could not exist until the conclusion was problematically recognized; this is inductive or experimental inference. Such a relation (2) may be altogether irrespective of whether the conclusion is recognized or not, yet such that it could not subsist if the concluded fact were not probable; this is probable deduction. Such a relation (3) may consist merely in the premised facts having some character, which may agree with, or be in some other relation to, a character which the concluded fact would possess if it existed; this is presumptive inference.

(1) The first case is that in which we begin by asking how often certain described conditions will, in the long run of experience, be followed by a result of a predesignate description; then proceeding to note the results as events of that kind present themselves in experience; and finally, when a considerable number of instances have been collected, inferring that the general character of the whole endless succession of similar events in the course of experience will be approximately of the character observed. For that endless series must have some character; and it would be absurd to say that experience has a character which is never manifested. But there is no other way in which the character of that series can manifest itself than while the endless series is still incomplete. Therefore, if the character manifested by the series up to a certain point is not that character which the entire series possesses, still as the series goes on, it must eventually tend, however irregularly, towards becoming so; and all the rest of the reasoner's life will be a continuation of this inferential process. This inference does not depend upon any assumption that the series will be endless, or that the future will be like the past, or that nature is uniform, nor upon any material assumption whatever. Cf. INDUCTION, and UNIFORMITY OF NATURE.

Logic imposes upon us two rules in performing this inference. The first is this: so far as in us lies, the conditions of the experience should remain the same. For we are reasoning exclusively from *experience*, that is, from the cognitions which the history of our lives *forces* upon us. So far as our will is allowed to interfere, it is not experience; so we must take pains that we do not, in taking the instances from which we are to reason, restrict the conditions or relax them from those to which the question referred. The second prescription of logic is that the conclusion be confined strictly to the question.

If the instances examined are found to be remarkable in any other respect than that for which they were selected, we can draw no inference of the present kind from that. It would be merely an infinitely weaker inference of the third kind (below). The present kind of inference derives its great force from the circumstance that the result is virtually predicted.

(2) The second kind of probable inference is, by the definition of it, necessary inference. But necessary inference may be applied to probability as its subject-matter; and it then becomes, under another aspect, probable inference. If of an endless series of possible experiences a definite proportion will present a certain character (which is the sort of fact called an objective probability), then it necessarily follows that, foreseen or not, approximately the same proportion of any finite portion of that series will present the same character, either as it is, or when it has been sufficiently extended. This is governed by precisely the same principle as the inductive inference, but applied in the reverse way. The same prescriptions of logic apply as before; but, owing to that being now inferred which was in the other case a premise, and conversely, it is not here true that the relation of the facts laid down in the premises to the fact stated in the conclusion, which makes the former significant of the latter, requires the recognition of the conclusion. This is probable deduction. It covers all the ordinary and legitimate applications of the mathematical doctrine of PROBABILITY (q. v.).

The legitimate results of the calculus of probability are of enormous importance, but others are unfortunately vitiated by confusing mere likelihood, or subjective probability, with the objective probability to which the theory ought to be restricted. An objective probability is the ratio in the long run of experience of the number of events which present the character of which the probability is predicated to the total number of events which fulfil certain conditions often not explicitly stated, which all the events considered fulfil. But the majority of mathematical treatises on probability follow Laplace in results to which a very unclear conception of probability led him. Laplace and other mathematicians, though they regard a probability as a ratio of two numbers, yet, instead of holding that it is the limiting ratio of occurrences of different kinds in the course of experience, hold that it is the ratio between numbers of 'cases,' or special

suppositions, whose 'possibilities' (a word not clearly distinguished, if at all, from 'probabilities') are equal in the sense that we are aware of no reason for inclining to one rather than to another. This is an error often appearing in the books under the head of 'inverse probabilities' (see that subject under PROBABILITY, where the view of Laplace is criticized).

(3) Probable inference of the third kind includes those cases in which the facts asserted in the premises do not compel the truth of the fact concluded, and where the significant observations have not been suggested by the consideration of what the consequences of the conclusion would be, but have either suggested the conclusion or have been remarked during a search in the facts for features agreeable or conflicting with the conclusion. The whole argument then reduces itself to this, that the observed facts show that the truth is *similar* to the fact asserted in the conclusion. This may, of course, be reinforced by arguments of some other kind; but we shall begin by considering the case in which it stands alone. As an example to fix ideas, suppose that I am reading a long anonymous poem. As I proceed, I meet with trait after trait which seems as if the poem were written by a woman. In what way do the premises justify the acceptance of that conclusion, and in what sense? It does not necessarily, nor with any necessitated objective probability, follow from the premises; nor must the method eventually lead to the truth. The only possible justifications it might have would be that the acceptance of the conclusion or of the method might necessarily conduce, in the long run, to such attainment of truth as might be possible by any means, or else to the attainment of some other purpose. All these alternatives ought to be carefully examined by the logician in order that he may be assured that no mode of probable inference has been overlooked.

It appears that there is a mode of inference in which the conclusion is accepted as having some chance of being true, and as being at any rate put in such a form as to suggest experimentation by which the degree of its truth can be ascertained. The only method by which it can be proved that a method, without necessarily leading to the truth, has some tolerable chance of doing so, is evidently the empirical, or inductive, method. Hence, as induction is proved to be valid by necessary deduction, so this presumptive inference must be proved valid by induction from experience.

The presumptive conclusion is accepted only problematically, that is to say, as meriting an inductive examination. The principal rule of presumption is that its conclusion should be such that definite consequences can be plentifully deduced from it of a kind which can be checked by observation. Among the wealth of methods to which this kind of inference (perhaps by virtue of its experiential origin) gives birth, the best deserving of mention is that which always prefers the hypothesis which suggests an experiment whose different possible results appear to be, as nearly as possible, equally likely.

Among probable inferences of mixed character, there are many forms of great importance. The most interesting, perhaps, is the argument from ANALOGY (q. v.), in which, from a few instances of objects agreeing in a few well-defined respects, inference is made that another object, known to agree with the others in all but one of those respects, agrees in that respect also. (C.S.P.)

Probation (in theology) [Lat. *probatio*, a test]: Ger. *Prüfung*; Fr. *épreuve*; Ital. *tempo di prova*. The state of moral trial in which the soul of man exists during the time that the offer of salvation is open to it.

The belief of the great majority of Christians is that probation ends with this life. The Catholic doctrine of purgatory is no exception, inasmuch as purgatory is conceived to be a place of purification, not of trial. The belief is entertained by many, however, that the period of trial does not end with death, but extends indefinitely into the future.

Literature: HODGE, Theology; DORNER, Christl. Glaubenslehre (1880); FARRAR, Eternal Hope; MARTINEAU, Christ. Dogmatics. (A.T.O.)

Problem [Gr. πρόβλημα, from πρό + βάλλειν, to cast]: Ger. *Problem*; Fr. *problème*; Ital. *problema*. (1) A question set forth for discussion with a view to a true and logically satisfactory answer; a 'dialectic theorem.' See Aristotle, *Topics*, I. xi. 101 b 1.

(2) A demonstrable practical proposition that something is possible. The solution usually consists in showing how it is possible and can be brought about. (C.S.P.)

Problematic [for deriv. see PROBLEM; the word was not in use in Gr. or Lat., though it may possibly occur]: Ger. *problematisch*; Fr. *problématique*; Ital. *problematico*. (1) The adjective imparting the lowest of the three grades of MODALITY (q.v.; see

also under POSSIBILITY) in the Kantian and derived systems of logic.

(2) In Greek it would mean pertaining to a problem; but the actual meaning, which is loose, is approximating to the import of an interrogation.

Sigwart and others maintain that problematic propositions are not propositions, because they are not assertory. If they are empty, their denials should be absurd, which does not seem to be the case. It is better to say that whatever presses as a question so much as to merit examination may properly be termed problematic. (C.S.P.)

Problematic Idealism: see SOLIPSISM.

Procedure (in law) [Lat. *procedere*, to proceed, through Fr.]: Ger. *Rechtsgang, Verfahren, Rechtsverhandlung*; Fr. *procédure*; Ital. *procedura*. The means provided by law for enforcing rights through the action of judicial or administrative tribunals. It includes all matters of process, pleading, practice, and evidence.

(2) The formal mode in which the functions of any branch of government are discharged.

Reformed procedure: an American system of simplified or 'Code' pleading, initiated in New York in 1848, and adopted in England by the Judicature Act of 1872.

In early societies rights often spring from forms. 'It would not be untrue to assert that in one stage of human affairs, rights and duties are rather the adjective of procedure than procedure a mere appendage to rights and duties' (Maine, *Early Hist. of Inst.*, lect. ix. 252. (S.E.B.)

Process [Lat. *procedere*, to proceed]: Ger. *Prozess*; Fr. *procès, processus*; Ital. *processo*. Continuous Change (q.v.). (J.M.B.)

Process (mental): Ger. *psychischer Prozess*; Fr. *processus psychique* (or *mental*); Ital. *processo psichico* (or *mentale*). Continuous change in consciousness, or in mental disposition, or in both.

The continuity of mental process is of two kinds: temporal continuity and dispositional continuity, or continuity of interest. By temporal continuity is meant the fact that each state passes into that which succeeds it without a break in time. By continuity of interest is meant the fact that successive states of consciousness may be stages in the development of a single conative tendency. Continuity of interest may exist without continuity in time, and continuity in time may exist without continuity of interest. I can to-day resume a problem at the point where I left it yesterday. In spite of the interval of time, yesterday's train of thought and to-day's have continuity of interest. Again, while meditating on my problem my attention may be diverted by the arrival of a visitor. There is temporal continuity between my mental processes in attacking the problem and in entertaining my guest; but there is discontinuity of interest. Continuity of interest constitutes in part the bond between one individual consciousness and another, which makes possible which is called the 'collective' mind. I may work at my problem up to a certain point, and then communicate my method and results to another. He may continue the same train of thought, and in his turn communicate his results to me. In this way we may solve the problem in co-operation. Our minds act as if they were one mind, so far as concerns the attainment of the end which we both pursue. This kind of co-operation in thinking and willing constitutes the psychical organism of human society, and binds together the successive generations of mankind. The process, however, though divided among different minds, is individual, not social. Cf. SOCIAL ORGANIZATION, SOCIAL PROCESS, and TRADITION.

Other forms of distinguishable mental process, such as cognition and feeling, have continuity also, which can probably in all cases be reduced to temporal merely (as emotional change produced by external events), or to dispositional merely (as in the continuity of a disturbed cognitive process), or to these two existing together. The further question of the reduction of all phenomenal continuity in change to a principle itself not subject to change, as well as the attempt to consider mental process as an independent system of self-produced changes, leads into metaphysics. (G.F.S.-J.M.B.)

Process (social): see SOCIAL PROCESS.

Proclus. (412–85 A.D.) Educated at Xanthus in Lycia, at Alexandria, and at Athens. Became a celebrated teacher, and died at Athens. The last of the Neo-Platonists to exercise any considerable influence. Cf. NEO-PLATONISM, and ALEXANDRIAN SCHOOL.

Procreation: see REPRODUCTION (in biology).

Prodicus. Born on the island of Ceos in the 4th century B.C. He was a teacher of virtue or the art of living, a Sophist, and taught for money at Athens.

Prodigality of Nature. Darwin's expression (*Origin of Species*) for EXCESS or