CHAPTER VI

CONDITIONS OF IMMEDIATE INFERENCE

Section 1. The word Inference is used in two different senses, which are often confused but should be carefully distinguished. In the first sense, it means a process of thought or reasoning by which the mind passes from facts or statements presented, to some opinion or expectation. The data may be very vague and slight, prompting no more than a guess or surmise; as when we look up at the sky and form some expectation about the weather, or from the trick of a man's face entertain some prejudice as to his character. Or the data may be important and strongly significant, like the footprint that frightened Crusoe into thinking of cannibals, or as when news of war makes the city expect that Consols will fall. These are examples of the act of inferring, or of inference as a process; and with inference in this sense Logic has nothing to do; it belongs to Psychology to explain how it is that our minds pass from one perception or thought to another thought, and how we come to conjecture, conclude and believe (*cf.* chap. i. Section 6)

In the second sense, 'inference' means not this process of guessing or opining, but the result of it; the surmise, opinion, or belief when formed; in a word, the conclusion: and it is in this sense that Inference is treated of in Logic. The subject-matter of Logic is an inference, judgment or conclusion concerning facts, embodied in a proposition, which is to be examined in relation to the evidence that may be adduced for it, in order to determine whether, or how far, the evidence amounts to proof. Logic is the science of Reasoning in the sense in which 'reasoning' means giving reasons, for it shows what sort of reasons are good. Whilst Psychology explains how the mind goes forward from data to conclusions, Logic takes a conclusion and goes back to the data, inquiring whether those data, together with any other evidence (facts or principles) that can be collected, are of a nature to warrant the conclusion. If we think that the night will be stormy, that John Doe is of an amiable disposition, that water expands in freezing, or that one means to national prosperity is popular education, and wish to know whether we have evidence sufficient to justify us in

holding these opinions, Logic can tell us what form the evidence should assume in order to be conclusive. What *form* the evidence should assume: Logic cannot tell us what kinds of fact are proper evidence in any of these cases; that is a question for the man of special experience in life, or in science, or in business. But whatever facts constitute the evidence, they must, in order to prove the point, admit of being stated in conformity with certain principles or conditions; and of these principles or conditions Logic is the science. It deals, then, not with the subjective process of inferring, but with the objective grounds that justify or discredit the inference.

Section 2. Inferences, in the Logical sense, are divided into two great classes, the Immediate and the Mediate, according to the character of the evidence offered in proof of them. Strictly, to speak of inferences, in the sense of conclusions, as immediate or mediate, is an abuse of language, derived from times before the distinction between inference as process and inference as result was generally felt. No doubt we ought rather to speak of Immediate and Mediate Evidence; but it is of little use to attempt to alter the traditional expressions of the science.

An Immediate Inference, then, is one that depends for its proof upon only one other proposition, which has the same, or more extensive, terms (or matter). Thus that *one means to national prosperity is popular education* is an immediate inference, if the evidence for it is no more than the admission that *popular education is a means to national prosperity:* Similarly, it is an immediate inference that *Some authors are vain*, if it be granted that *All authors are vain.*

An Immediate Inference may seem to be little else than a verbal transformation; some Logicians dispute its claims to be called an inference at all, on the ground that it is identical with the pretended evidence. If we attend to the meaning, say they, an immediate inference does not really express any new judgment; the fact expressed by it is either the same as its evidence, or is even less significant. If from *No men are gods* we prove that *No gods are men*, this is nugatory; if we prove from it that *Some men are not gods*, this is to emasculate the sense, to waste valuable information, to lose the commanding sweep of our universal

proposition.

Still, in Logic, it is often found that an immediate inference expresses our knowledge in a more convenient form than that of the evidentiary proposition, as will appear in the chapter on Syllogisms and elsewhere. And by transforming an universal into a particular proposition, as *No men are gods*, therefore, *Some men are not gods*,—we get a statement which, though weaker, is far more easily proved; since a single instance suffices. Moreover, by drawing all possible immediate inferences from a given proposition, we see it in all its aspects, and learn all that is implied in it.

A Mediate Inference, on the other hand, depends for its evidence upon a plurality of other propositions (two or more) which are connected together on logical principles. If we argue—

No men are gods;
Alexander the Great is a man;
Therefore Alexander the Great is not a god:

this is a Mediate Inference. The evidence consists of two propositions connected by the term 'man,' which is common to both (a Middle Term), mediating between 'gods' and 'Alexander.' Mediate Inferences comprise Syllogisms with their developments, and Inductions; and to discuss them further at present would be to anticipate future chapters. We must now deal with the principles or conditions on which Immediate Inferences are valid: commonly called the "Laws of Thought."

Section 3. The Laws of Thought are conditions of the logical statement and criticism of all sorts of evidence; but as to Immediate Inference, they may be regarded as the only conditions it need satisfy. They are often expressed thus: (1) The principle of Identity—'*Whatever is, is*'; (2) The principle of Contradiction—'*It is impossible for the same thing to be and not be*'; (3) The principle of Excluded Middle—'*Anything must either be or not be*.' These principles are manifestly not 'laws' of thought in the sense in which 'law' is used in Psychology; they do not profess to describe the actual mental processes that take place in judgment or reasoning, as the 'laws of association of ideas' account for memory and

recollection. They are not natural laws of thought; but, in relation to thought, can only be regarded as laws when stated as precepts, the observance of which (consciously or not) is necessary to clear and consistent thinking: *e.g.*, Never assume that the same thing can both be and not be.

However, treating Logic as the science of thought only as embodied in propositions, in respect of which evidence is to be adduced, or which are to be used as evidence of other propositions, the above laws or principles must be restated as the conditions of consistent argument in such terms as to be directly applicable to propositions. It was shown in the chapter on the connotation of terms, that terms are assumed by Logicians to be capable of definite meaning, and of being used univocally in the same context; if, or in so far as, this is not the case, we cannot understand one another's reasons nor even pursue in solitary meditation any coherent train of argument. We saw, too, that the meanings of terms were related to one another: some being full correlatives; others partially inclusive one of another, as species of genus; others mutually incompatible, as contraries; or alternatively predicable, as contradictories. We now assume that propositions are capable of definite meaning according to the meaning of their component terms and of the relation between them; that the meaning, the fact asserted or denied, is what we are really concerned to prove or disprove; that a mere change in the words that constitute our terms, or of construction, does not affect the truth of a proposition as long as the meaning is not altered, or (rather) as long as no fresh meaning is introduced; and that if the meaning of any proposition is true, any other proposition that denies it is false. This postulate is plainly necessary to consistency of statement and discourse; and consistency is necessary, if our thought or speech is to correspond with the unity and coherence of Nature and experience; and the Laws of Thought or Conditions of Immediate Inference are an analysis of this postulate.

Section 4. The principle of Identity is usually written symbolically thus: *A is A; not-A is not-A*. It assumes that there is something that may be represented by a term; and it requires that, in any discussion, *every relevant term, once used in a definite sense, shall keep that meaning throughout*. Socrates in his father's workshop, at the battle of Delium, and in prison, is assumed to be

the same man denotable by the same name; and similarly, 'elephant,' or 'justice,' or 'fairy,' in the same context, is to be understood of the same thing under the same *suppositio*.

But, further, it is assumed that of a given term another term may be predicated again and again in the same sense under the same conditions; that is, we may speak of the identity of meaning in a proposition as well as in a term.

To symbolise this we ought to alter the usual formula for Identity and write it thus: *If B is A, B is A; if B is not-A, B is not-A*. If Socrates is wise, he is wise; if fairies frequent the moonlight, they do; if Justice is not of this world, it is not. *Whatever affirmation or denial we make concerning any subject, we are bound to adhere to it for the purposes of the current argument or investigation*. Of course, if our assertion turns out to be false, we must not adhere to it; but then we must repudiate all that we formerly deduced from it.

Again, *whatever is true or false in one form of words is true or false in any other*: this is undeniable, for the important thing is identity of meaning; but in Formal Logic it is not very convenient. If Socrates is wise, is it an identity to say 'Therefore the master of Plato is wise'; or, further that he 'takes enlightened views of life'? If *Every man is fallible*, is it an identical proposition that *Every man is liable to error*? It seems pedantic to demand a separate proposition that *Fallible is liable to error*. But, on the other hand, the insidious substitution of one term for another speciously identical, is a chief occasion of fallacy. How if we go on to argue: therefore, *Every man is apt to blunder, prone to confusion of thought, inured to self-contradiction*? Practically, the substitution of identities must be left to candour and good-sense; and may they increase among us. Formal Logic is, no doubt, safest with symbols; should, perhaps, content itself with A and B; or, at least, hardly venture beyond Y and Z.

Section 5. The principle of Contradiction is usually written symbolically, thus: *A is not not-A*. But, since this formula seems to be adapted to a single term, whereas we want one that is applicable to propositions, it may be better to write it thus: *B is not both A and not-A*. That is to say: *if any term may be affirmed of a subject, the*

contradictory term may, in the same relation, be denied of it. A leaf that is green on one side of it may be not-green on the other; but it is not both green and not-green on the same surface, at the same time, and in the same light. If a stick is straight, it is false that it is at the same time not-straight: having granted that two angles are equal, we must deny that they are unequal.

But is it necessarily false that the stick is 'crooked'; must we deny that either angle is 'greater or less' than the other? How far is it permissible to substitute any other term for the formal contradictory? Clearly, the principle of Contradiction takes for granted the principle of Identity, and is subject to the same difficulties in its practical application. As a matter of fact and common sense, if we affirm any term of a Subject, we are bound to deny of that Subject, in the same relation, not only the contradictory but all synonyms for this, and also all contraries and opposites; which, of course, are included in the contradictory. But who shall determine what these are? Without an authoritative Logical Dictionary to refer to, where all contradictories, synonyms, and contraries may be found on record, Formal Logic will hardly sanction the free play of common sense.

The principle of Excluded Middle may be written: *B is either A or not-A*; that is, *if any term be denied of a subject, the contradictory term may, in the same relation, be affirmed*. Of course, we may deny that a leaf is green on one side without being bound to affirm that it is not-green on the other. But in the same relation a leaf is either green or not-green; at the same time, a stick is either bent or not-bent. If we deny that A is greater than B, we must affirm that it is not-greater than B.

Whilst, then, the principle of Contradiction (that 'of contradictory predicates, one being affirmed, the other is denied ') might seem to leave open a third or middle course, the denying of both contradictories, the principle of Excluded Middle derives its name from the excluding of this middle course, by declaring that the one or the other must be affirmed. Hence the principle of Excluded Middle does not hold good of mere contrary terms. If we deny that a leaf is green, we are not bound to affirm it to be yellow; for it may be red; and then we may deny both contraries, yellow and green. In fact, two contraries do not between them cover the

whole predicable area, but contradictories do: the form of their expression is such that (within the *suppositio*) each includes all that the other excludes; so that the subject (if brought within the *suppositio*) must fall under the one or the other. It may seem absurd to say that Mont Blanc is either wise or not-wise; but how comes any mind so ill-organised as to introduce Mont Blanc into this strange company? Being there, however, the principle is inexorable: Mont Blanc is not-wise.

In fact, the principles of Contradiction and Excluded Middle are inseparable; they are implicit in all distinct experience, and may be regarded as indicating the two aspects of Negation. The principle of Contradiction says: *B is not both A and not-A*, as if *not-A* might be nothing at all; this is abstract negation. But the principle of Excluded Middle says: *Granting that B is not A, it is still something*—namely, *not-A*; thus bringing us back to the concrete experience of a continuum in which the absence of one thing implies the presence of something else. Symbolically: to deny that B is A is to affirm that B is not A, and this only differs by a hyphen from B is not-A.

These principles, which were necessarily to some extent anticipated in chap. iv. Section 7, the next chapter will further illustrate.

Section 6. But first we must draw attention to a maxim (also already mentioned), which is strictly applicable to Immediate Inferences, though (as we shall see) in other kinds of proof it may be only a formal condition: this is the general caution *not to go beyond the evidence*. An immediate inference ought to contain nothing that is not contained (or formally implied) in the proposition by which it is proved. With respect to quantity in denotation, this caution is embodied in the rule 'not to distribute any term that is not given distributed.' Thus, if there is a predication concerning 'Some S,' or 'Some men,' as in the forms I. and O., we cannot infer anything concerning 'All S.' or 'All men'; and, as we have seen, if a term is given us preindesignate, we are generally to take it as of particular quantity. Similarly, in the case of affirmative propositions, we saw that this rule requires us to assume that their predicates are undistributed.

As to the grounds of this maxim, not to go beyond the evidence, not to distribute a term that is given as undistributed, it is one of the things so plain that to try to justify is only to obscure them. Still, we must here state explicitly what Formal Logic assumes to be contained or implied in the evidence afforded by any proposition, such as 'All S is P.' If we remember that in chap. iv. Section 7, it was assumed that every term may have a contradictory; and if we bear in mind the principles of Contradiction and Excluded Middle, it will appear that such a proposition as 'All S is P' tells us something not only about the relations of 'S' and 'P,' but also of their relations to 'not-S' and 'not-P'; as, for example, that 'S is not not-P,' and that 'not-P is not-S.' It will be shown in the next chapter how Logicians have developed these implications in series of Immediate Inferences.

If it be asked whether it is true that every term, itself significant, has a significant contradictory, and not merely a formal contradictory, generated by force of the word 'not,' it is difficult to give any better answer than was indicated in Sections 3-5, without venturing further into Metaphysics. I shall merely say, therefore, that, granting that some such term as 'Universe' or 'Being' may have no significant contradictory, if it stand for 'whatever can be perceived or thought of'; yet every term that stands for less than 'Universe' or 'Being' has, of course, a contradictory which denotes the rest of the universe. And since every argument or train of thought is carried on within a special 'universe of discourse,' or under a certain *suppositio*, we may say that *within the given suppositio every term has a contradictory*, and that every predication concerning a term implies some predication concerning its contradictory. But the name of the *suppositio* itself has no contradictory, except with reference to a wider and inclusive *suppositio*.

The difficulty of actual reasoning, not with symbols, but about matters of fact, does not arise from the principles of Logic, but
sometimes from the obscurity or complexity of the facts,
sometimes from the ambiguity or clumsiness of language,
sometimes from the deficiency of our own minds in penetration, tenacity and lucidity. One must do one's best to study the facts, and not be too easily discouraged.