only the principle of cause and effect, and which deny purposiveness to the universe. Technically, various forms of it have been recognized. (1) Logical (also metaphysical) necessity: the necessity of thought in virtue of which a truth, either immediate or inferential, must be conceived in such and such a manner; thus freedom itself would be a logical necessity if it followed, in accordance with the principles of identity and non-contradiction, from conceded premises. (2) Mathematical necessity: the similar logical relationship of parts of a demonstration or construction in mathematical reasoning. (3) Physical (also natural) necessity: that which arises from laws of nature or which arises in the course of nature from the principle of causation: mechanism, the 'reign of law'; invariable sequence, according to modern writers, e.g. J. S. Mill. (4) Moral necessity: that required by moral law, by the moral order of the universe; that which follows from the nature of God as a moral governor; also used in a narrower sense, as equivalent to 'practical' necessity, which is neither logical nor physical, but the result of a certain need or demand regarded as of fundamental importance (see POSTULATE).

These distinctions we owe directly to Leibnitz, and they are most fully developed in his *Théodicée*. According to him there are three main types. (*a*) Metaphysical, logical, geometrical: that which cannot be otherwise than as it is without self-contradiction; absolute necessity. (*b*) Physical necessity: that of the order of nature, which might conceivably be otherwise, but which follows from the will of God, who has chosen the best world; hypothetical necessity. (*c*) Moral necessity: that which animates a moral being, even God himself, in the choice of good. Since a perfectly moral being would have a perfectly adequate conception of the good, it would by moral necessity choose it. In this sense, physical necessity depends upon moral necessity. The term is also used in a strictly logical sense, equivalent to APODICTIC (q.v.), and also to designate the opposite of those theories which assert free will (necessitarianism: see DETERMINISM, and WILL).

In the Pre-Socratics, necessity was a quasi-mythical expression for the law or order of the cosmos, as in the teaching of Parmenides that the goddess at the centre of the world is Necessity—an (apparently) Pythagorean conception which finds expression in the myth of Er (Plato, *Rep.*, Bk. X), where the entire universe is made to revolve upon an axis of necessity. Heraclitus used the idea (in the form of destiny) to account for the fact that a certain balance and system is observed in all change. With the Atomists (Leucippus) it becomes (ἀνάγκη) a definite philosophical concept; the atoms, darting about at random, impinge upon one another; from the aggregations thus formed, there is, of necessity, a whirling motion set up. With Plato (aside from incidental and non-technical use of it as equivalent to the force of proof and demonstration) necessity is the co-author, with νοῦς, of the sensible world; as irrational it is blind, indifferent to good, since νοῦς alone is the principle of ends, or of the good, and hence that which keeps the world in a state of partial non-being and which prevents its arriving at completion (*Timaeus*, 48, 56, 68). Aristotle repeats the same idea (*De An. part.*, IV. ii. 677). Matter resists form, and thus hinders NATURE (q.v.) from arriving at its actualization. (The idea seems to be that in part matter lends itself to the realization of purposes, but in part has an impetus of its own which is quite indifferent to ends.) In this indifference matter is thus contingent—it may or may not present certain traits. As such it is τύχη, chance; so that necessity in the physical sense, and chance in the teleological, are practically one and the same thing. Hence, in his logical writings necessity has quite another meaning. Of future events, we cannot make a necessary assertion; the general tendency of nature may be thwarted by chance. Hence our judgment is not of determinate truth. On the other hand, of universals, of past events, &c., any judgment is either necessarily true or false. Here the tendency comes out to identify necessity with the immanent logical rationale of any subject, that from which perfectly definite consequences follow. The Stoics fuse the various senses of necessity—that of (*a*) the source of physical world-order, (*b*) the universal of reason from which determined conclusions result, and (*c*) the natural (or temporal) causal antecedent (Zeller, *Stoics, Epicureans, and Sceptics*, 170–82, and Windelband, *History*, 181). Since the Atomists did not work out their own idea systematically, and even presupposed a more or less random movement upon which necessity supervened, we may fairly regard the Stoics as the authors of the conviction that everything, everywhere, is controlled by necessity admitting of no exception—in other words, of the idea of the

universality of natural causation, which is fate. This conception is common to what is called fatalism, also, in oriental philosophies: the hypothesis of a fixed and immutable world decree.

Spinoza carries the fusion still further by expressly identifying the whole causal relationship with the logical or mathematical—the world follows from the nature of God by the same necessity that various truths follow from a geometrical definition. (It was partly in reaction from Spinoza that Leibnitz made the distinctions referred to above.) It was characteristic of the whole rationalistic school (see RATIONALISM) to identify reality with the requirements of logical necessity, as manifested in the principles of identity and non-contradiction; and if, like Leibnitz, they made a distinction between truths of reason and truths of matter of fact (which are empirical), and thus avoided the Spinozistic identification of logical relationship with natural sequence, it was a concession to common sense rather than a philosophic implication of their system. Kant introduces a new motive. On the one hand, growing natural science had given to the conception of necessity (causal relationship) in nature a solidity and concreteness which it could not have had in earlier writers; on the other hand, he rejects the dogmatic identification of the laws of being with those of logical thought. Hence his theory makes causality and thus necessity absolutely true of all nature, or the world of phenomena, by regarding causation as a category involved in the presentation of the world of sense to an experiencing subject. The source of necessity is thus found in the understanding as applied to sense; so that it may fairly be said that Kant restores in a critical and constructive way that which he had rejected in a dogmatic and formal way, namely, the origin of necessity in reason. At least, this path was followed by his idealistic successors, finding its outcome in the expression of Hegel (*Logic*, § 158), that 'freedom is the truth of necessity,' that is to say, that the determination of one phase of the objective world by another is at bottom but the self-determination of conscious mind, so that the necessary object, when experienced completely, appears as a co-operating factor in the development of free spiritual life. (J.D.)

Literature: Works on metaphysics and logic; G. TAROZZI, La dottrina della necessità (2 vols., 1895–7). (J.M.B., E.M.)

The following distinctions are usual:

Internal necessity springs from the nature of the subject of the necessity; *external necessity* comes from the outside.

Internal necessity is either *absolute* or *secundum quid*. *Absolute necessity* belongs to that whose being otherwise would involve contradiction. *Necessity secundum quid* is that which depends upon some matter of fact. Thus the Aristotelians held that a body falls to the ground by a necessity of its own nature, without external force or agency; yet it is easily prevented from falling.

External necessity, also called *necessity ex hypothesi*, because depending on an external condition, is distinguished in what manner ways the necessary is distinguished in the doctrine of the MODAL (q.v.), and, in particular, in reference to the *sensus compositus* and *sensus divisus*. In addition, external necessity is divided according as the realization of the condition precedes, is contemporaneous with, or follows after, the necessary result. Necessity from a previous condition is either that due to God's foreknowledge or it is *causal*. *Causal necessity* (used also in modern logic) is either *necessity of compulsion* or *necessity of determination*.

Necessity determined by a subsequent condition is either *ex hypothesi finis* or *ex hypothesi eventus* (as the apostle says, 'it is necessary that offences should come'). Necessity *ex hypothesi finis* is either *ad esse* or *ad bene esse*.

Another common distinction is between necessity *in causando*, *in essendo*, and *in praedicando*, phrases which explain themselves.

Still another threefold distinction, due to Aristotle (1 *Anal. post.*, iv), is between necessity *de omni* (τὸ κατὰ παντός), *per se* (καθ' αὐτό), and *universaliter primum* (καθόλου πρῶτον). The last of these, however, is unintelligible, and we may pass it by, merely remarking that the exaggerated application of the term has given us a phrase we hear daily in the streets, 'articles of prime necessity.' Necessity *de omni* is that of a predicate which belongs to its whole subject at all times. Necessity *per se* is one belonging to the essence of the species, and is subdivided according to the senses of *per se*, especially into the first and second modes of *per se*.

Among modern distinctions we may mention that of Benno Erdmann between *predicative* and *deductive* necessity. The former seems to be necessity for a judgment being as it is in order to express what is in its immediate object.

Logical necessity is determined by the laws

of the understanding, according to Kant (*Krit. d. reinen Vernunft*, 1. Aufl., 76).

Metaphysical necessity is that of God's existence.

Simple = *absolute necessity*. See above.

The adjectives by which different kinds of necessity are usually distinguished include absolute, antecedent, causal, comitant, composite, consequent, deductive, disjunct, disjunctive, external, formal, hypothetical, immediate, internal, logical, material, mediate, metaphysical, modal, moral, physical, practical, predicative, prime, simple, teleological, unconditional. (C.S.P.)

Necromancy: see MAGIC.

Need [AS. *nyd*]: Ger. *Bedürfniss*; Fr. *besoin*; Ital. *bisogno*. A constitutional or acquired craving or want, either bodily, revealing itself also in consciousness, or mental.

Needs are deep-seated demands of nature; appeased by recurrent satisfactions; extremely painful or depressing if not satisfied; and often acting as subconscious motives which influence action without taking form as conscious ends. (J.M.B., G.F.S.)

Negation [Lat. *negatio*, which translates Gr. *ἀπόφασις*]: Ger. *Verneinung*; Fr. *négation*; Ital. *negazione*. Negation is used (1) logically, (2) metaphysically. In the logical sense it may be used (*a*) relatively, and (*b*) absolutely. Used relatively, when applied to a proposition, it may be understood (*a*) as denying the proposition, or (*β*) as denying the predicate.

(1) In its logical sense, negation is opposed to affirmation, although, when it is used relatively, this is perhaps not a convenient contrary term; in its metaphysical sense, negative is opposed to positive (fact, &c.).

The conception of negation, objectively considered, is one of the most important of logical relations; but subjectively considered, it is not a term of logic at all, but is prelogical. That is to say, it is one of those ideas which must have been fully developed and mastered before the idea of investigating the legitimacy of reasonings could have been carried to any extent.

The treatment of the doctrine of negation affords a good illustration of the effects of applying the principle of PRAGMATISM (q.v.) in logic. The pragmatist has in view a definite purpose in investigating logical questions. He wishes to ascertain the general conditions of truth. Now, without of course undertaking to present here the whole development of thought, let it be said that it is found that the first step must be to define how two propositions can be so related that under all circumstances whatsoever,

The truth of the one entails the truth of the other,
The truth of the one entails the falsity of the other,
The falsity of the one entails the truth of the other,
The falsity of the one entails the falsity of the other.

This must be the first part of logic. It is deductive logic, or (to name it by its principal result) syllogistic. At all times this part of logic has been recognized as a necessary preliminary to further investigation. Deductive and inductive or methodological logic have always been distinguished; and the former has generally been called by that name.

In order to trace these relations between propositions, it is necessary to dissect the propositions to a certain extent. There are different ways in which propositions can be dissected. Some of them conduce in no measure to the solution of the present problem, and will be eschewed by the pragmatist at this stage of the investigation. Such, for example, is that which makes the copula a distinct part of the proposition. It may be that there are different ways of useful dissection; but the common one, which alone has been sufficiently studied, may be described as follows:

Taking any proposition whatever, as

'Every priest marries some woman to some man,'

we notice that certain parts may be struck out so as to leave a blank form, in which, if the blanks are filled by proper names (of individual objects known to exist), there will be a complete proposition (however silly and false). Such blank forms are, for example:

Every priest marries some woman to ——,
—— marries —— to some man,
—— marries —— to ——.

It may be that there is some language in which the blanks in such forms cannot be filled with proper names so as to make perfect propositions; because the syntax may be different for sentences involving proper names. But it does not matter what the rules of grammar may be.

The last of the above blank forms is distinguished by containing no selective word such as some, every, any, or any expression equivalent in force to such a word. It may be called a PREDICATE (q.v., sense 2) or *ῥῆμα*.

Corresponding to every such predicate there is another, such that if all the blanks in the two be filled with the same set of proper names (of individuals known to exist), one of the two resulting propositions will be true, while the other is false; as

Chrysostom marries Helena to Constantine;
Chrysostom non-marries Helena to Constantine.

It is true that the latter is not good grammar; but that is not of the smallest consequence. Two such propositions are said to be contradictories, and two such predicates to be negatives of one another, or each to result from the negation of the other. Two propositions involving selective expressions may be contradictories; but in order to be so, each selective has to be changed from indicating *a suitable selection* to indicating *any selection that may be made*, or vice versa. Thus the two following propositions are contradictories:

Every priest marries some woman to every man;
Some priest non-marries every woman to some man.

It is very convenient to express the negative of a predicate by simply attaching a *non* to it. If we adopt that plan, *non-non-marries* must be considered as equivalent to *marries*. It so happens that both in Latin and in English this convention agrees with the usage of the language. There is probably but a small minority of languages of the globe in which this very artificial rule prevails. Of two contradictory propositions each is said to result from the *negation* of the other.

The relation of negation may be regarded as defined by the principles of contradiction and excluded middle. See LAWS OF THOUGHT. That is an admissible, but not a necessary, point of view. Out of the conceptions of non-relative deductive logic, such as consequence, coexistence or composition, aggregation, incompossibility, negation, &c., it is only necessary to select two, and almost any two at that, to have the material needed for defining the others. What ones are to be selected is a question the decision of which transcends the function of this branch of logic. Hence the indisputable merit of Mrs. Frankin's eight copula-signs, which are exhibited as of co-ordinate formal rank. But, so regarded, they are not properly copulas or assertions of the relation between the several individual subjects and the predicate, but mere signs of the logical relations between different components of the predicate. The logical doctrine connected with those signs is of considerable importance to the theory of pragmatism.

For the negation of modals see MODAL.

Conversion by negation = CONTRAPOSITION (q.v.).

Negant or *negative negation* is the negation effected by attaching the negative particle to the copula in the usual Latin idiom, 'Socrates non est stultus,' in contradistinction to *infinite* (*ἀορίστη*), or *infinitant*, *negation*, which is effected by attaching the negative particle to the predicate, 'Socrates est non stultus.'

Kant revived this distinction in order to get a triad to make out the symmetry of his table of categories; and it has ever since been one of the deepest and dearest studies of German logicians. No idea is more essentially dualistic, and distinctly not triadic, than negation. *Not*-A = *other than* A = *a second thing to* A. Language preserves many traces of this. *Dubius* is between *two* alternatives, yea and nay.

(2) In the metaphysical sense, negation is the mere absence of a character or relation that is regarded as positive. It is distinguished from privation in not implying anything further.

Spinoza's celebrated saying, of which the Schellings have made so much, 'omnis determinatio est negatio,' has at least this foundation, that *determinatio* to one alternative excludes us from another. The same great truth is impressed upon youth in the utterance: 'You cannot eat your cake and have it too.' (C.S.P., C.L.F.)

Predicates are not denied to subjects at hazard—it would be a great waste of time to set forth in language the fact that the vast majority of predicates are inapplicable to the vast majority of subjects. In order that a negative statement may have any value, there must have been some reason to suppose that the affirmative statement of which it is the exact denial was true, either that it had been proposed for our acceptance by an interlocutor, that it had been part of our stored-up knowledge or purported knowledge, or that we had in mind what we took at the moment to be sufficient ground for its acceptance. Sigwart is, therefore, right in maintaining that the negative statement, in its origin, is not of the same primitiveness as the affirmative statement; '*a* is not *b*' is merely a