Induction may, therefore, be defined as argument which assumes that a whole collection, from which a number of instances have been taken at random, has all the common characters of those instances; hypothesis, as an argument which assumes that a term which necessarily involves a certain number of characters, which have been lighted upon as they occurred, and have not been picked out, may be predicated of any object which has all these characters.

There is a resemblance between the transposition of propositions by which the forms of probable inference are derived and the contraposition by which the indirect figures are derived; in the latter case there is a denial or change of modal quality; while in the former there is reduction from certainty to probability, and from the sum of all results to some only, or a change in modal quantity. Thus probable inference is, related to apagogical proof, somewhat as the third figure is to the second. Among probable inferences, it is obvious that hypothesis corresponds to the second figure, induction to the third, and analogy to the second-third.

Five hundred and eighty-second Meeting.
May 14, 1867. — Monthly Meeting.

The President in the chair.

The Corresponding Secretary read letters relative to exchanges.

The President read a letter from Dr. J. Mason Warren, presenting to the Academy a copy of his work on "Surgical Operations."

The following paper was presented:

On a New List of Categories. By C. S. Peirce.

§ 1. This paper is based upon the theory already established, that the function of conceptions is to reduce the manifold of sensuous impressions to unity, and that the validity of a conception consists in the impossibility of reducing the content of consciousness to unity without the introduction of it.

§ 2. This theory gives rise to a conception of gradation among these conceptions which are universal. For one such conception may unite the manifold of sense and yet another may be required to unite the conception and the manifold to which it is applied; and so on.
§ 3. That universal conception which is nearest to sense is that of the present, in general. This is a conception, because it is universal. But as the act of attention has no connotation at all, but is the pure denotive power of the mind, that is to say, the power which directs the mind to an object, in contradistinction to the power of thinking any predicate of that object, — the conception of what is present in general, which is nothing but the general recognition of what is contained in attention, has no connotation, and therefore no proper unity. This conception of the present in general, or it in general, is rendered in philosophical language by the word “substance” in one of its meanings. Before any comparison or discrimination can be made between what is present, what is present must have been recognized as such, as it, and subsequently the metaphysical parts which are recognized by abstraction are attributed to this it, but the it cannot itself be made a predicate. This it is neither predicated of a subject, nor in a subject, and accordingly is identical with the conception of substance.

§ 4. The unity to which the understanding reduces impressions is the unity of a proposition. This unity consists in the connection of the predicate with the subject; and, therefore, that which is implied is the copula, or the conception of being, is that which completes the work of conceptions of reducing the manifold to unity. The copula (or rather the verb which is copula in one of its senses) means either actually is or would be, as in the two propositions, “There is no griffin,” and “A griffin is a winged quadruped.” The conception of being contains only that juncture of predicate to subject wherein these two verbs agree. The conception of being, therefore, plainly has no content.

If we say “The stove is black,” the stove is the substance, from which its blackness has not been differentiated, and the is, while it leaves the substance just as it was seen, explains its confusion, by the application to it of blackness as a predicate.

Though being does not affect the subject, it implies an indefinite determinability of the predicate. For if one could know the copula and predicate of any proposition, as “... is a tailed-man,” he would know the predicate to be applicable to something possible, at least. Accordingly, we have propositions whose subjects are entirely indefinite, as “There is a beautiful ellipse,” where the subject is merely something actual or potential; but we have no propositions whose predicate is entirely indeterminate, for it would be quite senseless to say, “A has the common characters of all things,” inasmuch as there are no such common characters.

Thus substance and being are the beginning and end of all conception. Substance is inapplicable to a predicate, and being is equally so to a subject.

§ 5. The terms “precision” and “abstraction,” which were formerly applied to every kind of separation, are now limited, not merely to mental separation, but to that which arises from attention to one element and neglect of the other. Exclusive attention consists in a definite conception or supposition of one part of an object, without any supposition of the other. Abstraction or precision ought to be carefully distinguished from two other modes of mental separation, which may be termed discrimination and dissociation. Discrimination has to do merely with the essences of terms, and only draws a distinction in meaning. Dissociation is that separation, which, in the absence of a constant association, is permitted by the law of association of images. It is the consciousness of one thing, without the necessary simultaneous consciousness of the other. Abstraction or precision, therefore, supposes a greater separation than discrimination, but a less separation than dissociation. Thus I can discriminate red from blue, space from color, and color from space, but not red from color. I can prescind red from blue, and space from color (as is manifest from the fact that I actually believe there is an uncolored space between my face and the wall); but I cannot prescind color from space, nor red from color. I can dissociate red from blue, but not space from color, color from space, nor red from color.

Precision is not a reciprocal process. It is frequently the case, that, while A cannot be prescinded from B, B can be prescinded from A. This circumstance is accounted for as follows. Elementary conceptions only arise upon the occasion of experience; that is, they are produced for the first time according to a general law, the condition of which is the existence of certain impressions. Now if a conception does not reduce the impressions upon which it follows to unity, it is a mere arbitrary addition to these latter; and elementary conceptions do not arise thus arbitrarily. But if the impressions could be definitely comprehended without the conception, this latter would not reduce them to unity. Hence, the impressions (or more immediate conceptions) cannot be definitely conceived or attended to, to the neglect of an elementary conception which reduces them to unity. On the other
hand, when such a conception has once been obtained, there is, in
general, no reason why the premises which have occasioned it should
not be neglected, and therefore the explaining conception may fre-
quently be prescinded from the more immediate ones and from the
impressions.

§ 6. The facts now collected afford the basis for a systematic method
of searching out whatever universal elementary conceptions there may
be intermediate between the manifold of substance and the unity of
being. It has been shown that the occasion of the introduction of a
universal elementary conception is either the reduction of the manifold
of substance to unity, or else the conjunction to substance of another
conception. And it has further been shown that the elements conjoined
cannot be supposed without the conception, whereas the conception
can generally be supposed without these elements. Now, empirical
psychology discovers the occasion of the introduction of a conception,
and we have only to ascertain what conception already lies in the data,
which is united to that of substance by the first conception, but which
cannot be supposed without this first conception, to have the next con-
ception in order in passing from being to substance.

It may be noticed that, throughout this process, introspection is not
resorted to. Nothing is assumed respecting the subjective elements
of consciousness which cannot be securely inferred from the objective
elements.

§ 7. The conception of being arises upon the formation of a propo-
sition. A proposition always has, besides a term to express the sub-
stance, another to express the quality of that substance; and the
function of the conception of being is to unite the quality to the sub-
stance. Quality, therefore, in its very widest sense, is the first concep-
tion in order in passing from being to substance.

Quality seems at first sight to be given in the impression. Such
results of introspection are trustworthy. A proposition asserts the
applicability of a mediate conception to a more immediate one. Since
this is asserted, the more mediate conception is clearly regarded inde-
pendently of this circumstance, for otherwise the two conceptions would not
be distinguished, but one would be thought through the other, without
this latter being an object of thought, at all. The mediate conception,
then, in order to be asserted to be applicable to the other, must first be
considered without regard to this circumstance, and taken immediately.

But, taken immediately, it transcends what is given (the more imme-
diate conception), and its applicability to the latter is hypothetical.

Take, for example, the proposition, "This stove is black." Here the
conception of this stove is the more immediate, that of black the more
mediate, which latter, to be predicated of the former, must be discrimi-
nated from it and considered in itself, not as applied to an object,
but simply as embodying a quality, blackness. Now this blackness is a
pure species or abstraction, and its application to this stove is entirely
hypothetical. The same thing is meant by "the stove is black," as by
"there is blackness in the stove." Embodying blackness is the equiv-
alent of black.* The proof is this. These conceptions are applied
indifferently to precisely the same facts. If, therefore, they were dif-
ferent, the one which was first applied would fulfill every function of
the other; so that one or them would be superfluous. Now a super-
fluous conception is an arbitrary fiction, whereas elementary concep-
tions arise only upon the requirement of experience; so that a super-
fluous elementary conception is impossible. Moreover, the conception of
a pure abstraction is indispensable, because we cannot comprehend an
agreement of two things, except as an agreement in some respect, and
this respect is such a pure abstraction as blackness. Such a pure
abstraction, reference to which constitutes a quality or general attribute,
may be termed a ground.

Reference to a ground cannot be prescinded from being, but being
can be prescinded from it.

§ 8. Empirical psychology has established the fact that we can know a
quality only by means of its contrast with or similarity to another. By
contrast and agreement a thing is referred to a correlate, if this term
may be used in a wider sense than usual. The occasion of the intro-
duction of the conception of reference to a ground is the reference
to a correlate, and this is, therefore, the next conception in order.

Reference to a correlate cannot be prescinded from reference to a
ground; but reference to a ground may be prescinded from reference
to a correlate.

§ 9. The occasion of reference to a correlate is obviously by com-
parison. This act has not been sufficiently studied by the psycholo-
rists, and it will, therefore, be necessary to adduce some examples to
show in what it consists. Suppose we wish to compare the letters

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* This agrees with the author of "De Generibus et Speciobus," Ouvrages Inédits
  d'Abeilard, p. 328.
p and b. We may imagine one of them to be turned over on the line of writing as an axis, then laid upon the other, and finally to become transparent so that the other can be seen through it. In this way we shall form a new image which mediates between the images of the two letters, inasmuch as it represents one of them to be (when turned over) the likeness of the other. Again, suppose we think of a murderer as being in relation to a murdered person; in this case we conceive the act of the murder, and in this conception is represented that corresponding to every murderer (as well as to every murderer) there is a murdered person; and thus we resort again to a mediating representation which represents the relate as standing for a correlate with which the mediating representation is itself in relation. Again, suppose we look out the word homme in a French dictionary; we shall find opposite to it the word mas, which, so placed, represents homme as representing the same two-legged creature which man itself represents. By a further accumulation of instances, it would be found that every comparison requires, besides the related thing, the ground, and the correlate, also a mediating representation which represents the relate to be a representation of the same correlate which this mediating representation itself represents. Such a mediating representation may be termed an interpretant, because it fulfills the office of an interpreter, who says that a foreigner says the same thing which he himself says. The term representation is here to be understood in a very extended sense, which can be explained by instances better than by a definition.

In this sense, a word represents a thing to the conception in the mind of the hearer, a portrait represents the person for whom it is intended. The conception of recognition, a weathercock represents the direction of the wind to the conception of him who understands it, a barrister represents his client to the judge and jury whom he influences.

Every reference to a correlate, then, conjoins to the substance the conception of a reference to an interpretant; and this is, therefore, the next conception in order in passing from being to substance.

Reference to an interpretant cannot be preceded from reference to a correlate; but the latter can be preceded from the former.

§ 10. Reference to an interpretant is rendered possible and justified by that which renders possible and justifies comparison. But that is clearly the diversity of impressions. If we had but one impression, it would not require to be reduced to unity, and would therefore not need to be thought of as referred to an interpretant, and the conception of reference to an interpretant would not arise. But since there is a manifold of impressions, we have a feeling of complication or confusion, which leads us to differentiate the impression from that, and then, having been differentiated, they require to be brought to unity. Now they are not brought to unity until we conceive them together as being ours, that is, until we refer them to a conception as their interpretant. Thus, the reference to an interpretant arises upon the holding together of diverse impressions, and therefore it does not join a conception to the substance, as the other two references do, but unites directly the manifold of the substance itself. It is, therefore, the last conception in order in passing from being to substance.

§ 11. The five conceptions thus obtained, for reasons which will be sufficiently obvious, may be termed categories. That is,

BEING,
- Quality (Reference to a Ground),
- Relation (Reference to a Correlate),
- Representation (Reference to an Interpretant),

SUBSTANCE.

The three intermediate conceptions may be termed accidents.

§ 12. This passage from the many to the one is numerical. The conception of a third is that of an object which is so related to two others, that one of these must be related to the other in the same way in which the third is related to that other. Now this coincides with the conception of an interpretant. An other is plainly equivalent to a correlate. The conception of second differs from that of other, in implying the possibility of a third. In the same way, the conception of self implies the possibility of an other. The Ground is the self abstracted from the concreteness which implies the possibility of another.

§ 13. Since no one of the categories can be preceded from those above it, the list of supposable objects which they afford is

What is,
- Qualis — that which refers to a ground,
- Relate — that which refers to ground and correlate,
- Representamen — that which refers to ground, correlate, and interpretant.

It

§ 14. A quality may have a special determination which prevents
its being preceded from reference to a correlate. Hence there are two kinds of relation.

1st. That of relates whose reference to a ground is a prescindible or internal quality.

2d. That of relates whose reference to a ground is an unprescindible or relative quality.

In the former case, the relation is a mere concurrence of the correlates in one character, and the relate and correlate are not distinguished. In the latter case the correlate is set over against the relate, and there is in some sense an opposition.

Relates of the first kind are brought into relation simply by their agreement. But mere disagreement (unrecognized) does not constitute relation, and therefore relates of the second kind are only brought into relation by correspondence in fact.

A reference to a ground may also be such that it cannot be preceded from a reference to an interpretant. In this case it may be termed an imputed quality. If the reference of a relate to its ground can be preceded from reference to an interpretant, its relation to its correlate is a mere concurrence or community in the possession of a quality, and therefore the reference to a correlate can be preceded from reference to an interpretant. It follows that there are three kinds of representations.

1st. Those whose relation to their objects is a mere community in some quality, and these representations may be termed Likenesses.

2d. Those whose relation to their objects consists in a correspondence in fact, and these may be termed Indices or Signs.

3d. Those the ground of whose relation to their objects is an imputed character, which are the same as general signs, and these may be termed Symbols.

§ 15. 8 shall now show how the three conceptions of reference to a ground, reference to an object, and reference to an interpretant are the fundamental ones of at least one universal science, that of logic. Logic is said to treat of second intentions as applied to first. It would lead me too far away from the matter in hand to discuss the truth of this statement; I shall simply adopt it as one which seems to me to afford a good definition of the subject-genus of this science. Now, second intentions are the objects of the understanding considered as representations, and the first intentions to which they apply are the objects of those representations. The objects of the understanding, considered as representations, are symbols, that is, signs which are at least potentially general. But the rules of logic hold good of any symbols, of those which are written or spoken as well as of those which are thought. They have no immediate application to likenesses or indices, because no arguments can be constructed of these alone but do apply to all symbols. All symbols, indeed, are in one sense relative to the understanding, but only in the sense in which also all things are relative to the understanding. On this account, therefore, the relation to the understanding need not be expressed in the definition of the sphere of logic, since it determines no limitation of that sphere. But a distinction can be made between concepts which are supposed to have no existence except so far as they are actually present to the understanding, and external symbols which still retain their character of symbols so long as they are only capable of being understood. And as the rules of logic apply to these latter as much as to the former, (and though only through the former, yet this character, since it belongs to all things, is no limitation,) it follows that logic has for its subject-genus all symbols and not merely concepts. We come, therefore, to this, that logic treats of the reference of symbols in general to their objects. In this view it is one of a trivium of conceivable sciences. The first would treat of the formal conditions of symbols having meaning, that is of the reference of symbols in general to their grounds or imputed characters, and this might be called formal grammar; the second, logic, would treat of the formal conditions of the truth of symbols; and the third would treat of the formal conditions of the force of symbols, or their power of appealing to a mind, that is, of their reference in general to interpretants, and this might be called formal rhetoric.

There would be a general division of symbols, common to all these sciences; namely, into,

1st. Symbols which directly determine only their grounds or imputed qualities, and are thus but sums of marks or terms;
Symbols which also independently determine their objects by means of other terms or terms, and thus, expressing their own objective validity, become capable of truth or falsehood, that is, are propositions; and symbol.

Symbols which also independently determine their interpreters, and thus, the minds to which they appeal, by previewing a proposition or propositions which such a mind is to admit. These are arguments.

And it is remarkable that, among all the definitions of the proposition, for example, as the _ordo rei_, as the basis of an object under a concept, as the expression of the relation of two concepts, and as the indication of the imitable ground of appearance; there is, perhaps, not one in which the conception of reference, to an object or correlate is not the important one. In the same way, the conception of reference to an interpretant or third, is always prominent in the definitions of argument.

In a proposition, the term which separately indicates the object of the symbol is termed the subject, and that which indicates the ground is termed the predicate. The objects indicated by the subject (which are always potentially a plurality,—at least, of phases or appearances) are therefore stated by the proposition to be related to one another on the ground of the character indicated by the predicate. Now this relation may be either a concurrence or an opposition. Propositions of concurrence are those which are usually considered in logic, but I have shown in a paper upon the classification of arguments that it is also necessary to consider separately propositions of opposition, if we are to take account of such arguments as the following:

Whatever is the half of anything is less than that of which it is the half.

\[ A \text{ is half of } B; \]
\[ \therefore A \text{ is less than } B. \]

The subject of such a proposition is separated into two terms, a "subject nominative" and an "object, accusative."

In an argument, the premises form a representation of the conclusion, because they indicate the interpretants of the argument, or representation representing it to represent its object. The premises may afford a likeness, index, or symbol of the conclusion. In deductive argument, the conclusion is represented by the premises as by a general sign under which it is contained. In hypotheses, something
which, according to our analysis, are the most fundamental ones found in the sphere of logic. It is believed, however, that it is sufficient to show that at least something may be usefully suggested by considering this science in this light.

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**Fifty hundred and eighty-third Meeting.**

**May 23, 1867. — Annual Meeting.**

The President in the chair.

The following Report of the Council upon the changes which had occurred in the Academy during the past year was presented.

In surveying the events of the past year, as respects the membership of the Academy, the Council would first call attention to the losses which we have sustained, and would put upon record some brief tribute to the memory of our deceased associates. We have lost six Fellows, two Associate Fellows, and one Foreign Honorary Member,—nine in all.

Four of the six taken from our immediate circle, Messrs. Hayward, Mussey, Swett, and Jenks, were well advanced in years; two, Dr. Gould and Dr. Bryant, were suddenly removed from active life and stations which they might have been expected much longer to adorn. All have left names and memories to be affectionately cherished by this society.

**James Hayward** was born in Concord, Massachusetts, in the year 1786, and died July 27, 1866. His youth was passed on his father's farm, first in Concord, and afterwards in Plainfield, Hampshire County, to which place his father removed when James was eight years old. Anxious to obtain a liberal education, he left his home at the age of eighteen, in the hope of finding in Boston employment that would give him the means of accomplishing his purpose. After three years of fruitless effort he returned to his old home, and took the management of his father's farm, teaching school in winter, and studying at intervals. It was not until 1815, when he was twenty-nine years old, that he was able to carry out his purpose of entering college at Cambridge. Graduating in 1819, he entered the Divinity School, and went through its course, but having been appointed tutor in mathematics in the Col-