character of the man using it, we incur the charge of offending at once against Logic and against common fairness. If a preacher denounces self-love, and shows how it is opposed to the spirit of Christianity, it is no answer to him to remind him that he often manifests this defect in his own conduct. All that it justifies the listener in answering to him, is that the denunciation of self-love loses a great deal of its force in coming

from the lips of one who is chargeable with it, but it does not justify the rejection of the arguments he employs. "Physician, heal thyself," is a telling response to one who is unable to cure in himself the disease he professes to heal in others. But if the remedies he proposes are in themselves efficacious, and fail in his case only because he will not fulfil the necessary conditions under which alone they will act, then we have no right to reject his remedies on account of his unwillingness to avail himself of them.

(2) *Argumentum ad populum*, or appeal to the people, when an orator or demagogue, instead of employing solid argument, appeals to the passions or prejudices of the mob. "Are you, freeborn citizens, going to allow your liberties to be trampled upon by the minions of the oppressor? Are you going to permit those who have robbed you of the land that is your own, to go on to rob you of the very bread that is to feed your poor hungry children? Are you going to put up with the selfish exactions of the rich, who, not content with all their own unjustly-gotten gains, want to rob you of the little that still remains to you?" All this is ignoring the point at issue, and an appeal to the unenlightened ignorance and prejudices of the people. The No-Popery cry of 1851 was an *argumentum ad populum*, and so is the talk about Englishmen not submitting to the yoke of a foreign despot, and other similar fallacies of pious orators who denounce the Pope.

(3) *Argumentum ad verecundiam*, an appeal to a

man's sense of shame or natural modesty in estimating his own powers. A man ventures to differ from the Theory of Evolution, and he is accused of impertinence and presumption in setting up his own opinion against that of a man of genius like Darwin, who had devoted his life to the study of it. In the Convocation of Oxford it was once proposed to set aside the recommendation of a committee of the Hebdomadal Council on some University question. One of the members of the committee indignantly protested against the rejection of a measure to which he and other learned seniors had devoted a considerable portion of time, and seemed to think this a decisive argument for accepting it. A man intends to become a Catholic. Before doing so, he has an interview with a Protestant clergyman. "In your presumptuous ignorance, you are proposing to forsake the Church of your Baptism, you find fault with the teaching that satisfied the saintly Keble and the learned Pusey, and thousands of holy men besides. Who are you, that in your pride you should think you know better than they?"

The reader will have no difficulty in thinking out for himself plenty of similar arguments that we meet with almost every day. It is not always easy to distinguish between a legitimate use of these three forms of *ignoratio elenchi* and an erroneous one. As a rule, it is better to avoid them, unless we feel very sure that we are treading on the solid ground of truth.

4. The Argument *a non causa pro causa* is under

its various forms one of the most universal of the fallacies. How common to assign effects to an imaginary cause! Every rash judgment is an instance of it. Heli judging the emotion of the mother of Samuel to be due to too much wine, argued *a non causa pro causa.* All superstition is fond of employing it. I walk under a ladder and lose the train just afterwards. Foolishly I attribute my misfortune, not to my unpunctuality, but to the ill-luck resulting from going under a ladder. A ship sails on a Friday and is shipwrecked, and one of the passengers blames his folly in starting on an unlucky day. An habitual drunkard accounts for his shattered nerves to the fact that he studied hard for the army in his youth. A preacher obtains a great success, and attributes the number of conversions to the eloquence wherewith he has preached the word of God, whereas all the while what obtained from God the grace that moved the hearts of men was the prayers and sufferings of some good old dame saying her beads in a corner of the church. As it is one of the marks of genius to discern the underlying causes of events,

> Felix qui potuit rerum cognoscere causas,

so it is one of the marks of a weak and narrow intellect to seize without reflection on some imaginary cause and cling to it even though the evidence is all the other way.

Under this fallacy come others resembling it. *A non vera pro vera*, where we assume as true some-

thing which we think admirably suited to explain a fact, though it is a pure fiction of our own. Many an uncharitable word hinted rather than spoken is a fallacy of a *non vera pro vera*, as well as an offence against the moral law. Some one is asked, Why did A give up his partnership in the firm of A, B, C, and Co., and by some significant gesture implies, though he does not actually assert, that A's money transactions were not creditable. Such a reply is a fallacy, as well as a sin against justice. All false suspicions and unkind judgments come under this fallacy, as well as positive mistakes owing to inadvertence or to ignorance.

*A non tali pro tali* is but a variation of the *a non vera pro vera*. It arises from a mistaken idea respecting the nature of some person or thing. We argue that the book we have just published is sure to succeed because of the ability with which it is written The old-fashioned thorough-going Protestant hates the Catholic Church simply because he imagines it to be utterly different from (nay, the very opposite of) what it really is.

5. The Fallacy of *consequent* occurs in hypothetical syllogisms, where the antecedent and consequent are confused together, and we overlook the difference between the condition and that which follows from it. For instance, I have learned by experience the truth of the proposition: If I drink too much champagne I shall have a headache when I wake. One morning I wake with a headache; if I infer that the headache from which I am suffering results from my indulgence in "Veuve Cliquot"

or Perrier and Jouet's best over night, I am guilty of this fallacy; my inference may be true, but it is not justified by my premiss. I have inverted the consequent and the antecedent, and argued as if consequent were antecedent and antecedent consequent.

This fallacy is one we very frequently encounter. "If the wind changes, it will rain," may be a true proposition, but from the descending showers we cannot argue that the wind has changed. "If you do not take my advice you will not succeed in your enterprise," is a warning often uttered by those who love to give advice to others. The failure comes, and the adviser at once lays it down to the neglect of his wise counsel, even though a thousand other causes may have produced it. "I told you so," is the irritating and fallacious remark with which he meets his poor disappointed friend, forgetting that the failure, though following on the neglect of his advice, is not necessarily a consequence of it.

This fallacy is in many cases only a veiled form of the formal fallacy of faulty inference. The difference, however, lies in this, that here the error results, not from the fact of the inference being unjustifiable, but from the confusion existing in the mind of the reasoner between antecedent or consequent in the major premiss. He simply identifies the two propositions which are united together, instead of regarding the consequent merely as dependent on the antecedent.

**6.** The fallacy of *Petitio principii*, or Begging the

Question, consists in assuming our conclusion in some way or other in our premisses. *Petitio principii*, is a not very exact translation of the name given to this fallacy by Aristotle (τὸ ἐξ ἀρχῆς αἰτεῖσθαι), or the assumption of the question originally proposed for proof; but practically the meaning of the two phrases is identical.

We *beg the question* whenever we veil the proposition we profess to prove, under other words which are more likely to be acceptable to our interlocutor, or which throw dust in his eyes by reason of his not being able to understand them. If I account for morphia producing sleep by saying that it is endowed with a certain soporific virtue, or for headache caused by too much wine by saying that the patient is suffering from alcoholic cephalalgia, or for his having been suffocated, by saying there has been an interruption of the respiratory movements, culminating in acute asphyxia and apnœa, I am not really proving anything, but only saying the same thing in different words. This is, however, rather a repetition of the same proposition than an argument properly so-called.

But where the propositions are not really identical, but dependent one on the other, we have a more real and true *Petitio Principii*. If, for instance, I first assume the Infallibility of the Church, and from its infallible definitions prove the inspiration of the Bible, and afterwards, when asked how I know the Church to be infallible, argue that it is so from the Bible as the inspired word of God, and therefore decisive of the question. I am obviously guilty of

this fallacy.[1] If I attempt to prove the truth of my religious tenets from the fact that I find them very comforting to my soul, and at the latter stage of the argument account for their comforting properties from the fact of their being a part of the revelation of Almighty God, I am clearly arguing in a circle, and begging the question at issue.

The skilful sophist will ingeniously slip his conclusion unawares into one of his premisses in which he thinks it will not be detected. For instance, I am arguing in favour of protective duties on corn in an over-crowded country. I point out the hardships to the farmer that result from foreign competition and the injury that is done to the agricultural labourer. I bring forward instances of trades that have flourished when they were protected, and have declined and disappeared when cheaper goods could be imported from elsewhere. I urge that the advantage resulting to the foreign grower should not be weighed against the misery caused at home, and I appeal eloquently to the patriotism of my audience not to declare themselves in favour of free trade when it is so injurious to the country where it prevails. But in this appeal I am assuming the very point to be proved, which is that a tax on corn is beneficial to the inhabitants of the country im-

[1] It is scarcely necessary to inform the reader that nothing but gross ignorance can excuse those who accuse Catholics of this sort of fallacy. The real process of the argument respecting inspiration is this. We first prove by reason from the Bible received as an ordinary historical record, that our Lord pronounced words which confer Infallibility on the Church. The inspiration of Scripture is subsequently proved from the decrees of the Infallible Church.

posing it; under the veil of my patriotism I most unjustifiably beg the whole question.

Or I am advocating compulsory secular education. I draw a picture of the debasing effects of ignorance, of the increased intelligence and moral superiority of those who have been trained in letters over those left in ignorance; and I protest against the narrow bigotry that allows benefit done to the poor children to be frustrated by religious prejudice. In doing this I am assuming the very point to be proved, that compulsory education without God is more beneficial than voluntary education joined to a love and fear of Him.

7. The last on our list of Fallacies is called *Fallacia Plurium Interrogationum*, where several questions are asked as if they were one or could all be answered together, or when one question is asked which involves a previous assumption which may or may not be true. I demand, for instance, a Categorical answer Yes or No to the question: Were not St. Paul, Socrates, Savonarola, Martin Luther, noble and devoted men? or I ask a man when he left off drinking to excess? The child who was asked whether it loved its father or mother best, judiciously recognized the latent fallacy when it answered: I love *both* best. This fallacy often takes the form of demanding the reason for something that is not really the case. "How can Jesuits defend their maxim that you may do evil that good may come of it?" is a question which assumes as granted what is simply false. This fallacy of Questions is a common resource of all who attack

the cause of Truth. How do you account for the contradiction between the infallible utterances of earlier and later Popes? is one of those insidious questions which contains a lie impossible to refute by reason of its dishonest vagueness. How is it that the Church is always in the wrong in her contests with men of science? How is it that she suppresses the spirit of research and honest inquiry? Such foolish assumptions of what is false as true are of every-day occurrence; in fact the prejudice existing among Protestants is in great measure due to the dark hints thrown out by those who seek to discredit Catholicity, and do not venture to do so by open statement.

Before we quit the subject of Fallacies, we must remind the reader that it is impossible to draw a hard and fast line between their various divisions. Various attempts have been made to classify them in modern times. We have preferred to follow in the steps of Aristotle and St. Thomas, rather than to adopt the improvements, or the fancied improvements, that have been introduced with liberal hand by all who have set themselves to the task of recasting the Logic of their more distinguished predecessors.

## CHAPTER X.

### ON METHOD AND ITS LAWS.

**Importance of Method—Synthetic and Analytic Methods—Method of various Sciences—Laws of Method—Its primary axiom—Certitude of various Methods—St. Thomas on Certitude—Practical Rules of Method—A necessary Caution—Importance of Distinctions—Method and the end to be attained by it.**

WE have now considered reasoning as an advance from certain given premisses to a conclusion, and have examined the form or shape into which it must be thrown, in order to ensure correctness in the process. We have also touched briefly on the character of the premisses from which we start, and have said that they are the *matter* of our arguments, the material on which we have to work by means of the reasoning process. But matter and form may both be excellent: our premisses correct and the conclusion rightly deduced from them, without our being able thereby to do very much towards the attainment of Truth, unless we can make sure of choosing the right method to be pursued. A man might have an excellent pair of horses and drive them in the most approved form, but he would not do much towards the attainment of the end of his journey, if he chose a road over

the blue waters of ocean, or even over the soft sands of the desert. His method of proceeding would be faulty, and this would stop his advance.

Method is therefore a very important consideration, and we mean by Method, *a system of right procedure for the attainment of Truth.*

Method in general may be divided into *synthetic* and *analytic*. Synthetic Method is that which starts from the simple and proceeds to the compound, starts from the universal and proceeds to the particular. It is the method of *composition* (σύνθεσις), inasmuch as it puts together (συνθεῖναι, *componere*) the simple elements which form the complex or composite whole. Thus Geometry is synthetic inasmuch as it begins from axioms, postulates, and definitions, and from them builds up the most intricate and complex problems and theorems. The method of Logic is synthetic inasmuch as it starts from ideas or concepts, unites ideas together in a judgment, or judgments into a syllogism. Ethics is synthetic in method, inasmuch as it starts from the simple data of the moral law, and advances from them to frame more elaborate rules of conduct and laws of human action.

Analytic Method, on the other hand, starts from the complex and thence proceeds to the simple, from the particular and proceeds to the universal. It is the mode of analysis or resolution (ἀνάλυσις), inasmuch as it resolves (ἀναλύειν, *resolvere*) the composite whole into its component elements. When a theorem is proposed to the geometrician for solution, and he separates off the various portions

of the figure, assigning to each its own laws, and thus arriving at a proof of the proposition laid before him, he pursues a method of analysis. When the logician argues from the individuals to the whole of the class composed of them, he is proceeding from a greater to a less complexity, and is pursuing the analytic method. When a theologian has placed before him some difficult case of conscience, and discerns the principles which are to be his guide in arriving at a solution of it, his method is clearly one of analysis. All sciences are partly analytic and partly synthetic in their method. The analytical chemist pursues the method of analysis when he has submitted to him the stagnant water or adulterated food, and gives in detail the various ingredients of which it is composed. On the other hand he pursues the synthetic method when the prescription is made up for the sick man, or some delicate perfume composed of elements perhaps not very attractive in detail.

But there are some sciences which are primarily synthetic in their method, and use analysis only as subsidiary to their primary and natural system of proceeding. Others, again, are primarily analytic, and for them synthesis is subsidiary. The method of Logic, Geometry, Ethics, is primarily synthetic, that of Chemistry or Botany, primarily analytic. How are we to account for this difference?

We have here to fall back on a distinction we have more than once laid stress upon in the course of our investigation. Some sciences are *a priori* or *deductive* sciences, inasmuch as they start from

principles which are based on the inner nature of things and on the laws of reason. These principles are discernible underlying the concrete case as soon as it is presented to us. Such sciences are Logic, Ethics, Algebra, Politics, Geometry.

Other sciences are *a posteriori* or *inductive* sciences, inasmuch as they start from principles which are learned from observation and experiment and from a study of the external world, and are based, not on the inner nature of things or on the laws of reason, but on the laws of external nature. These laws cannot be at once discerned, but can only be arrived at gradually and by questioning nature and searching into the material universe around us. Such sciences are Acoustics, Optics, Hydrostatics, Mechanics, Chemistry, Botany, &c.

Other sciences, again, are *mixed*, in that they depend partly on *a priori* principles, partly on *a posteriori* laws. In these it is necessary to employ in due proportions the data of some *a priori* science, and the laws that are learned by experiment and observation. Such a science is Astronomy, which is based partly on geometrical principles, partly on physical laws. Such a science again is Political Economy, which depends partly on the moral law partly on the physical conditions of individual countries. Each science is primarily synthetic or analytic in method according as it is chiefly deductive or inductive in its character, according as its laws are for the most part *a priori* or *a posteriori* laws.

But as we shall see, the Laws of Method admit of

certain variations according to the end which is proposed to be attained. The rule we have laid down has reference to the *Method* which belongs to this or that science, apart from the special end in view.

### ON THE LAWS OF METHOD.

Method is governed by certain fixed laws which furnish us with the principles on which we are to act in selecting our mode of procedure, and also by certain practical rules which must be carefully observed if we hope for success in our investigations.

1. We must always begin from that which is near at hand, and thence make our way to that which is remote, from that with which we are familiar, and thence proceed to that with which we are unfamiliar, from that which is more easy, and thence attain to that which is more difficult. What is more at hand and familiar will not be the same to one who is arguing synthetically and to another who is pursuing the analytic method; nay, what is most familiar to one will be most unfamiliar to the other. The former starts from axioms and first principles; these are his stock in trade, and the first step in his apprenticeship is to make himself completely familiar with them. The latter starts from concrete facts and individual instances; it is with these that he is furnished, and from these he has to mount up to the universal. By this we are able at once to discern a Deductive from an Inductive Science, and the progress from the Inductive to the Deductive stage is marked by an ever-increasing possession of the principles which determine the character of indi-

vidual things, and by the diminution of the necessity of watching effects and judging from results, and from them ascending to axioms, principles, maxims, laws.

This law seems to be too obvious to be worth stating, but it is one that in practice is often sadly neglected. The student who, with a foolish ambition, aims at that which is beyond his reach; the teacher who thrusts into his unhappy pupils laws and principles without any attempt to render them intelligible by concrete instances; the metaphysician who assumes as innate, principles to which we can only rise from the data of sense interpreted by reason, all transgress this primary and simple law.

Here we must recall the distinction we drew between things *in themselves* more simple and better known, and things more simple *to us*, better known *to us*. To the child the proposition that two and two make four is simpler than the primary Law of Identity on which it is based; to ordinary men the coming change of weather is better known from a gathering together of a hundred familiar signs, than from the application of a few elementary laws. The simplicity which we require in method must be the simplicity which is relative to the individual. What avails it to us that an idea or a proposition should be more simple *in itself*, if it is not more simple *to us?*

2. All method to be sound must be gradual. The great rule for attaining true knowledge is *pedetentim procedere*. Slow and sure must be our motto. It is true that genius will sometimes by a brilliant guess

or an instinctive appreciation of truth overleap the steps that are necessary to ordinary men. But even a man of genius will, if he is wise, test and try, it may be for long years, his wide hypothesis, before he ventures to stamp it with the honoured name of law. Besides, legislation is for ordinary mortals, not for men of genius, and for them to hurry to a conclusion is an unfailing course of error.

3. The same certainty cannot be attained in all the sciences. This is Aristotle's sage remark at the beginning of the *Ethics*. We must expect only that degree of certitude which our subject-matter admits of. You might as well, he says, expect persuasive oratory from a mathematician as demonstration from an orator. He might have added that you might as well expect a mathematician to illustrate metaphysics by a series of tableaux vivants, as expect a teacher of physical science, or one who pursues its method of argument, to attain to the certitude of the metaphysician. We need not repeat here what we have already said under the head of certitude, and in speaking of the inductive methods. It is enough to quote a few words from St. Thomas.[1] Speaking of two contrary rules which lead men to be sceptical and to doubt, "There are some," he says, "who will not receive anything that is told them unless it is mathematically proved. This is common with those who have had a mathematical training, because custom is second nature. Others there are who will not receive anything unless there is put before them some instance of it that their senses

[1] Lect. 5, in *Metaph.* 2.

can perceive. This results either from habit, or from the predominance in them of the influence of their senses, and a want of intellectual power. Others, however, there are who desire that everything stated to them should be based on certitude, that it should be founded on a diligent and rational inquiry. This is the result of the exercise of a sound understanding in judging and reason in inquiry, supposing always that it is not sought in matters where it cannot exist."

This golden advice has a practical value for every intellect that inquires. The fatal habit of accepting unproved conclusions and treating them as if they were mathematically established, is a vice no less common than that of an obstinate refusal to accept unpalatable results for which there exists evidence enough and to spare. To start some magnificent hypothesis is always a strong temptation to men of intellectual ambition, and to receive on authority general principles the proof of which they cannot follow step by step, is a serious, and too often fatal trial to their intellectual humility.

We must add to these laws a number of practical rules applicable to all scientific investigation, whether it proceed from universals to particulars, or from particulars to universals.

(1) Never employ any term unless it be understood. There is no need to repeat what we have already said in speaking of definition. Indistinctness of perception, vague and ill-defined ideas, an inaccurate confusion of things really different, an

assignment of imaginary differences to things really the same, all go hand in hand with the neglect of a careful definition of terms used. Most of the common objections to the worship of our Lady, to the doctrines of the Immaculate Conception, of Transubstantiation, and of Indulgences; to the Infallibility of the Roman Pontiff, to the system of Casuistry, to the doctrine of Intention, &c., are due to either inexact or erroneous notions respecting the meaning of the terms employed.

(2) Distinguish clearly between the essential and accidental elements in the matter discussed. The law of *Association*, which is liable to a very perilous abuse, and unless carefully watched is a constant source of error, exhibits to us, in union with one another, things the union of which is but accidental. The invariable antecedent is mistaken for the cause; the phenomenon which, as far as our own observation goes, has never been separated from some other phenomenon, is regarded as inseparably united with it. An Englishman resident in some city of South America sees united in the inhabitants a profession of the Catholic religion, a great laxity of morals, and an absence of all energy, fortitude, or perseverance. Neglecting our rule, he comes to the conclusion that there is a necessary connection between Catholicism and the vices around him. Or to take a very different example, a man given to field sports observes that a day's shooting is invariably followed by a headache on the following morning. When experience has taught him that the two invariably go together, he begins to connect the

exercise taken on the previous day with the headache from which he is suffering, but fails to observe that the day's shooting induces an exhaustion at dinner-time, which he seeks to remedy by several extra glasses of bottled stout or port wine. He mistakes the accidental for the essential, the antecedent for the cause, till one day, when he observes his usual moderation, he finds to his surprise that he may walk all day over a heavy country under a burning sun, without any inconvenience following thereupon, as long as he keeps to his pint of stout and two glasses of wine. Or again, we may have observed in the newspapers that a larger number of persons lose their lives by drowning on a Sunday than on any other day. On this fact the Scotch Presbyterian makes the remark that it can only be explained by the anger of God with all who take their pleasure on His holy day; quite overlooking the circumstance that it is on Sunday that a great number of excursionists of the middle and lower classes, who are unskilled in the use of boats and rarely can swim, take their pleasure on the water.

(3) We must very carefully separate off the various parts of the question to be discussed one from the other, and follow them up in detail until we have mastered the several parts of which the whole is composed. It is only by this means that we are able to separate the accidental from the essential, and thus to clear our ground. If, for instance, a man who was investigating the truth of Christianity were considering the cause of the vice in some South American State, he would

take in detail the evils that exist, and the circumstances that seem to foster them. He would examine the condition of neighbouring countries whose circumstances very much resemble those of the State under discussion in everything save religion, and having thus isolated one element in the question, would see what was the result produced by its absence. He would, moreover, examine the moral and social condition of countries differing in most respects from the South American Republic with which we are concerned, but resembling it in their possession of Christianity. But here, as our readers will have observed, we are recurring to the Methods of Agreement and Difference noticed above, and for the clear exposition of which we are indebted to the labours of Mr. John Stuart Mill.

(4) Lastly, we must remember that it makes a great difference whether we are making investigations for ourselves with a view to the attainment of scientific knowledge, or seeking to communicate to others knowledge already in our possession. In the former case, *Analysis* is the natural method to be pursued, inasmuch as we have before us complex knowledge, and results which are the combined results of a number of causes. After we have broken up our phenomena and formed an hypothesis as to its component parts, we shall have to test this hypothesis by the opposite process of *Synthesis*. We shall have to see whether the causes which are supposed to have produced it have really done so, and with this object we combine them together to see what the result will be. An analytical

chemist has some water sent him from a mineral spring which works such cures that it is generally esteemed to be miraculous. He has been asked whether, so far as he can tell, its health-giving effects can be due to the effect of the combination of certain minerals which are held in solution in it. He accordingly begins by applying certain tests by which he can ascertain the nature and quantity of the various ingredients it contains. After he has satisfied himself on this point, he has recourse to the experience of himself and others with regard to the results produced on the system by these various minerals when administered together in the proportions in which they exist in the spring, and from those two processes, first analysis and then synthesis, he draws his conclusion respecting the question asked of him.

But suppose this same chemist has to lecture on the subject to an intelligent audience: to explain to them why it is possible or impossible (as the case may be) that the spring could produce naturally the effects ascribed to it. Here he reverses the process. He appears on the platform with a series of phials containing the different mineral salts which he has discovered in the spring. He explains to his audience the results of each on the human body, and the probable effect of the whole. He begins with synthesis, in that he combines together the simple elements in his lecture, and exhibits in his description the complex result they would produce together. He then goes on to analyze the various cures, to explain in their separate details the changes wrought

by the wonder-working water, and to express his scientific opinion as to the possibility of this or that effect having been produced by this or that ingredient, working either by itself, or in union with some other ingredient which furthers its effect.

In each of these opposite processes, the rule given above of commencing with what is more familiar, and thence proceeding to what is more remote and unfamiliar, is observed by the chemist. In his investigation he commences with that which is more familiar to ordinary mortals (*nobis notiora*), the water of the spring where thousands have drunk or bathed, and thence proceeds to the various chemical agents it contains which are to us a mystery, though in themselves they may be so simple as to admit of no further analysis. In imparting to others the results of his experiments, he begins from what is simpler in itself and therefore more familiar to nature (*naturæ notiora*), and thence proceeds to the complex results with which ordinary men are familiar, however complex they may in themselves be.

This distinction between discovery and instruction holds good alike in deductive and inductive sciences. The skilled mathematician has submitted to him the equation to some curve. His first step is invariably in the direction of analysis. He gives various values to $x$ and $y$ in the equation, finds out the separate value of each when the other disappears, or when it has this or that positive or negative value, breaks up the equation, if possible, into its factors, seeks by every means in his power to reduce its

complexity to simplicity. Having thus discovered the nature of his curve, he draws it in detail, putting together by synthesis the results of his analysis, and thus constructing the geometrical curve, the equation of which constituted his original data. But if it is a question of imparting knowledge to a learner, of teaching the formula which expresses, in mathematical language, hyperbola, or parabola, or cusp, the whole process is reversed. First of all there is given, in the form of a definition, the simplest notion of the curve or figure in question. This definition, in combination with other algebraic and geometric principles already acquired, enables the learner to perform, under the guidance of his teacher, an elaborate process of synthesis which proceeds step by step from the more simple to the more complex, until at length he arrives at the equation of the curve in question. This done, he tests his knowledge by a subsequent analysis. He gives to the various symbols different values, and so verifies his synthesis, thus ending with a process exactly corresponding to that by which the skilled mathematician commenced.

# APPENDIX.

## ON THE SCHOLASTIC METHOD.

It is a common charge against Scholastic Philosophy that instead of pursuing the safe method of interrogating nature, it assumed certain principles unproved, and employed them as a means of solving all the various questions that presented themselves. The modern Experimental School, who date from Bacon, prides itself on setting aside the *a priori* method for that of a careful and elaborate inquiry into facts with a subsequent generalization based upon the facts examined. It does not fall within our province to give a history of this great change, which has given so strong an impulse to physical discovery and to the advance of the physical sciences. We have already alluded to it elsewhere.[1] But the accusation against the Scholastics cannot be passed over unnoticed, and as it has a certain foundation in fact, it may be well to point out how far there was anything deserving censure in the Scholastic Method.

We have pointed out that the *a posteriori*, or analytic method, is the method of *discovery*, the *a priori*, or synthetic, that of *instruction*. The Schoolmen are

[1] Pp. 82, seqq., 379, seqq.

accused of neglecting to cultivate the former, and of consequently making no progress in the way of enlarging the field of human knowledge, and of devoting themselves entirely to the latter, and of being satisfied with a traditional system of dogmas borrowed one from the other, without any serious attempt to verify them by an appeal to experience. They are accused of starting on philosophical investigation with certain dogmatic prejudices, instead of taking the facts, and by the *a posteriori* method building up, from a careful examination of them, the principles which when once firmly established were for all future time the landmarks to guide the onward march of human knowledge. Instead of setting out on their investigation with a fair field and no favour, with no fixed ideas on the subject of Ethics or Logic or Psychology, they are supposed to have blindly taken for granted that what was taught to them was true, instead of searching the book of nature and their own intelligence to see whether those things were so.

Of the physical sciences it is perfectly true that in mediæval times they did not make any very rapid progress. Since the Reformation, physical science has advanced with giant strides. Material civilization has been developed to an extent that would have been scarcely possible if the Church had not lost her dominion over a large part of modern Europe. Victories have been won over Nature of which the Schoolmen never dreamed, and the spirit of enterprise, unchecked by fear of authority, has fought its way with astonishing success in all the natural arts and sciences.

But is the same true of the sciences that deal not with the material but the immaterial? not with the visible but with the invisible? not with brute matter but with mind, thought, conscience, God? It is on the answer to this question that must depend our approval or disapproval of the Scholastic Method.

No one will, I imagine, deny that the sciences which deal with the invisible and immaterial are of far greater importance than those which are concerned with the visible and the material, that Theology has a greater influence for good or evil than Chemistry, and Psychology than Botany.. If to the *a priori* sciences as they are called, the *a posteriori* method has been successfully applied, the folly of the Schoolmen in neglecting it must be conceded. But if not, if it has proved a failure when once the consideration of the corruptible things around us is exchanged for the study of the incorruptible and eternal, then we shall rejoice in the conservative maintenance of the *a priori* method by Scholastic Philosophers, even though they forfeited thereby the superior acquaintance with Heat and Light, with Physiology and Botany and Chemistry, which is the boast of the present day.

Now in all the mental sciences the acceptance of fixed principles as universally true has become year by year a rarer phenomenon among those who have applied to them the *a posteriori* methods that have been so successfully pursued in the physical sciences. In the latter, the brilliant hypothesis cannot hold the ground unless it is true, and there is a con-

tinually increasing consensus on all physical questions. In the former, the hypothesis, whether brilliant or not, holds its ground in spite of its falsity. There is no means of testing it and detecting its true character if it is an imposture.

The consequence of this is that there is no sort of convergence of opinion on moral and religious questions, but on the contrary an ever increasing divergence. New forms of religion with new dogmas continually appear and are eagerly accepted. On questions of morality the disagreement even on matters that concern the natural law increases day by day. Psychology is in a state of the wildest confusion. All the fundamental Laws of Thought are called in question, and the logician, who is supposed to be the champion of Truth, professes with suicidal scepticism that a proposition may be at the same time true and false, and that contradictories in no way exclude each other from simultaneous acceptance. These are the results of the departure from the *a priori* method of the Schoolmen: judged even by the *a posteriori* method they certainly cannot be regarded as happy. An army fighting within itself is not marching to victory; there is no increasing grasp of Truth where the discordant questioning as to what is Truth is continually increasing.

But is it possible to shake off entirely the *a priori* method and the acceptance of certain principles as true prior to all reasoning? We saw in discussing the philosophy of Mr. Mill[1] that he assumes unconsciously a First Principle which he professes to prove.

[1] Cf. pp. 80—91.

The same *petitio principii* runs through the whole of the Experimental School. The Scottish metaphysicians, on the other hand, by their assertion of the conditional and of the relative character of our concepts, practically declare Truth to be something subjective to the individual, and destroy the reality of Objective Truth at all; while the German Hegelians, carrying out the antinomies of Kant, and declaring that contradictories are true together, shut themselves out of the field entirely: for who can argue with a man who practically asserts that what he says is at the same time true and false, or that the opponent who contradicts him is equally in possession of Truth with himself?

When Aristotle at the begining of his *Ethics* lays down that we must begin from things familiar to us rather than first principles, he does not mean that we are to imitate the method of the moderns and to assume no principles for granted. He is advocating the procedure from the concrete fact to the universal law, inasmuch as the latter is more difficult for ordinary men to grasp in abstract form. The principle, he tells us will, in the case of those who are well-trained in morals, be clear to them as underlying the fact, and for this reason he urges the importance of a careful education for those who are to study moral questions. They will be able at once to grasp the innate principle when its particular application is put before them, just as a man by reason of his mental constitution at once grasps the fact that things equal to the same thing are equal to each other.

This it is which is the true *a posteriori* method of Scholastic Philosophy in what are called the Deductive sciences as opposed to the false method of the moderns. With the former it is the recognition of the universal law under one single instance; with the latter it is the building up of the universal law by an observance of results to be carefully tested by the Experimental methods. On physical questions we are ready to admit that the Schoolmen were far behind, and that they had not thrown their energy into the investigation of the properties of steam and electricity and light and heat and sound. This was because they regarded as the true objects of human interest, questions which are now practically subordinate in the minds of men. Their interests were in the science of sciences, in Theology, the science of God, and in all the other sciences in proportion as they ministered thereto. Hence their method was the method of Theology and of the sciences that were its immediate handmaids, and as all these were Deductive and *a priori* sciences, not Inductive and *a posteriori*, their method was naturally the Deductive and not the Inductive method.

Did this hinder their advance in the acquisition of knowledge? Perhaps so, in what in modern parlance bears the name of Science, but not in Philosophy or Theology, or Pure Mathematics. For in Philosophy all discovery is but an application of *a priori* principles to fresh facts. There are no fresh principles to discover. The laws of the human mind may be elaborated or re-stated, but from the beginning they have been the guides of

human intelligence and from the days of Aristotle they have been familiar to all sound Philosophers. The Aristotelian Logic, the Aristotelian Metaphysics, the Aristotelian Psychology have never been improved upon, allowing for certain necessary modifications introduced by Christianity, as regards the substance of the doctrine taught. If we cannot say the same of the Aristotelian Theology or Ethics, it is partly because Christianity reconstructed even Natural Theology, partly because it opened out indefinitely the field of Theology by the introduction of the Christian Revelation. But for Theology, revealed as well as natural, there was no fresh discovery from the days when the deposit of Revealed Truth was completed. Henceforward progress was by way of development, not of discovery; from within, not from without. When men accuse the Scholastics of inventing no fresh system of Philosophy and contrast them with modern philosophers since the days of Bacon, they are perfectly right. Since the days of St. Thomas there is no fresh foundation of philosophical truth to be laid, no fresh system to invent, save by inventing falsity in the place of Truth. If this is the invention which is recommended, God save us from it!

One philosophy after another rises up in modern days and proclaims itself to be the voice of a teacher sent from God. For a time its prophet gathers round himself a number of enthusiastic disciples, and promises great things to an unenlightened world. But soon a rival appears, and denounces his predecessor as inconsistent with himself and incon-

sistent with Truth, and engages to remedy the evil by fresh discoveries of its own. But alas! the promise is but ill fulfilled; he, too, is slain in his turn by one who follows close upon his heels, and who denounces him with no less vigour than he had himself displayed against his discarded predecessor.

Sometimes, indeed, some bolder spirit, perceiving the inconsistencies of his own system of philosophy, defies criticism by announcing the necessity of antinomies and by asserting that contradictories can be true together. Thus indeed, he escapes his enemies, but it is to fall by his own sword, for what becomes of Truth if a proposition and its contradictory are allowed to be equally in accordance with Truth?

Thus it is that the battle goes on continually outside the Catholic Church, and the internecine warfare is mistaken for a healthy sign of life. The multiformity of error is misnamed the many-sidedness of truth, and even when one hypothesis after another proves to be utterly untenable, men are content to invent yet another, that it too may be rejected in its turn. But within the fold of Truth a system at variance with Truth cannot long flourish. It may for a time gain adherents, advocated if it be by the force of genius and the plausibility of an active intelligence. But it will soon find itself in conflict with Truth, and sooner or later will be condemned by the infallible voice of the Vicar of Him who came to bear witness to the Truth. For within her the perfect Truth dwells, and, dwelling there,

must soon expel the subtlest form of error that the mind of man can devise.

This is why in the philosophy of the Church there can be no new discoveries, but only developments of Truth already possessed. For fresh discovery means a setting aside of what exists already, and if what exists already is the perfect Truth, to set it aside is but to introduce the destructive poison of error.

We cannot, therefore, be surprised if the Method of Discovery did not flourish among the Scholastic philosophers. Nor can it ever be the adopted method of the Catholic Church. She will ever look on, from her throne upon the Rock, and will watch unmoved the discoveries of modern science, knowing that they will contribute sooner or later, one and all, to illustrate the truth of her philosophy. She will watch the rise and fall of one system of philosophy after another, knowing that amid their dismantled ruins she will remain in her unshaken supremacy the true Queen of all Science and the Mistress of all Philosophy. For to her all arts and all sciences minister, but none more than the Art and Science of Logic, since the Catholic Church alone can challenge the world to point out a single inconsistency in her teaching, or a single weak point in the perfect system of Divine philosophy which God through her has given to the world.

THE END.

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