

Charles Peirce
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(Writings of Charles S. Peirce 1, 162-175)

[NOTE: Peirce's occasionally erratic punctuation, capitalization, and paragraphing -- typical of his written lectures -- is left unmodified.]

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Though I ask your attention to one of the studies of the ancient Trivium -- a study therefore according both to etymology and long prejudice, trivial -- I trust I need not at this day defend it from the charge of piddling. It is now pretty plain that though modern science has scorned the scholastic terminology, it has either continued to employ or has been forced to relearn the ideas that terminology conveyed, having simply thrown away the advantage of exact expressions. Logic in itself, however, has never been contemned by profound minds. It was a particular scheme of logic and not the science itself against which Bacon protested (see Aphorism XI); hence, he proceeds at once to substitute for that scheme another of his own, -- and that intended to be a strictly logical one as I shall hereafter show. In the same way the reform of Ramus, therefore of Kant and all the reforms of science have been logical reforms. The Ramists sneered at the scholastics, the modern natural theorists sneer at both, and certain persons are now beginning to sneer at the natural theorists. Another reform seems to be coming: it is in the air. Several logical questions are already under discussion by scientific men. Naturalists are divided into two classes, more according to Lyell upon a logical question than anything else. An eminent mathematician has proposed a reform of the most important part of the theory of probabilities on logical grounds. And physicists ought not to feel too secure of the logical character of the hypothesis of impenetrability and its consequences which has already been attacked by men of high standing. On this account, I believe that there are not *now* many thoughtful men of science who will think that the investigation of the logical character of scientific reasoning is a needless or unimportant inquiry.

These lectures will take up two points in order,

- 1st The degree and character of scientific ratiocination. |163|
- 2nd The degree and character of scientific primitive principles.

The first point will be considered in this order.

- 1st The conception of logic.
- 2nd A theory of induction developed out of Aristotle's, which I prefer.
- 3rd The study of the modern theories of Boole, Apelt, Herschel, Graty, Whewell, and Mill.
- 4th The theory of Bacon.

The second point will be considered in this order.

- 1st The full preservations of Kant's theory of this subject.
- 2nd Consideration of the effect of modern researches in modifying this theory.

The one great source of error in all attempts to make a Logic of Science has been utter misconception of the nature and definition of logic. All the pure and formal logicians agree upon that. What then is logic? Of course, the definitions of a subject which has been pursued with ability for two thousand years and more have been very various. They may however be divided into two classes; those which do not and those which do give to logic a psychological or human character.

Of the unpsychological views there are several that occur to me as interesting. In the first place, there is the definition attributed rather doubtfully to Aristotle that Logic is the science of Demonstration. Spalding in the *Encyclopaedia Britannica* declares that it is the "theory of inference" which comes to the same thing. But apart from the narrowness of this view, in identifying Logic with Syllogistic, these are mere word definitions since they do not explain the nature of inference or demonstration. St. Augustine calls it the science of truth. Several writers of the *renaissance* (Peter Molyneux, Vossius) and at last one modern one, Reimarus (1790), have advocated this definition. There is great merit in the view, but it is too broad; for logic does not consider how an object or idea may be presented but only how it may be represented; **eyesight**, that is to say, and **inspiration** are both beyond the province of logic. Another curious definition is that of Hobbes. "Ratiocination is Computation." A very remarkable and profound conception.

Of the psychological definitions, the commonest is that of Cicero which was adopted by Ramus. "Dialectica est ars se tradere bene disserendi." The Hindoo definition agrees with this. This identification of logic with the art of discussion, is at once the narrowest and lowest |164| view of the subject which has ever been taken. But Melanchthon's definition "Ars et via docendi" is scarcely better. Another definition once in high favour is "ars dirigendi mentem in cognitione rerum." This is a step higher but is radically faulty in making it a collection of maxims instead of inviolable laws. Since Kant, there has been a vast majority of the suffrages of logicians in favor of his definition which is as follows -- the science of the necessary laws of the Understanding and Reason -- or what is the same thing -- the science of the sheer Form of thought in general. Observe the two branches of this statement the former more psychological the latter scarcely at all so; one has two faculties and their capacities; the other thoughts as **objects** with forms. This is certainly the best definition yet given. It has been more or less modified in one way or other by subsequent logicians but not essentially by any one who knows logic. One may say it is the science of the normative laws of human cognition. Another that it is the science of the relations of Conceptions. Another that it is the science of the laws of formal thinking. There are some erratic persons whose views differ as much from Kant as they do from each other. Thus Mr. Mill says "Logic is the science of the operations of the understanding which are subservient to the estimation of evidence." Duval-Jouve says it is the science of the facts of the intellect, of its laws, and of the rules which serve to /regulate//guide/ its exercise. Krause says it treats of the law of the activity of the soul in thought. De Morgan says it is that "branch of inquiry in which the act of the mind in reasoning is considered."

All such statements as these last are worse than erroneous, in the extreme. Logic has nothing at all to do with operations of the understanding, acts of the mind, or facts of the intellect. This has been repeatedly shown by the Kantians. But I will go a step further and say that we ought to adopt a thoroughly unpsychological view of logic, and that we may do so without entirely overturning established ideas. For this purpose, suppose I write this syllogism on the board:

All conquerors are Butchers
Napoleon is a conqueror
∴ Napoleon is a butcher

Now this has a particular logical character to me as I write it; it has the same to all of you as you read it; it will have the same if you read it tomorrow; and while it remains on the board it will retain the same character to whoever can read it. Now is this logical character a form [165] of *thought* only? My thought when I wrote it was a different event from each one of your thoughts, and your thoughts will be each different if you read it again from what they were when you read it just now. The thoughts were many, but this form was one. For that which was written on the board remained the same. What is written, therefore, is the continual determinator of this form. Now a continual determinator of a form is that in which the form inheres by the definition of the relation of *substantia et accidens*. Hence, this logical character belongs to what is written on the board at least as much as to our thought. To this reasoning, there are at least three intelligent objections. The first is, that if this which is on the board were rubbed out and written again, the logical character would remain the same &c. So that the form would then adhere in the memory. I admit this objection and all its consequences; but it does not touch my point which was that the logical character does not belong to thought, *peculiarly*. The second objection is that though what is written has a logical character, it only has it because it can be understood and thought. This, also, I entirely admit. In the same way, those letters are white. There is no doubt the whiteness inheres in the chalk. Yet they are only white in so far and because they can be seen. There are ten words there -- that is to say ten conglomerations of writing. Yet there are ten only because by a mental process we distinguish ten objects. Indeed there is no form which could be unless the mind could think it. Form is as much determined by the *subject* or *I* as it is by the *object* or *IT*; but it is the *IT* which constitutes its matter and in fact matter may be defined as the /pure//sheer/ *IT* and the analogous word *substance* may be defined as the absolute *IT*. Hence the objection that this form is such only because it may be thought entirely fails of its object. The third objection is that by a form of thought is meant a form of thought in general not of this or that particular thought; and that this thought in general is in fact the genus of thought, and hence an abstraction not capable of being thought in its generality. This objection, also, I very nearly agree to. That which I set out to prove was that the psychological character of the Kantian definition was not an essential character. There is no difference amounting to the slightest contradiction between the two views. The psychological view is that these forms are only realized in thought, and that language is essential to thought. The

unpsychological view is that they are forms of all symbols whether internal or external, but that they only are by virtue of possible thought. In short, I say that the logical form |166| is already realized in the symbol itself; the psychologists say that it is only realized when the symbol is understood.

If the two views are so nearly alike why should the new one be pressed? What are its advantages? I answer that it has three. 1st It is philosophically more perfect. A definition of a science should not preclude conceptions foreign to that science. For instance, according to the generally received view space is the form of the external sense. If this be true, it would not be false to call geometry the science of the formal laws of the external sense. It would, however, be bad as a definition, because geometry regards extension simply as an object without any reference to its psychological or ontological character whatsoever. In the same way logic needs no distinction between the symbol and the thought; for every thought is a symbol, and the laws of logic are true of all symbols.

2. The second advantage of the unpsychological view is that it affords a most convenient means for exploding false notions of the subject. Take for example, Mr. Mill's definition of logic: "It is the science of the operations of the understanding which are subservient to the estimation of evidence." The psychological character of this is essential. This shows that the view is not merely false but wholly false. Accordingly, it is no exaggeration to say that Mr. Mill's logic is no more like what has been understood by that term than is Locke's *Essay Concerning Human Understanding*. **Again**, in almost all logics the subject of fallacies has occupied a prominent place. It has been supposed that the laws of logic might be broken. That they say "Thou ought" not "thou shalt," that in short they are statements not of *fact* but of *debt*. But what page of man's ledger does this "ought" refer to? Thought *debtor* to what? It is impossible to say. But why ought we to be logical? Because we wish our thoughts to be representations or symbols of fact. It is evident therefore that logic applies to the thought only in so far as the latter is a symbol. It is to symbols, therefore, that it primarily applies. Now by recognizing this fact it becomes plain at once that the objects of these laws cannot but comply with the laws; and hence that the whole idea of their being "normative" laws is false. **Again** the Kantians have one and all assumed that since the laws of logic are laws of thought, they do not apply to that which cannot be thought. Hence some make out that there is some thing of which it is not true that **A is not not-A**. Now the unpsychological view makes that systematically evident, which it would seem were otherwise sufficiently axiomatic, |167| that these laws apply not merely to what can be thought but to whatever can be symbolized in any way. And hence extends their validity to all subjects of argumentation whatever.

The third advantage of the unpsychological view is that it points to a direct and secure manner of investigating the subject. The psychologists are continually asking do we think thus and so or not, and they find this a very difficult question to answer because these thoughts which they speak of, if not fictitious, are, at least, not in the mind in that unmixed state in which they talk of them. But if the view I have taken is correct, these forms may just as well be studied in the sensible representation as the

mental. The psychologists are very apt to fall into notions which are only compatible with regarding logical truths as derived empirically from the observation of the mind. But this is not in accord with their own system. To make this clear, let us refer for a moment to metaphysics. The inner and the outer worlds as represented in common opinion and even sometimes by philosophers are two completely separate experiences, as distinct as two chambers; but this representation is a metaphysical fiction. Nothing is more common than for the philosophizing intellect in attempting to state clearly some view of the natural common-sense, to fall into a great error; and then this clear but false view displacing the true but undefined one produces a popular error. But having once eat of the tree of knowledge, there is no remedy but to eat more. We first draw a distinction and draw it badly; then the only way is to push on our analysis and draw it well. In the present instance it becomes important to distinguish two kinds of self-knowledge -- two selves, if you please, one known immediately and the other mediately. The mediate knowledge of self is not the inner world with which we are at present concerned, is not something presented to us but is a mere product of active thought. We find that every judgment is subject to a condition of consistency; its elements must be capable of being brought to a unity. This consistent unity since it belongs to all our judgments may be said to belong to us. Or rather since it belongs to the judgments of all mankind, we may be said to belong to it. But the world of self, the world of the feelings does not contain such a unity. Much rather does this unity contain the feelings. The world of feelings then is not a world of self but of instances of self. We know our feelings immediately; we also know what is before us in space immediately. But nevertheless we do not distinguish what is within from what is without immediately; for this distinction implies an act of [168] comparison the product of which requires to be known before we can judge that the inner is not the outer. But however this may be, whether this judgment is immediate or not; one thing will be admitted namely that the representation of the distinction between the two is a judgment. Furthermore it is a judgment which involves abstraction. Under all circumstances we have outward and inward feelings at once; that is to say we have a mixed feeling. We cannot then separate this feeling into two parts one of which is in space and the other not. For the feeling is all connected with space if any of it is. We can separate the relations of its parts according as they are of space or not. But surely all relations not of space as for instance that of light and darkz are not inward relations. No; the inward world must have a positive definition. Now every thing within is known by memory except the mere point of present consciousness. But unless we could compare our consciousness by memory we could attain no consciousness of ourselves. An immediate knowledge of the pas3t is contradictory in the same sense in which an immediate knowledge of the distant is. In both cases some machinery is requisite for bringing them into the present. The past of which we have an immediate knowledge is a remembered past, but memory is a mere mechanical faculty without any feeling or active consciousness. And when we say knowledge is immediate we do not mean to exclude mechanical media. The inward world is then the world of memory for it is clear that we can remember nothing except what is within. But the world of *memory* is the world of time; hence the inward world and the world of time are the same. Taking it for granted, then, that the inner and outer worlds are superposed throughout, without

possibility of separation, let us now proceed to another point. There is a third world, besides the inner and the outer; and all three are coextensive and contain every experience. Suppose that we have an experience. That experience has three determinations -- three different references to a substratum or substrata, lying behind it and determining it. In the first place, it is a determination of an object external to ourselves -- we feel that it is so because it is extended in space. Thereby it is in the external world. In the second place, it is a determination of our own soul, it is *our* experience; we feel that it is so because it lasts in time. Were it a flash of sensation, there for less than an instant, and then utterly gone from memory, we should not have time to think it ours. But while it lasts, and we reflect upon it, it enters into the internal world. We have now considered that experience as a determination of the modifying |169| object and of the modified soul; now, I say, it may be and is naturally regarded as also a determination of an Idea of the Universal mind; a pre-existent, archetypal Idea. Arithmetic, the law of number, *was* before anything to be numbered or any mind to number had been created. It *was* though it did not *exist*. It was not *a fact* nor a thought, but it was an unuttered word. *En archêi ên ho logos*. We feel an experience to be a determination of such an archetypal Logos, by virtue of its //*depth of tone*// logical intension// and thereby it is in the *logical world*.

Note the great difference between this view and Hegel's. Hegel says, logic is the science of the pure idea. I should describe it as the science of the laws of experience in virtue of its being a determination of the idea, or in other words as the formal science of the logical world.

In this point of view, efforts to ascertain precisely how the intellect works in thinking -- that is to say, investigation of internal characteristics -- is no more to the purpose which logical writers as such, however vaguely have in view, than would be the investigation of external characteristics.

Some reasons having now been given for adopting the unpsychological conception of the science, let us now seek to make this conception sufficiently distinct to serve for a definition of logic. For this purpose we must bring our *logos* from the abstract to the concrete, from the absolute to the dependent. There is no science of absolutes. The metaphysical logos is no more to us than the metaphysical soul or the metaphysical matter. To the absolute Idea or Logos, the dependent or relative *word* corresponds. The word *horse*, is thought of as being a word though it be unwritten, unsaid, and unthought. It is true, it must be considered as having been thought; but it need not have been thought by the same mind which regards it as being a word. I can think of a word in Feejee, though I can attach no definite articulation to it, and do not guess what it would be like. Such a word, abstract but not absolute, is no more than the genus of all symbols having the same meaning. We can also think of the higher genus which contains words of all meanings. A first approximation to a definition, then, will be that logic is the science of representations in general, whether mental or material. This definition coincides with Locke's. It is however too wide for logic does not treat of all kinds of representations. The resemblance of a

portrait to its object, for example, is not logical truth. It is necessary, therefore, to divide the genus representation according to the different ways in which it may accord with its object. The first and [170] simplest kind of truth is the resemblance of a copy. It may be roughly stated to consist in a sameness of predicates. Leibniz would say that carried to its highest point, it would destroy itself by becoming identity. Whether that is true or not, all known resemblance has a limit. Hence, resemblance is always partial truth. On the other hand, no two things are so different as to resemble each other in no particular. Such a case is supposed in the proverb that Dreams go by contraries -- an absurd notion, since concretes have no contraries. A false copy is one which claims to resemble an object which it does not resemble. But this never fully occurs, for two reasons; in the first place, the falsehood does not lie in the copy itself but in the *claim* which is made for it, in the *superscription* for instance; in the second place, as there must be *some* resemblance between the copy and its object, this falsehood cannot be entire. Hence, there is no absolute truth or falsehood of copies. Now logical representations have absolute truth and falsehood as we know *a posteriori* from the law of excluded middle. Hence, logic does not treat of copies.

The second kind of truth, is the denotation of a sign, according to a previous convention. A child's name, for example, by a convention made at baptism, denotes that person. Signs may be plural but they cannot have genuine generality because each of the objects to which they refer must have been fixed upon by convention. It is true that we may agree that a certain sign shall denote a certain individual conception an individual act of an individual mind, -- and that conception may stand for all conceptions resembling it; but in this case, the generality belongs to the *conception* and not to the sign. Signs, therefore, in this narrow sense are not treated of in logic, because logic deals only with general terms. The third kind of truth or accordance of a representation with its object, is that which inheres in the very nature of the representation whether that nature be original or acquired. Such a representation I name a *symbol*. To clear up the vagueness of this statement let us consider for an instant, our words. Every human word was once the sign of an individual conception, -- a sign in the narrow sense. But does it always retain this character? On this point I will read a few paragraphs from Locke.

**§4. Words often secretly referred,
First, to the Ideas in other men's minds.**

But though words as they are used by men, can properly and immediately signify nothing but the *ideas* that are in the mind of the speaker; yet they in their thoughts give them a secret reference to two other things. [171]

First, They suppose their words to be marks of the ideas in the minds also of other men with whom they communicate: for else they should talk in vain, and could not be understood if the sounds they applied to one *idea* where such as by the hearer were applied to another; which is to speak two languages. But in this

men stand not usually to examine whether the *idea* they and those they discourse with have in their minds, be the same: but think it enough that they use the word, as they imagine, in the common acceptation of that language; in which they suppose, that the *idea* they make it a sign of, is precisely the same, to which the understanding men of that country apply that name.

§5. *Secondly, to the reality of things*

Secondly, Because *men* would not be thought to talk *barely* of their own imagination, but of things as really they are; therefore they *often suppose the words to stand also for the reality of things*. But this relating more particularly to substances, and their names, as perhaps the former [i.e. the first "secret reference" does to simple *ideas* and modes, we shall speak of these two different ways of applying words more at large, when we come to treat of the names of mixed modes, and substances in particular: Though give me leave here to say, that it is a perverting the use of words, and brings unavoidable obscurity and confusion into their signification, whenever we make them stand for any thing, but those *ideas* we have in our own minds.

§6. *Words by use readily excite Ideas*

Concerning words also it is farther to be considered, *First*, That they being immediately the signs of men's *ideas*, and by that means the instruments whereby men communicate their conceptions, and express to one another those thoughts and imaginations they have within their own breasts; *there comes by constant use to be such a connexion between certain sounds and the ideas they stand for*, that the names heard, almost as readily excite certain *ideas*, as if the objects themselves, which are apt to produce them, did actually affect the senses. Which is manifestly so in all obvious sensible qualities; and in all substances, that frequently and familiarly occur to us.

§7. *Words often used without signification*

Secondly, That though the proper and immediate signification of words are *ideas* in the mind of the speaker, yet because by familiar use from our cradles we come to learn certain articulate sounds very perfectly, and have them readily on our tongues, and always at hand in our memories, but yet are not always careful to examine, or settle their significations perfectly; it *often* happens that *men*, even when they would apply themselves to an attentive consideration, *do set their thoughts more on words than things*. Nay, because words are many of them learned before the *ideas* are known for which they stand; therefore some, not only children, but men, speak several words no otherwise than parrots do, only because they have learned them, and have been accustomed to those sounds. But so far as words are of use and signification, so far is there a constant connexion between the sound [172] and the *idea*, and a designation that the one stands for the other;

without which application of them, they are nothing but so much insignificant noise. (Book iii, Ch.2, §§4.5.6.7)

I have adduced Locke, as a good authority on questions of fact. His critic, however, is wholly inadequate and false. It is enough to state this, because it is now a thing of the past. He here states the natural conceptions of the Human mind. He thinks them illusions; I shall accept them as valid. I ask you therefore to attend to his facts and to consider my interpretation of them. His first fact is that “a word as it is used by a man can immediately signify nothing but the idea that is in the mind of the speaker.” This is true; but we are not now dealing with words in their use, but with *words in themselves*. Upon this latter point he makes two observations. “First that men suppose their words to be marks of ideas in other men’s minds.” This opinion that the individuality of the mind which has the idea corresponding to a word is of no account, shows that the idea is regarded as belonging to mind in general, to the universal mind, and that words are considered, however obscurely, as determinations of the pure idea. “Secondly, men suppose their words to stand for the reality of things.” That is, they regard that intelligible form of the word, wherein its agreement with the conception and with the fact consists, to be also a form of the fact and not merely of the conception; this agreement of form constituting, in short, the *truth* of both word and conception. These two observations of Locke repose on the truth that the representative character of a word is naturally expressed in two ways, first as determined by the idea of the universal mind and second as determined by the abstract form of a possible object; this idea and this pure form being one and the same. Locke now makes two other observations which bear more precisely upon my expression of “symbolization by nature.” “Concerning words also it is farther to be considered,” he says, “that there comes by constant use to be such a connection between certain sounds and the ideas they stand for, that the names heard, almost as readily excite certain ideas as if the objects themselves, which are apt to produce them, did actually affect the senses.” Now this readiness of excitation obviously consists in this; namely, that we do not have to reflect upon the word as a sign but that it comes to affect the intellect as though it had that quality which it connotes. I call this the acquired nature of the word, because it is a power that the word comes to have, and because the word itself without any reflection of ours upon it brings the idea into [173] our minds. “Secondly,” says Locke, “it often happens that men even when they would apply themselves to attentive consideration do set their thoughts more on words than things.” It would be no wonder if men fell into error when they think of mere marks or sounds having nothing in common with the object of discussion. The wonder would be how they ever could advance one step. And yet in all //analytical/abstract// thought, not only do men more often think of words than things, but I venture to say they seldom think of the things at all, except in reference to their geometry owing to space being more easily thought than the words. How often do we think of the thing in algebra? When we use the symbol of multiplication we do not even think out the conception of multiplication, we think merely of the laws of that symbol, which coincide with the laws of the conception, and what is more to the purpose, coincide with the laws of multiplication in the object. Now, I

ask, how is it that anything can be done with a symbol, without reflecting upon the conception, much less imagining the object that belongs to it? It is simply because the symbol has acquired a nature, which may be described thus, that when it is brought before the mind certain principles of its use -- whether reflected on or not -- by association immediately regulate the action of the mind; and these may be regarded as laws of the symbol itself which it cannot *as a symbol* transgress.

I may mention in passing that if the symbol's nature is original it is more like a copy and that instances of such symbols are hieroglyphs, geometrical symbols, emblems, parables, etc., as well as conceptions or mental symbols. On the other hand if the symbolic nature is acquired the symbol is more like a sign as ordinary letters, language, and algebraical symbols. Locke says that the use of words in this symbolical way is attended with danger of ambiguity and that the only safety lies in using them as signs of recognized conceptions. That may be. But I believe it is demonstrable that attempts to define words, in the sense of determining the conceptions which correspond to them, are attended with some peculiar dangers. It is true, that the essence of philosophy is definition; but it is a trite remark that there is danger of error in philosophizing. It is substituting complex machinery for simple, artificial machinery for simple; it is walking on stilts. It is true that this machinery however dangerous is indispensable. Still I believe that there is a far better way of acquiring the *use* of our words; namely, the way in which we acquire the use of our arms, by exercise, by *selected* |174| *exercise*. And even for communicating the use of words, what can be more perfect than the method of examples?

But not to follow this subject too far, we have now established three species of representations; *copies*, *signs*, and *symbols*; of the last of which only logic treats. A second approximation to a definition of it then will be, the science of symbols in general and as such. But this definition is still too broad; this might, indeed, form the definition of a certain science which would be a branch of Semiotic or the general science of representations which might be called Symbolistic, and of this logic would be a species. But logic only considers symbols from a particular point of view.

A symbol in general and as such has three relations. The first is its relation to the pure Idea or Logos and this (from the analogy of the grammatical terms for the pronouns I, IT, THOU) I call its relation of the first person, since it is its relation to its own essence. The second is its relation to the Consciousness as being thinkable, or to any language as being translatable, which I call its relation to the second person, since it refers to its power of appealing to a mind. The third is its relation to its object, which I call its relation to the third person or IT. Every symbol is subject to three distinct systems of formal law as conditions of its taking up these three relations. If it violates either one of these three codes, the condition of its having either of the three relations, it ceases to be a symbol and makes *nonsense*. Nonsense is that which has a certain resemblance to a symbol without being a symbol. But since it simulates the symbolic character it is usually only one of the three codes which it violates; at any rate, flagrantly. Hence there should be at least three different kinds of nonsense. And accordingly we remark that we call nonsense

meaningless, absurd, or quibbling, in different cases. If a symbol violates the conditions of its being a determination of the pure Idea or logos, it may be so nearly a determination thereof as to be perfectly intelligible. If for instance instead of *I am* one should say *I is*. *I is* is in itself meaningless, it violates the conditions of its relation to the form it is meant to embody. Thus we see that the conditions of the relation of the first person are the laws of grammar.

I will now take another example. I know my opinion is false, still I hold it. This is grammatical, but the difficulty is that it violates the conditions of its having an object. Observe that this is precisely the difficulty. It not only cannot be a determination of this or that object, but it cannot be a determination of any object, whatever. This is the whole difficulty. I say that, I receive contradictories into one opinion [175] or symbolical representation; now this implies that it is a symbol of nothing. Here is another example: This very proposition is false. This is a proposition to which the law of excluded middle namely that every symbol must be false or true, does not apply. For if it is false it is thereby true. And if not false it is thereby not true. Now why does not this law apply to this proposition? Simply because it does itself state that it has no object. It talks of itself and only of itself and has no external relations whatever. These examples show that logical laws only hold good as conditions of a symbol's having an object. The fact that it has often been called the science of truth confirms this view.

I define logic therefore as the science of the conditions which enable symbols in general to refer to objects.

At the same time *symbolistic* in general gives a trivium consisting of Universal Grammar, Logic, and Universal Rhetoric, using this last term to signify the science of the formal conditions of intelligibility of symbols.

In the next lecture I shall give the general theory of induction.

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