Questions Concerning Certain Faculties Claimed for Man

P 26: Journal of Speculative Philosophy 2 (1868): 103-14. (Also published in W2:193-211 (with related letters and earlier attempts at this article and the two that follow) and in CP 5:213-63.) Item 2 is the first of three articles usually referred to as the JSP Cognition Series, in which Peirce develops some of the results and consequences of item 1 and attempts "to prove and to trace the consequences of certain propositions in epistemology tending toward the recognition of the reality of contingency and of generality and going to show the absurdity of individualism and of egoism." (In "The Law of Mind" [item 23], it is indicated that this is an early attempt at developing his doctrine of syncraticism.) Peirce's opposition to Cartesianism results in the following four denials: (1) we have no power of introspection, but all knowledge of the internal world is derived by hypothetical reasoning from our knowledge of external facts, (2) we have no power of intuition, but every cognition is determined logically by previous cognitions, (3) we have no power of thinking without signs, and (4) we have no conception of the absolutely incognizable.

Question 1. Whether by the simple contemplation of a cognition, independently of any previous knowledge and without reasoning from signs, we are enabled rightly to judge whether that cognition has been determined by a previous cognition or whether it refers immediately to its object.

Throughout this paper, the term "intuition" will be taken as signifying a cognition not determined by a previous cognition of the same object, and therefore so determined by something out of the consciousness. Let me request the reader to note this. Intuition here will be

*The word *intuitus* first occurs as a technical term in St. Anselm's *Monologium*. He wished to distinguish between our knowledge of God and our knowledge of finite things (and, in the next world, of God, also); and thinking of the saying of St. Paul, *Videntes non per speculum in asynam: tunc autem facie ad faciun*, he called the former speculation and the latter intuition. This use of "speculation" did not take root, because that word was already in use to indicate a possibly structured thought that, if not entirely cogitate content, does not display the same. But how does this square of its ego is taken in for thinking? We have no direct cop of thinking, so we say against the intuition, but we can consider the imagination as a necessary component of every experience, and so that seems to be an error, in general. A full-scale analysis of a given or seen, we see, is not an intuition (i.e., not non-epistemological) all...
nearly the same as "premise not itself a conclusion"; the only difference being that premises and conclusions are judgments, whereas an intuition may, as far as its definition states, be any kind of cognition whatever. But just as a conclusion (good or bad) is determined in the mind of the reasoner by its premise, so cognitions not judgments may be determined by previous cognitions; and a cognition not so determined, and therefore determined directly by the transcendental object, is to be termed an intuition.

Now, it is plainly one thing to have an intuition and another to know intuitively that it is an intuition, and the question is whether these two things, distinguishable in thought, are, in fact, invariably connected, so that we can always intuitively distinguish between an intuition and a cognition determined by another. Every cognition, as something present, is, of course, an intuition of itself. But the determination of a cognition by another cognition or by a transcendental object is not, at least so far as appears obviously at first, a part of the immediate content of that cognition, although it would appear to be an element of the action or passion of the transcendental ego, which is not, perhaps, in consciousness immediately; and yet this transcendental action or passion may invariably determine a cognition of itself, so that, in fact, the determination or non-determination of the cognition by another may be a part of the cognition. In this case, I should say that we had an intuitive power of distinguishing an intuition from another cognition.

There is no evidence that we have this faculty, except that we seem to feel that we have it. But the weight of that testimony depends entirely on our being supposed to have the power of distinguishing in this feeling whether the feeling be the result of education, old associations, etc., or whether it is an intuitive cognition; or, in other words, it depends on presupposing the very matter testified to. Is this feeling infallible? And is this judgment concerning it infallible and so on, ad infinitum? Supposing that a man really could shut himself up in such a faith, he would, of course, impervious to the truth, "evidence-proof."

But let us compare the theory with the historic facts. The power

*The proposition of Berengarius is contained in the following quotation from his De Sacra Coena: "Maximi plane cordis est, per omnia ad dialecticum confuger, quia confuger ad eam ad rationem est confuger, quia non confuger, cum secundum rationem sit factus ad imaginem dei, nam humanae sui rerum ut mors ad imaginem dei."

The most striking characteristic of medieval reasoning, in general, is the perpetual resort to authority. When Fredexigus and others wish to prove that darkness is a thing, although they have evidently derived the opinion from nominalistic-Platonic meditations, they argue the matter thus: "God called the darkness, night"; then, certainly, it is a thing, for otherwise before it had a name, there would have been nothing, not even a fiction to name. Abelard thinks it worth while to cite Boethius, when he says that space has three dimensions, and when he says that an individual cannot be in two places at once. The author of De Generebus et Speciebus, a work of a superior order, in arguing against a Platonic doctrine, says that if whatever is universal is eternal, the form and matter of Socrates, being severally universal, are both eternal, and that, therefore, Socrates was not created by God, but only put together, "quod quantum a vero esse, palam est." The authority is the final court of appeal. The same author, where in one place he doubts a statement of Boethius, finds it necessary to assign a special reason why in this case it is not absurd to do so. Except probo regulam in casibus non exceptis. Recognized authorities were certainly sometimes disputed in the twelfth century; their mutual contradictions insured that; and the authority of philosophers was regarded as inferior to that of theologians. Still, it would be impossible to find a passage where the authority of Aristotle is directly denied upon any logical question. "Sunt et multi errores eius," says John of Salisbury, "qui in scripturis tam Euthenici, quam fidelius potuerunt inveneri: verum in logicae parem babuisse non legitur." "Sed nihil adversus Aristotelense," says Abelard, and in another place, "Sed si Aristotelense Peripateitarum principem culpere possumus, quam amplius in hac arte receperim?" The idea of going without an authority, or of subordinating authority to reason, does not occur to him.
particularly noticeable in the case of a person who is describing the performances of a spiritual medium or of a professed juggler. The difficulty is so great that the juggler himself is often astonished at the discrepancy between the actual facts and the statement of an intelligent witness who has not understood the trick. A part of the very complicated trick of the Chinese rings consists in taking two solid rings linked together, talking about them as though they were separate—taking it for granted, as it were—then pretending to put them together, and handing them immediately to the spectator that he may see that they are solid. The art of this consists in raising, at first, the strong suspicion that one is broken. I have seen McAlister do this with such success, that a person sitting close to him, with all his faculties straining to detect the illusion, would have been ready to swear that he saw the rings put together, and, perhaps, if the juggler had not professedly practised deception, would have considered a doubt of it as a doubt of his own veracity. This certainly seems to show that it is not always very easy to distinguish between a premise and a conclusion, that we have no infallible power of doing so, and that in fact our only security in difficult cases is in some signs from which we can infer that a given fact must have been seen or must have been inferred. In trying to give an account of a dream, every accurate person must often have felt that it was a hopeless undertaking to attempt to disentangle waking interpretations and fillings out from the fragmentary images of the dream itself.

The mention of dreams suggests another argument. A dream, as far as its own content goes, is exactly like an actual experience. It is mistaken for one. And yet all the world believes that dreams are determined, according to the laws of the association of ideas, &c., by previous cognitions. If be it said that the faculty of intuitively recognizing intuitions is asleep, I reply that this is a mere supposition, without other support. Besides, even when we wake up, we do not find that the dream differed from reality, except by certain marks, darkness and fragmentariness. Not unfrequently a dream is so vivid that the memory of it is mistaken for the memory of an actual occurrence.

A child has, as far as we know, all the perceptive powers of a man. Yet question him a little as to how he knows what he does. In many cases, he will tell you that he never learned his mother-tongue; he always knew it, or he knew it as soon as he came to have sense. It appears, then, that be does not possess the faculty of distinguishing, by simple contemplation, between an intuition and a cognition determined by others.

There can be no doubt that before the publication of Berkeley's book on Vision, 7 it had generally been believed that the third dimension of space was immediately intuited, although, at present, nearly all admit that it is known by inference. We had been contemplating the object since the very creation of man, but this discovery was not made until we began to reason about it.

Does the reader know of the blind spot on the retina? Take a number of this journal, turn over the cover so as to expose the white paper, lay it sideways upon the table before which you must sit, and put two cents upon it, one near the left-hand edge, and the other to the right. Put your left hand over your left eye, and with the right eye look steadily at the left-hand cent. Then, with your right hand, move the right-hand cent (which is now plainly seen) towards the left hand. When it comes to a place near the middle of the page it will disappear—you cannot see it without turning your eye. Bring it nearer to the other cent, or carry it further away, and it will reappear; but at that particular spot it cannot be seen. Thus it appears that there is a blind spot nearly in the middle of the retina; and this is confirmed by anatomy. It follows that the space we immediately see (when one eye is closed) is not, as we had imagined, a continuous oval, but is a ring, the filling up of which must be the work of the intellect. What more striking example could be desired of the impossibility of distinguishing intellectual results from intuitive data, by mere contemplation?

A man can distinguish different textures of cloth by feeling; but not immediately, for he requires to move his fingers over the cloth, which shows that he is obliged to compare the sensations of one instant with those of another.

The pitch of a tone depends upon the rapidity of the succession of the vibrations which reach the ear. Each of those vibrations produces an impulse upon the ear. Let a single such impulse be made upon the ear, and we know, experimentally, that it is perceived. There is, therefore, good reason to believe that each of the impulses forming a tone is perceived. Nor is there any reason to the contrary. So that this is the only admissible supposition. Therefore, the pitch of a tone depends upon the rapidity with which certain impressions are successively conveyed to the mind. These impressions must exist previously to any tone; hence, the sensation of pitch is determined by previous cognitions. Nevertheless, this would never have been discovered by the mere contemplation of that feeling.

A similar argument may be urged in reference to the perception of two dimensions of space. This appears to be an immediate intuition. But if we were to see immediately an extended surface, our retinas must be spread out in an extended surface. Instead of that, the retina consists of innumerable needles pointing towards the light, and whose distances from one another are decidedly greater than the minimum visible. 10 Suppose each of those nerve-points conveys the sensation of a little colored surface. Still, what we immediately see must even then be, not a continuous surface, but a collection of spots. Who could discover this by mere intuition? But all the analogies of the nervous
system are against the supposition that the excitation of a single nerve can produce an idea as complicated as that of a space, however small. If the excitation of no one of these nerve-points can immediately convey the impression of space, the excitation of all cannot do so. For, the excitation of each produces some impression (according to the analogies of the nervous system), hence, the sum of these impressions is a necessary condition of any perception produced by the excitation of all; or, in other terms, a perception produced by the excitation of all is determined by the mental impressions produced by the excitation of every one. This argument is confirmed by the fact that the existence of the perception of space can be fully accounted for by the action of faculties known to exist, without supposing it to be an immediate impression. For this purpose, we must bear in mind the following facts of physio-psychology: 1. The excitation of a nerve does not of itself inform us where the extremity of it is situated. If, by a surgical operation, certain nerves are displaced, our sensations from those nerves do not inform us of the displacement. 2. A single sensation does not inform us how many nerves or nerve-points are excited. 3. We can distinguish between the impressions produced by the excitations of different nerve-points. 4. The differences of impressions produced by different excitations of similar nerve-points are similar. Let a momentary image be made upon the retina. By No. 2, the impression thereby produced will be indistinguishable from what might be produced by the excitation of some conceivable single nerve. It is not conceivable that the momentary excitation of a single nerve should give the sensation of space. Therefore, the momentary excitation of all the nerve-points of the retina cannot, immediately or mediatly, produce the sensation of space. The same argument would apply to any unchanging image on the retina. Suppose, however, that the image moves over the retina. Then the peculiar excitation which at one instant affects one nerve-point, at a later instant will affect another. These will convey impressions which are very similar by 4, and yet which are distinguishable by 3. Hence, the conditions for the recognition of a relation between these impressions are present. There being, however, a very great number of nerve-points affected by a very great number of successive excitations, the relations of the resulting impressions will be almost inconceivably complicated. Now, it is a known law of mind, that when phenomena of an extreme complexity are presented, which yet would be reduced to order or mediate simplicity by the application of a certain conception, that conception sooner or later arises in application to those phenomena. In the case under consideration, the conception of extension would reduce the phenomena to unity, and, therefore, its genesis is fully accounted for. It remains only to explain why the previous cognitions which determine it are not more clearly apprehended. For this explanation, I shall refer to a paper upon a new list of categories, §5, merely adding that just as we are able to recognize our friends by certain appearances, although we cannot possibly say what those appearances are and are quite unconscious of any process of reasoning, so in any case when the reasoning is easy and natural to us, however complex may be the premises, they sink into insignificance and oblivion proportionately to the satisfactoriness of the theory based upon them. This theory of space is confirmed by the circumstance that an exactly similar theory is imperatively demanded by the facts in reference to time. That the course of time should be immediately felt is obviously impossible. For, in that case, there must be an element of this feeling at each instant. But in an instant there is no duration and hence no immediate feeling of duration. Hence, no one of these elementary feelings is an immediate feeling of duration; and, hence the sum of all is not. On the other hand, the impressions of any moment are very complicated,—containing all the images (or the elements of the images) of sense and memory, which complexity is reducible to mediate simplicity by means of the conception of time.†

†Proceedings of the American Academy, May 14, 1867. [Item 1 above, pp. 1-10.]

‡The above theory of space and time does not conflict with that of Kant so much as it appears to do. They are in fact the solutions of different questions. Kant, it is true, makes space and time abstractions, or rather forms of intuition, but it is not essential to his theory that intuition should mean more than "individually represented." The apprehension of space and time results, according to him, from a mental process,—the "Synthesis of the Apprehension in the Anschauung." (See Kritik der reinen Vernunft. Ed. 1781, pp. 98 et seq.) My theory is merely an account of this synthesis.

The gist of Kant's "Transcendental Aesthetic" is contained in two principles. First, that universal and necessary propositions are not given in experience. Second, that universal and necessary facts are determined by the conditions of experience in general. By a universal proposition is meant merely, one which asserts something of all of a sphere,—not necessarily one which all men believe. By a necessary proposition, is meant one which asserts what it does, not merely of the actual condition of things, but of every possible state of things; it is not meant that the proposition is one which we cannot help believing. Experience, in Kant's first principle, cannot be used for a product of the objective understanding, but must be taken for the first impressions of sense with consciousness conjoined and worked up by the imagination into images, with all which is logically deducible therefrom. In this sense, it may be admitted that universal and necessary propositions are not given in experience. But, in that case, neither are any inductive conclusions which might be drawn from experience, given in it. In fact, it is the peculiar function of induction to produce universal and necessary propositions. Kant points out, indeed, that the universality and necessity of scientific inductions are but the analogues of philosophic universality and necessity; and this is true, in so far as it is never allowable to accept a scientific conclusion without a certain indefinite drawback. But this is owing, to the insufficiency in the number of the instances; and whenever instances may be had in as large numbers as we please, ad infinitum, a truly universal and necessary proposition is inferable. As for Kant's second principle, that the truth of universal and necessary propositions is dependent upon the conditions of the general experience, it is no more nor less than the principle of Induction. I go to a fair and draw from the "purse" twelve packages. Upon opening them, I find that every one contains a red ball. Hence it is a universal fact. It depends, then, on the condition of the experience. What is the condition of the experience? It is solely that the balls are the contents of packages drawn from that bag, that is, the only thing which determined the experience, was the drawing from the bag. I infer, then, according to the principle
We have, therefore, a variety of facts, all of which are most readily explained on the supposition that we have no intuitive faculty of distinguishing intuitive from mediate cognitions. Some arbitrary hypothesis may otherwise explain any one of these facts; this is the only theory which brings them to support one another. Moreover, no facts require the supposition of the faculty in question. Whoever has studied the nature of proof will see, then, that there are here very strong reasons for disbelieving the existence of this faculty. These will become still stronger when the consequences of rejecting it have, in this paper and in a following one, been more fully traced out.

**Question 2. Whether we have an intuitive self-consciousness.**

Self-consciousness, as the term is here used, is to be distinguished both from consciousness generally, from the internal sense, and from pure apperception. Any cognition is a consciousness of the object as represented; by self-consciousness is meant a knowledge of ourselves. Not a mere feeling of subjective conditions of consciousness, but of our personal selves. Pure apperception is the self-assertion of the ego; the self-consciousness here meant is the recognition of my private self. I know that I (not merely the I) exist. The question is, how do I know it; by a special intuitive faculty, or is it determined by previous cognitions?

Now, it is not self-evident that we have such an intuitive faculty, for it has just been shown that we have no intuitive power of distinguishing an intuition from a cognition determined by others. Therefore, the existence or non-existence of this power is to be determined upon evidence, and the question is whether self-consciousness can be explained by the action of known faculties under conditions known to exist, or whether it is necessary to suppose an unknown cause for this cognition, and, in the latter case, whether an intuitive faculty of self-consciousness is the most probable cause which can be supposed.

It is first to be observed that there is no known self-consciousness to be accounted for in extremely young children. It has already been pointed out by Kant* that the late use of the very common word "I" with children indicates an imperfect self-consciousness in them, and that, therefore, so far as it is admissible for us to draw any conclusion of Kant, that what is drawn from the bag will contain a red ball. This is induction. Apply induction not to any limited experience but to all human experience and you have the Kantian philosophy, so far as it is correctly developed.

Kant's successors, however, have not been content with his doctrine. Nor ought they to have been. For, there is this third principle: "Absolutely universal propositions must be analytic." For whatever is absolutely universal is devoid of all content or determination, for all determination is by negation. The problem, therefore, is not how universal propositions can be synthetical, but how universal propositions appearing to be synthetical can be evolved by thought alone from the purely indeterminate.

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*Werk., vii (2), 9.
I may remark, by the way, that this remains so through life; testimony will convince a man that he himself is mad. A child hears it said that the stove is hot. But it is not, he says; and, indeed, that central body is not touching it, and only what that touches is hot or cold. But he touches it, and finds the testimony confirmed in a striking way. Thus, he becomes aware of ignorance, and it is necessary to suppose a self in which this ignorance can inhere. So testimony gives the first dawning of self-consciousness.

But, further, although usually appearances are either only confirmed or merely supplemented by testimony, yet there is a certain remarkable class of appearances which are continually contradicted by testimony. These are those predicates which we know to be emotional, but which be distinguishes by their connection with the movements of that central person, himself (that the table wants moving, etc.). These judgments are generally denied by others. Moreover, he has reason to think that others, also, have such judgments which are quite denied by all the rest. Thus, he adds to the conception of appearance as the actualization of fact, the conception of it as something private and valid only for one body. In short, error appears, and it can be explained only by supposing a self which is fallible.

Ignorance and error are all that distinguish our private selves from the absolute ego of pure apperception.

Now, the theory which, for the sake of perspicuity, has thus been stated in a specific form, may be summed up as follows: At the age at which we know children to be self-conscious, we know that they have been made aware of ignorance and error; and we know them to possess at that age powers of understanding sufficient to enable them then to infer from ignorance and error their own existence. Thus we find that known faculties, acting under conditions known to exist, would rise to self-consciousness. The only essential defect in this account of the matter is, that while we know that children exercise as much understanding as is here supposed, we do not know that they exercise it in precisely this way. Still the supposition that they do so is infinitely more supported by facts, than the supposition of a wholly peculiar faculty of the mind.

The only argument worth noticing for the existence of an intuitive self-consciousness is this. We are more certain of our own existence than of any other fact; a premise cannot determine a conclusion to be more certain than it is itself; hence, our own existence cannot have been inferred from any other fact. The first premise must be admitted, but the second premise is founded on an exploded theory of logic. A conclusion cannot be more certain than that some one of the facts which support it is true, but it may easily be more certain than any one of those facts. Let us suppose, for example, that a dozen witnesses testify to an occurrence. Then my belief in that occurrence rests on the belief that each of those men is generally to be believed upon oath. Yet the fact testified to is made more certain than that any one of those men is generally to be believed. In the same way, to the developed mind of man, his own existence is supported by every other fact, and is, therefore, incomparably more certain than any one of these facts. But it cannot be said to be more certain than that there is another fact, since there is no doubt perceptible in either case.

It is to be concluded, then, that there is no necessity of supposing an intuitive self-consciousness, since self-consciousness may easily be the result of inference.

Question 3. Whether we have an intuitive power of distinguishing between the subjective elements of different kinds of cognition.

Every cognition involves something represented, or that of which we are conscious, and some action or passion of the self whereby it becomes represented. The former shall be termed the objective, the latter the subjective, element of the cognition. The cognition itself is an intuition of its objective element, which may therefore be called, also, the immediate object. The subjective element is not necessarily immediately known, but it is possible that such an intuition of the subjective element of a cognition of its character, whether that of dreaming, imagining, conceiving, believing, etc., should accompany every cognition. The question is whether this is so.

It would appear, at first sight, that there is an overwhelming array of evidence in favor of the existence of such a power. The difference between seeing a color and imagining it is immense. There is a vast difference between the most vivid dream and reality. And if we had no intuitive power of distinguishing between what we believe and what we merely conceive, we never, it would seem, could in any way distinguish them; since if we did so by reasoning, the question would arise whether the argument itself was believed or conceived, and this must be answered before the conclusion could have any force. And thus there would be a regressus ad infinitum. Besides, if we do not know that we believe, then, from the nature of the case, we do not believe.

But be it noted that we do not intuitively know the existence of this faculty. For it is an intuitive one, and we cannot intuitively know that a cognition is intuitive. The question is, therefore, whether it is necessary to suppose the existence of this faculty, or whether the facts can be explained without this supposition.

In the first place, then, the difference between what is imagined or dreamed and what is actually experienced is no argument in favor of the existence of such a faculty. For it is not questioned that there are distinctions in what is present to the mind, but the question is, whether independently of any such distinctions in the immediate objects of consciousness, we have any immediate power of distinguishing different modes of consciousness.
difference in the immediate objects of sense and imagination, sufficiently accounts for our distinguishing those faculties; and instead of being an argument in favor of the existence of an intuitive power of distinguishing the subjective elements of consciousness, it is a powerful reply to any such argument, so far as the distinction of sense and imagination is concerned.

Passing to the distinction of belief and conception, we meet the statement that the knowledge of belief is essential to its existence. Now, we can unquestionably distinguish a belief from a conception, in most cases, by means of a peculiar feeling of conviction; and it is a mere question of words whether we define belief as that judgment which is accompanied by this feeling, or as that judgment from which a man will act. We may conveniently call the former rational, the latter active belief. That neither of these necessarily involves the other, will surely be admitted without any recital of facts. Taking belief in the rational sense, the intuitive power of reorganizing it will amount simply to the capacity for the sensation which accompanies the judgment. This sensation, like any other, is an object of consciousness; and therefore the capacity for it implies no intuitive recognition of subjective elements of consciousness. If belief is taken in the active sense, it may be discovered by the observation of external facts and by inference from the sensation of conviction which usually accompanies it.

Thus, the arguments in favor of this peculiarity of power of consciousness disappear, and the presumption is against such a hypothesis. Moreover, as the immediate objects of any two faculties must be admitted to be different, the facts do not render such a supposition in any degree necessary.

Question 4. Whether we have any power of introspection, or whether our whole knowledge of the internal world is derived from the observation of external facts.

It is not intended here to assume the reality of the external world. Only, there is a certain set of facts which are ordinarily regarded as external, while others are regarded as internal. The question is whether the latter are known otherwise than by inference from the former. By introspection, I mean a direct perception of the internal world, but not necessarily a perception of it as internal. Nor do I mean to limit the significance of the word to intuition, but would extend it to any knowledge of the internal world not derived from external observation.

There is one sense in which any perception has an internal object, namely, that every sensation is partly determined by internal conditions. Thus, the sensation of redness is as it is, owing to the constitution of the mind; and in this sense it is a sensation of something internal. Hence, we may derive a knowledge of the mind from a consideration of this sensation, but that knowledge would, in fact, be an inference from redness as a predicate of something external. On the other hand, there are certain other feelings—the emotions, for example—which appear to arise in the first place, not as predicates at all, and to be referable to the mind alone. It would seem, then, that by means of these, a knowledge of the mind may be obtained, which is not inferred from any character of outward things. The question is whether this is really so.

Although introspection is not necessarily intuitive, it is not self-evident that we possess this capacity; for we have no intuitive faculty of distinguishing different subjective modes of consciousness. The power, if it exists, must be known by the circumstance that the facts cannot be explained without it.

In reference to the above argument from the emotions, it must be admitted that if a man is angry, his anger implies, in general, no determinate and constant character in its object. But, on the other hand, it can hardly be questioned that there is some relative character in the outward thing which makes him angry, and a little reflection will serve to show that his anger consists in his saying to himself, "This thing is vile, abominable, etc.," and that it is rather a mark of returning reason to say, "I am angry." In the same way any emotion is a predication concerning some object, and the chief difference between this and an objective intellectual judgment is that while the latter is relative to human nature or to mind in general, the former is relative to the particular circumstances and disposition of a particular man at a particular time. What is here said of emotions in general, is true in particular of the sense of beauty and of the moral sense. Good and bad are feelings which first arise as predicates, and therefore are either predicates of the not-I, or are determined by previous cognitions (there being no intuitive power of distinguishing subjective elements of consciousness).

It remains, then, only to inquire whether it is necessary to suppose a particular power of introspection for the sake of accounting for the sense of willing. Now, volition, as distinguished from desire, is nothing but the power of concentrating the attention, of abstracting. Hence, the knowledge of the power of abstracting may be inferred from abstract objects, just as the knowledge of the power of seeing is inferred from colored objects.

It appears, therefore, that there is no reason for supposing a power of introspection; and, consequently, the only way of investigating a psychological question is by inference from external facts.

Question 5. Whether we can think without signs.

This is a familiar question, but there is, to this day, no better argument in the affirmative than that thought must precede every sign. This assumes the impossibility of an infinite series. But Achilles,
as a fact, will overtake the tortoise. How this happens, is a question not necessary to be answered at present, as long as it certainly does happen.

If we seek the light of external facts, the only cases of thought which we can find are of thought in signs. Plainly, no other thought can be evidenced by external facts. But we have seen that only by external facts can thought be known at all. The only thought, then, which can possibly be cognized is thought in signs. But thought which cannot be cognized does not exist. All thought, therefore, must necessarily be in signs.

A man says to himself, "Aristotle is a man; therefore, he is fallible." Has he not, then, thought what he has not said to himself, that all men are fallible? The answer is, that he has done so, so far as this is said in his therefore. According to this, our question does not relate to fact, but is a mere asking for distinctness of thought.

From the proposition that every thought is a sign, it follows that every thought must address itself to some other, must determine some other, since that is the essence of a sign. This, after all, is but another form of the familiar axiom, that in intuition, i.e., in the immediate present, there is no thought, or, that all which is reflected upon has past. Hinc loquor inde est. That, since any thought, there must have been a thought, has its analogue in the fact that, since any past time, there must have been an infinite series of times. To say, therefore, that thought cannot happen in an instant, but requires a time, is but another way of saying that every thought must be interpreted in another, or that all thought is in signs.

**Question 6. Whether a sign can have any meaning, if by its definition it is the sign of something absolutely incognizable.**

It would seem that it can, and that universal and hypothetical propositions are instances of it. Thus, the universal proposition, "all ruminants are cloven-hoofed," speaks of a possible infinity of animals, and no matter how many ruminants may have been examined, the possibility must remain that there are others which have not been examined. In the case of a hypothetical proposition, the same thing is still more manifest; for such a proposition speaks not merely of the actual state of things, but of every possible state of things, all of which are not knowable, inasmuch as only one can so much as exist.

On the other hand, all our conceptions are obtained by abstractions and combinations of cognitions first occurring in judgments of experience. Accordingly, there can be no conception of the absolutely incognizable, since nothing of that sort occurs in experience. But the meaning of a term is the conception which it conveys. Hence, a term can have no such meaning.

If it be said that the incognizable is a concept compounded of the concept not and cognizable, it may be replied that not is a mere syncategorematic term and not a concept by itself.

If I think "white," I will not go so far as Berkeley and say that I think of a person seeing, but I will say that what I think is of the nature of a cognition, and so of anything else which can be experienced. Consequently, the highest concept which can be reached by abstractions from judgments of experience—and therefore, the highest concept which can be reached at all—is the concept of something of the nature of a cognition. Not, therefore, or what is other than, if a concept, is a concept of the cognizable. Hence, not-cognizable, if a concept, is a concept of the form "A, not-A," and is, at least, self-contradictory. Thus, ignorance and error can only be conceived as correlative to a real knowledge and truth, which latter are of the nature of cognitions. Over against any cognition, there is an unknown but knowable reality; but over against all possible cognition, there is only the self-contradictory. In short, cognizability (in its widest sense) and being are not merely metaphysically the same, but are synonymous terms.

To the argument from universal and hypothetical propositions, the reply is, that though their truth cannot be cognized with absolute certainty, it may be probably known by induction.

**Question 7. Whether there is any cognition not determined by a previous cognition.**

It would seem that there is or has been; for since we are in possession of cognitions, which are all determined by previous ones, and these by cognitions earlier still, there must have been a first in this series or else our state of cognition at any time is completely determined, according to logical laws, by our state at any previous time. But there are many facts against the last supposition, and therefore in favor of intuitive cognitions.

On the other hand, since it is impossible to know intuitively that a given cognition is not determined by a previous one, the only way in which this can be known is by hypothetic inference from observed facts. But to adduce the cognition by which a given cognition has been determined is to explain the determinations of that cognition. And it is the only way of explaining them. For something entirely out of consciousness which may be supposed to determine it, can, as such, only be known and only adduced in the determinate cognition in question. So, that to suppose that a cognition is determined solely by something absolutely external, is to suppose its determinations incapable of explanation. Now, this is a hypothesis which is warranted under no circumstances, inasmuch as the only possible justification for a hypothesis is that it explains the facts, and to say that they are explained and at the same time to suppose them inexplicable is self-contradictory.
If it be objected that the peculiar character of red is not determined by any previous cognition, I reply that that character is not a character of red as a cognition; for if there be a man to whom red things look as blue ones do to me and \textit{vice versa}, that man's eyes teach him the same facts that they would if he were like me.

Moreover, we know of no power by which an intuition could be known. For, as the cognition is beginning, and therefore in a state of change, at only the first instant would it be intuition. And, therefore, the apprehension of it must take place in no time and be an event occupying no time.\footnote{This argument, however, only covers a part of the question. It does not go to show that there is no cognition undetermined except by another like it.} Besides, all the cognitive faculties we know of are relative, and consequently their products are relations. But the cognition of a relation is determined by previous cognitions. No cognition not determined by a previous cognition, then, can be known. It does not exist, then, first, because it is absolutely incognizable, and second, because a cognition only exists so far as it is known.

The reply to the argument that there must be a first is as follows: In retracing our way from conclusions to premises, or from determined cognitions to those which determine them, we finally reach, in all cases, a point beyond which the consciousness in the determined cognition is more lively than in the cognition which determines it. We have a less lively consciousness in the cognition which determines our cognition of the third dimension than in the latter cognition itself; a less lively consciousness in the cognition which determines our cognition of a continuous surface (without a blind spot) than in this latter cognition itself; and a less lively consciousness of the impressions which determine the sensation of tone than of that sensation itself. Indeed, when we get near enough to the external this is the universal rule. Now let any horizontal line represent a cognition, and let the length of the line serve to measure (so to speak) the liveliness of consciousness in that cognition. A point, having no length, will, on this principle, represent an object quite out of consciousness. Let one horizontal line below another represent a cognition which determines the cognition represented by that other and which has the same object as the latter. Let the finite distance between two such lines represent that they are two different cognitions. With this aid to thinking, let us see whether "there must be a first." Suppose an inverted triangle $\nabla$ to be gradually dipped into water. At any date or instant, the surface of the water makes a horizontal line across that triangle. This line represents a cognition. At a subsequent date, there is a sectional line so made, higher upon the triangle. This represents another cognition of the same object determined by the former, and having a livelier consciousness. The apex of the triangle represents the object external to the mind which determines both these cognitions. The state of the triangle before it reaches the water, represents a state of cognition which contains nothing which determines these subsequent cognitions. To say, then, that if there be a state of cognition by which all subsequent cognitions of a certain object are not determined, there must subsequently be some cognition of that object not determined by previous cognitions of the same object, is to say that when that triangle is dipped into the water there must be a sectional line made by the surface of the water lower than which no surface line had been made in that way. But draw the horizontal line where you will, as many horizontal lines as you please can be assigned at finite distances below it and below one another. For any such section is at some distance above the apex, otherwise it is not a line. Let this distance be $a$. Then there have been similar sections at the distances $\frac{1}{3}a$, $\frac{1}{4}a$, $\frac{1}{5}a$, $\frac{1}{6}a$, above the apex, and so on as far as you please. So that it is not true that there must be a first. Explicate the logical difficulties of this paradox (they are identical with those of the Achilles) in whatever way you may. I am content with the result, as long as your principles are fully applied to the particular case of cognitions determining one another. Deny motion, if it seems proper to do so; only then deny the process of determination of one cognition by another. Say that instants and lines are fictions; only say, also, that states of cognition and judgments are fictions. The point here insisted on is not this or that logical solution of the difficulty, but merely that \textit{cognition arises by a process of beginning} as any other change comes to pass.

In a subsequent paper, I shall trace the consequences of these principles, in reference to the questions of reality, of individuality, and of the validity of the laws of logic.
Some Consequences of Four Incapacities

P 27: Journal of Speculative Philosophy 2 (1868):140–57. [Also published in W:271–42 and in CP 5:264–317.] With item 1 above, one of Peirce’s two “strongest philosophical works,” this article develops an account of mind and reality from the ground prepared in item 2. Peirce asserts that all mental events are valid inferences, and claims that as every thought is a sign, so man himself is a sign. He also gives a fairly detailed account of his theory of signs as of 1868, and makes his first published declaration for scholastic realism. (Peirce’s philosophy of mind as developed here is, according to Christopher Hookway, a type of functionalism.)

Descartes is the father of modern philosophy, and the spirit of Cartesianism—that which principally distinguishes it from the scholasticism which it displaced—may be compendiously stated as follows:

1. It teaches that philosophy must begin with universal doubt, whereas scholasticism had never questioned fundamentals.
2. It teaches that the ultimate test of certainty is to be found in the individual consciousness; whereas scholasticism had rested on the testimony of sages and of the Catholic Church.
3. The multiform argumentation of the middle ages is replaced by a single thread of inference depending often upon inconspicuous premises.
4. Scholasticism had its mysteries of faith, but undertook to explain all created things. But there are many facts which Cartesianism not only does not explain, but renders absolutely inexplicable, unless to say that “God makes them so” is to be regarded as an explanation.

In some, or all of these respects, most modern philosophers have been, in effect, Cartesians. Now without wishing to return to scholasticism, it seems to me that modern science and modern logic require us to stand upon a very different platform from this.

I. We cannot begin with complete doubt. We must begin with all the prejudices which we actually have when we enter upon the study of philosophy. These prejudices are not to be dispelled by a maxim, for they are things which it does not occur to us can be questioned. Hence this initial scepticism will be a mere self-deception, and not real doubt; and no one who follows the Cartesian method will ever be satisfied until he has formally recovered all those beliefs which in form he has given up. It is, therefore, as useless a preliminary as going to the North Pole would be in order to get to Constantinople by coming down regularly upon a meridian. A person may, it is true, in the course of his studies, find reason to doubt what he began by believing; but in that case he doubts because he has a positive reason for it, and not on account of the Cartesian maxim. Let us not pretend to doubt in philosophy what we do not doubt in our hearts.

2. The same formalism appears in the Cartesian criterion, which amounts to this: “Whatever I am clearly convinced of, is true.” If I were really convinced, I should have done with reasoning, and should require no test of certainty. But thus to make single individuals absolute judges of truth is most pernicious. The result is that metaphysicians will all agree that metaphysics has reached a pitch of certainty far beyond that of the physical sciences;—only they can agree upon nothing else. In sciences in which men arrive at agreement, when a theory has been broached, it is considered to be on probation until this agreement is reached. After it is reached, the question of certainty becomes an idle one, because there is no one left who doubts it. We individually cannot reasonably hope to attain the ultimate philosophy which we pursue; we can only seek it, therefore, for the community of philosophers. Hence, if disciplined and candid minds carefully examine a theory and refuse to accept it, this ought to create doubts in the mind of the author of the theory himself.

3. Philosophy ought to imitate the successful sciences in its methods, so far as to proceed only from tangible premises which can be subjected to careful scrutiny, and to trust rather to the multitude and variety of its arguments than to the conclusiveness of any one. Its reasoning should not form a chain which is no stronger than its weakest link, but a cable whose fibres may be ever so slender, provided they are sufficiently numerous and intimately connected.

4. Every unidealistic philosophy supposes some absolutely inexplicable, unanalyzable ultimate; in short, something resulting from mediation itself not susceptible of mediation. Now that anything is thus inexplicable can only be known by reasoning from signs. But the only justification of an inference from signs is that the conclusion explains the fact. [To suppose the fact absolutely inexplicable, is not to explain it, and hence this supposition is never allowable.]

In the last number of this journal will be found a piece entitled “Questions concerning certain Faculties claimed for Man,” which has been written in this spirit of opposition to Cartesianism. That criti-
cism of certain faculties resulted in four denials, which for convenience may here be repeated:

1. We have no power of Introspection, but all knowledge of the internal world is derived by hypothetical reasoning from our knowledge of external facts. (Is any thing is a sort of thing? i.e. in doubt.)

2. We have no power of Intuition, but every cognition is determined logically by previous cognitions.

3. We have no power of thinking without signs.

4. We have no conception of the absolutely incomprehensible.

These propositions cannot be regarded as certain; and, in order to bring them to a further test, it is now proposed to trace them out to their consequences. We may first consider the first alone; then trace the consequences of the first and second; then see what else will result from assuming the third also; and, finally, add the fourth to our hypothetical premises.

In accepting the first proposition, we must put aside all prejudices derived from a philosophy which bases our knowledge of the external world on our self-consciousness. We can admit no statement concerning what passes within us except as a hypothesis necessary to explain what takes place in what we commonly call the external world. Moreover when we have upon such grounds assumed one faculty or mode of action of the mind, we cannot, of course, adopt any other hypothesis for the purpose of explaining any fact which can be explained by our first supposition, but must carry the latter as far as it will go. In other words, we must, as far as we can do so without additional hypotheses, reduce all kinds of mental action to one general type.

The class of modifications of consciousness with which we must commence our inquiry must be one whose existence is indubitable, and whose laws are best known, and, therefore (since this knowledge comes from the outside), which most closely follows external facts; that is, it must be some kind of cognition. Here we may hypothetically admit the second proposition of the former paper, according to which there is no absolutely first cognition of any object, but cognition arises by a continuous process. We must begin, then, with a process of cognition, and with that process whose laws are best understood and must closely follow external facts. This is no other than the process of valid inference, which proceeds from its premise, $A$, to its conclusion, $B$, only if, as a matter of fact, such a proposition as $B$ is always or usually true when such a proposition as $A$ is true. It is a consequence, then, of the first two principles whose results we are to trace out, that we must, as far as we can, without any other supposition than that the mind reasons, reduce all mental action to the formula of valid reasoning.

But does the mind in fact go through the syllogistic process? It is certainly very doubtful whether a conclusion—as something existing in the mind independently, like an image—suddenly displaces two premises existing in the mind in a similar way. But it is a matter of constant experience, that if a man is made to believe in the premises, in the sense that he will act from them and will say that they are true, under favorable conditions he will also be ready to act from the conclusion and to say that it is true. Something, therefore, takes place within the organism which is equivalent to the syllogistic process.

A valid inference is either complete or incomplete. An incomplete inference is one whose validity depends upon some matter of fact not contained in the premises. This implied fact might have been stated as a premise, and its relation to the conclusion is the same whether it is explicitly posited or not, since it is at least virtually taken for granted; so that every valid incomplete argument is virtually complete. Complete arguments are divided into simple and complex. A complex argument is one which from three or more premises concludes what might have been concluded by successive steps in reasonings each of which is simple. Thus, a complex inference comes to the same thing in the end as a succession of simple inferences.

A complete, simple, and valid argument, or syllogism, is either apodictic or probable. An apodictic or deductive syllogism is one whose validity depends unconditionally upon the relation of the fact inferred to the facts posited in the premises. A syllogism whose validity should depend not merely upon its premises, but upon the existence of some other knowledge, would be impossible; for either this other knowledge would be posited, in which case it would be a part of the premises, or it would be implicitly assumed, in which case the inference would be incomplete. But a syllogism whose validity depends partly upon the non-existence of some other knowledge, is a probable syllogism.

A few examples will render this plain. The two following arguments are apodictic or deductive:

1. No series of days of which the first and last are different days of the week exceeds by one a multiple of seven days; now the first and last days of any leap-year are different days of the week, and therefore no leap-year consists of a number of days one greater than a multiple of seven.

2. Among the vowels there are no double letters; but one of the double letters ($w$) is compounded of two vowels: hence, a letter compounded of two vowels is not necessarily itself a vowel.

In both these cases, it is plain that as long as the premises are true, however other facts may be, the conclusions will be true. On the other hand, suppose that we reason as follows:—"A certain man had the Asiatic cholera. He was in a state of collapse, livid, quite cold, and without perceptible pulse. He was bled copiously. During the process he came out of collapse, and the next morning was well enough to be about. Therefore, bleeding tends to cure the cholera." This is a fair
probable inference, provided that the premises represent our whole knowledge of the matter. But if we knew, for example, that recoveries from cholera were apt to be sudden, and that the physician who had reported this case had known of a hundred other trials of the remedy without communicating the result, then the inference would lose all its validity.

The absence of knowledge which is essential to the validity of any probable argument relates to some question which is determined by the argument itself. This question, like every other, is whether certain objects have certain characters. Hence, the absence of knowledge is either whether besides the objects which, according to the premises, possess certain characters, any other objects possess them; or, whether besides the characters which, according to the premises, belong to certain objects, any other characters not necessarily involved in these belong to the same objects. In the former case, the reasoning proceeds as though all the objects (which have certain characters) were known, and this is induction; in the latter case, the inference proceeds as though all the characters requisite to the determination of a certain object or class were known, and this is hypothesis. This distinction, also, may be made more plain by examples.

Suppose we count the number of occurrences of the different letters in a certain English book, which we may call A. Of course, every new letter which we add to our count will alter the relative number of occurrences of the different letters; but as we proceed with our counting, this change will be less and less. Suppose that we find that as we increase the number of letters counted, the relative number of e's approaches nearly 11\(\frac{1}{4}\) per cent of the whole, that of the a's 8\(\frac{1}{2}\) per cent, that of the t's 8 per cent, that of the s's 7\(\frac{1}{2}\) per cent, &c. Suppose we repeat the same observations with half a dozen other English writings (which we may designate as B, C, D, E, F, G) with the like result. Then we may infer that in every English writing of some length, the different letters occur with nearly those relative frequencies.

Now this argument depends for its validity upon our not knowing the proportion of letters in any English writing besides A, B, C, D, E, F, and G. For if we know it in respect to H, and it is not nearly the same as in the others, our conclusion is destroyed at once; if it is the same, then the legitimate inference is from A, B, C, D, E, F, G, and H, and not from the first seven alone. This, therefore, is an induction.

Suppose, next, that a piece of writing in cypher is presented to us, without the key. Suppose we find that it contains something less than 26 characters, one of which occurs about 11\(\frac{1}{4}\) per cent of all the times, another 8\(\frac{1}{2}\) per cent, another 8 per cent, and another 7\(\frac{1}{2}\) per cent. Suppose that when we substitute for these e, t, a, and s, respectively, we are able to see how single letters may be substituted for each of the other characters so as to make sense in English, provided, however, that we allow the spelling to be wrong in some cases. If the writing is of any considerable length, we may infer with great probability that this is the meaning of the cipher.

The validity of this argument depends upon there being no other known characters of the writing in cipher which would have any weight in the matter; for if there are—if we know, for example, whether or not there is any other solution of it—this must be allowed its effect in supporting or weakening the conclusion. This, then, is hypothesis.

All valid reasoning is either deductive, inductive, or hypothetic; or else it combines two or more of these characters. Deduction is pretty well treated in most logical text-books; but it will be necessary to say a few words about induction and hypothesis in order to render what follows more intelligible.

Induction may be defined as an argument which proceeds upon the assumption that all the members of a class or aggregate have all the characteristics which are common to all those members of this class concerning which it is known, whether they have these characters or not; or, in other words, which assumes that that is true of a whole collection which is true of a number of instances taken from it at random. This might be called statistical argument. In the long run, it must generally afford pretty correct conclusions from true premises. If we have a bag of beans partly black and partly white, by counting the relative proportions of the two colors in several different handfuls, we can approximate more or less to the relative proportions in the whole bag, since a sufficient number of handfuls would constitute all the beans in the bag. The central characteristic and key to induction is, that by taking the conclusion so reached as major premise of a syllogism, and the proposition stating that such and such objects are taken from the class in question as the minor premise, the other premise of the induction will follow from them deductively. Thus, in the above example we concluded that all books in English have about 11\(\frac{1}{4}\) per cent of their letters e's. From that as major premise, together with the proposition that A, B, C, D, E, F, and G are books in English, it follows deductively that A, B, C, D, E, F, and G have about 11\(\frac{1}{4}\) per cent of their letters e's. Accordingly, induction has been defined by Aristotle as the inference of the major premise of a syllogism from its minor premise and conclusion. The function of an induction is to substitute for a series of many subjects, a single one which embraces them and an indefinite number of others. Thus it is a species of "reduction of the manifold to unity."

Hypothesis may be defined as an argument which proceeds upon the assumption that a character which is known necessarily to involve a certain number of others, may be probably predicated of any object which has all the characters which this character is known to involve. Just as induction may be regarded as the inference of the major prem-
ise of a syllogism, so hypothesis may be regarded as the inference of the minor premise, from the other two propositions. Thus, the example taken above consists of two such inferences of the minor premises of the following syllogisms:

1. Every English writing of some length in which such and such characters denote $e$, $t$, $a$, and $s$, has about $114$ per cent of the first sort of marks, $81\frac{1}{2}$ of the second, $8$ of the third, and $7\frac{1}{2}$ of the fourth; this secret writing is an English writing of some length, in which such and such characters denote $e$, $t$, $a$, and $s$, respectively:

2. A passage written with such an alphabet makes sense when such and such letters are severally substituted for such and such characters. This secret writing is written with such an alphabet. This secret writing makes sense when such and such substitutions are made.

*The function of hypothesis is to substitute for a great series of predicates forming no unity in themselves, a single one (or small number) which involves them all together (perhaps) with an indefinite number of others. It is, therefore, also a reduction of a manifold to unity.* Every deductive syllogism may be put into the form

"Several persons versed in logic have objected that I have here quite misapplied the term hypothesis, and that what I so designate is an argument from analogy. It is a sufficient reply to say that the example of the cipher has been given as an apt illustration of hypothesis by Descartes (Rule ii, "Oeuvres," Paris, 1649, page 343), by Leibnitz ("Nova Memoriae," lib. iv.), Erdmann, p. 831, and as I learn from D. Stewart, Works, vol. 3, pp. 305 et seq., by Gravesend, Bolscovic, Hartley, and G. L. Le Sage. The term Hypothesis has been used in the following senses:—1. For the theme or proposition forming the subject of discourse. 2. For an assumption. Aristotle divides ideas or propositions adopted without any reason into definitions and hypotheses. The latter are propositions stating the existence of something. Thus the geometer says, "Let there be a triangle." 3. For a condition in a general sense. We are said to seek other things than happiness $e$, $b$ $c$, conditionally. The best republic is the ideally perfect, the second the best on earth, the third the best $e$, $b$ $c$, under the circumstances. Freedom is the $b$ $c$, or condition of democracy. 4. For the antecedent of a hypothetical proposition. 5. For an oracular question which assumes facts. 6. In the Synopsis of Peirce, for the reference of a subject to the things it denotes. 7. Most commonly in modern times, for the conclusion of an argument from consequence and consequent to antecedent. This is my use of the term. 8. For such a conclusion when too weak to be a theory accepted into the body of a science.

I give a few authorities to support the seventh use:

"Observa.—Lesion Ratione, 1st Ed.—"Hypothesis est proposition, qua assumitur ad probandum aliun veritatem incognitam. Requirunt multi, ut habeas hypothesis vera cognoscatur, etiam ante quem appareat, quia ex ea deduci possint. Verum si unus alii, hoc unum desiderari, ut hypothesis pro vera admittatur, quia nemo ex hac talia deducatur, quae respondent phenomenis, et satisfacere omnium difficultatibus, quae habere parte in iis, magna de ea apparent, occurrerebat."—Newton.—"Hactenus phena non ex oritur, et maris nostr in per vim gravitatis exposui, sed causam gravitatis nondum assignavi, . . . Rationem vero habu gradivatis

And as the minor premise in this form appears as antecedent or reason of a hypothetical proposition, hypothetic inference may be called reasoning from consequent to antecedent.

The argument from analogy, which a popular writer upon logic calls reasoning from particulars to particulars, derives its validity from its combining the characters of induction and hypothesis, being analyzable either into a deduction or an induction, or a deduction and a hypothesis.

But though inference is thus of three essentially different species, it also belongs to one genus. We have seen that no conclusion can be legitimately derived which could not have been reached by successions.
of arguments having two premises each, and implying no fact not asserted.

Either of these premises is a proposition asserting that certain objects have certain characters. Every term of such a proposition stands either for certain objects or for certain characters. The conclusion may be regarded as a proposition substituted in place of the premise, the substitution being justified by the fact stated in the other premise. The conclusion is accordingly derived from either premise by substituting either a new subject for the subject of the premise, or a new predicate for the predicate of the premise, or by both substitutions. Now the substitution of one term for another can be justified only so far as the term substituted represents only what is represented in the term replaced. If, therefore, the conclusion be denoted by the formula,

\[ S \text{ is } P; \]

and this conclusion be derived, by a change of subject, from a premise which may on this account be expressed by the formula,

\[ M \text{ is } P; \]

then the other premise must assert that whatever thing is represented by \( S \) is represented by \( M \), or that

\[ \text{Every } S \text{ is an } M; \]

while, if the conclusion, \( S \) is \( P \), is derived from either premise by a change of predicate, that premise may be written

\[ S \text{ is } M; \]

and the other premise must assert that whatever characters are implied in \( P \) are implied in \( M \), or that

\[ \text{Whatever is } M \text{ is } P. \]

In either case, therefore, the syllogism must be capable of expression in the form,

\[ S \text{ is } M; M \text{ is } P; \]

\[ \therefore S \text{ is } P. \]

Finally, if the conclusion differs from either of its premises, both in subject and predicate, the form of statement of conclusion and premise may be so altered that they shall have a common term. This can always be done, for if \( P \) is the premise and \( C \) the conclusion, they may be stated thus:

The state of things represented in \( P \) is real, and

The state of things represented in \( C \) is real.
we fear may be true, or in following some other wrong rule of inference. But experience shows that the calm and careful consideration of the same distinctly conceived premises (including prejudices) will insure the pronouncement of the same judgment by all men. Now if a fallacy belongs to the first of these four classes and its premises are false, it is to be presumed that the procedure of the mind from these premises to the conclusion is either correct, or errs in one of the other three ways; for it cannot be supposed that the mere falsity of the premises should affect the procedure of reason when that falsity is not known to reason. If the fallacy belongs to the second class and has some force, however little, it is a legitimate probable argument, and belongs to the type of valid inference. If it is of the third class and results from the confusion of one proposition with another, this confusion must be owing to a resemblance between the two propositions; that is to say, the person reasoning, seeing that one proposition has some of the characters which belong to the other, concludes that it has all the essential characters of the other, and is equivalent to it. Now this is a hypothetic inference, which though it may be weak, and though its conclusion happens to be false, belongs to the type of valid inferences; and, therefore, as the nodus of the fallacy lies in this confusion, the procedure of the mind in these fallacies of the third class conforms to the formula of valid inference. If the fallacy belongs to the fourth class, it either results from wrongly applying or misapprehending a rule of inference, and so is a fallacy of confusion, or it results from adopting a wrong rule of inference. In this latter case, this rule is in fact taken as a premise, and therefore the false conclusion is owing merely to the falsity of a premise. In every fallacy, therefore, possible to the mind of man, the procedure of the mind conforms to the formula of valid inference.

The third principle, whose consequences we have to deduce is, that, whenever we think, we have present to the consciousness some feeling, image, conception, or other representation, which serves as a sign. But it follows from our own existence (which is proved by the occurrence of ignorance and error) that everything which is present to us is a phenomenal manifestation of ourselves. This does not prevent its being a phenomenon of something without us, just as a rainbow is at once a manifestation both of the sun and of the rain. When we think, then, we ourselves, as we are at that moment, appear as a sign. Now a sign has, as such, three references: 1st, it is a sign to some thought which interprets it; 2d, it is a sign for some object to which in that thought it is equivalent; 3d, it is a sign, in some respect or quality, which brings it into connection with its object. Let us ask what the three correlates are to which a thought-sign refers.

1. When we think, to what thought does that thought-sign which

is ourself address itself? It may, through the medium of outward expression, which it reaches perhaps only after considerable internal development, come to address itself to thought of another person. But whether this happens or not, it is always interpreted by a subsequent thought of our own. If, after any thought, the current of ideas flows on freely, it follows the law of mental association. In that case, each former thought suggests something to the thought which follows it, i.e., is the sign of something to this latter. Our train of thought may, it is true, be interrupted. But we must remember that, in addition to the principal element of thought at any moment, there are a hundred things in our mind to which but a small fraction of attention or consciousness is conceded. It does not, therefore, follow, because a new constituent of thought gets the uppermost, that the train of thought which it displaces is broken off altogether. On the contrary, from our second principle, that there is no intuition or cognition not determined by previous cognitions, it follows that the striking in of a new experience is never an instantaneous affair, but is an event occupying time, and coming to pass by a continuous process. Its prominence in consciousness, therefore, must probably be the consummation of a growing process; and if so, there is no sufficient cause for the thought which had been the leading one just before, to cease abruptly and instantaneously. But if a train of thought ceases by gradually dying out, it freely follows its own law of association as long as it lasts, and there is no moment at which there is a thought belonging to this series, subsequently to which there is not a thought which interprets or repeats it. There is no exception, therefore, to the law that every thought-sign is translated or interpreted in a subsequent one, unless it be that all thought comes to an abrupt and final end in death.

2. The next question is: For what does the thought-sign stand—what does it name—what is its suppositum? The outward thing, undoubtedly, when a real outward thing is thought of. But still, as the thought is determined by a previous thought of the same object, it only refers to the thing through denoting this previous thought. Let us suppose, for example, that Toussaint is thought of, and first thought of as a Negro, but not distinctly as a man. If this distinctness is afterwards added, it is through the thought that a Negro is a man; that is to say, the subsequent thought, man, refers to the outward thing by being predicated of that previous thought, Negro, which has been had of that thing. If we afterwards think of Toussaint as a general, then we think that this Negro, this man, was a general. And so in every case the subsequent thought denotes what was thought in the previous thought.

3. The thought-sign stands for its object in the respect which is thought; that is to say, this respect is the immediate object of conscious-
ness in the thought, or, in other words, it is the thought itself, or at least what the thought is thought to be in the subsequent thought to which it is a sign.

We must now consider two other properties of signs which are of great importance in the theory of cognition. Since a sign is not identical with the thing signified, but differs from the latter in some respects, it must plainly have some characters which belong to it in itself, and have nothing to do with its representative function. These I call the 

**Material qualities of the sign.** As examples of such qualities, take in the word “man” its consisting of three letters—in a picture, its being flat and without relief. In the second place, a sign must be capable of being connected (not in the reason but really) with another sign of the same object, or with the object itself. Thus, words would be of no value at all unless they could be connected into sentences by means of a real copula which joins signs of the same thing. The usefulness of some signs—as a weathercock, a tally, &c.—consists wholly in their being really connected with the very things they signify. In the case of a picture such a connection is not evident, but it exists in the power of association which connects the picture with the brain-sign which labels it. This real, physical connection of a sign with its object, either immediately or by its connection with another sign, I call the **Pure demonstrative application of the sign.** Now the representative function of a sign lies neither in its material quality nor in its pure demonstrative application; because it is something which the sign is, not in itself or in a real relation to its object, but which it is to a thought, while both of the characters just defined belong to the sign independently of its addressing any thought. And yet if I take all the things which have certain qualities and physically connect them with another series of things, each to each, they become fit to be signs. If they are not regarded as such they are not actually signs, but they are so in the same sense, for example, in which an unseen flower can be said to be red, this being also a term relative to a mental affection.

Consider a state of mind which is a conception. It is a conception by virtue of having a **meaning**, a logical comprehension; and if it is applicable to any object, it is because that object has the characters contained in the comprehension of this conception. Now the logical comprehension of a thought is usually said to consist of the thoughts contained in it; but thoughts are events, acts of the mind. Two thoughts are two events separated in time, and one cannot literally be contained in the other. It may be said that all thoughts exactly similar are regarded as one; and that to say that one thought contains another, means that it contains one exactly similar to that other. But how can two thoughts be similar? Two objects can only be **regarded** as similar if they are compared and brought together in the mind. Thoughts have no existence except in the mind; only as they are regarded do they exist. Hence, two thoughts cannot be similar unless they are brought together in the mind. But, as to their existence, two thoughts are separated by an interval of time. We are too apt to imagine that we can frame a thought similar to a past thought, by matching it with the latter, as though this past thought were still present to us. But it is plain that the knowledge that one thought is similar to or in any way truly representative of another, cannot be derived from immediate perception, but must be an hypothesis (unquestionably fully justifiable by facts), and that therefore the formation of such a representing thought must be dependent upon a real effective force behind consciousness, and not merely upon a mental comparison. What we must mean, therefore, by saying that one concept is contained in another, is that we normally represent one to be in the other; that is, that we form a particular kind of judgment, of which the subject signifies one concept and the predicate the other.

No thought in itself, then, no feeling in itself, contains any others, but is absolutely simple and unanalyzable; and to say that it is composed of other thoughts and feelings, is like saying that a movement upon a straight line is composed of the two movements of which it is the resultant; that is to say, it is a metaphor, or fiction, parallel to the truth. Every thought, however artificial and complex, is, so far as it is immediately present, a mere sensation without parts, and therefore, in itself, without similarity to any other, but incomparable with any other and absolutely sui generis.† Whatever is wholly incomparable with anything else is wholly inexplicable, because explanation consists in bringing things under general laws or under natural classes. Hence every thought, in so far as it is a feeling of a peculiar sort, is simply an ultimate, inexplicable fact. Yet this does not conflict with my postulate that no fact should be allowed to stand as inexplicable; for, on the one hand, we never can think, "This is present to me," since, before we have time to make the reflection, the sensation is past, and, on the other hand, when once past, we can never bring back the quality of the feeling as it was in and for itself, or know what it was like in itself, or even discover the existence of this quality except by a corollary from our general theory of ourselves, and then not in its idiosyncrasy, but only as something present. But, as something present, feelings are all alike and require no explanation, since they contain only what is universal. So that nothing which we can truly predicate of feelings is

*A judgment concerning a minimum of information, for the theory of which see my paper on Comprehension and Extension, in the Proceedings of the American Academy of Arts and Sciences, vol. 7, p. 426. [W2-70–86.]

†Observe that I say in itself. I am not so wild as to deny that my sensation of red to-day is like my sensation of red yesterday. I only say that the similarity can consist only in the physiological force behind consciousness,—which leads me to say, I recognize this feeling the same as the former one, and so does not consist in a community of sensation.
Some Consequences of Four Incapacities

principle that every thing to which such and such a sensation belongs, has such and such a complicated series of predicates, is not one determined by reason (as we have seen), but is of an arbitrary nature. Hence, the class of hypothetic inferences which the arising of a sensation resembles, is that of reasoning from definition to definitum, in which the major premise is of an arbitrary nature. Only in this mode of reasoning, this premise is determined by the conventions of language, and expresses the occasion upon which a word is to be used; and in the formation of a sensation, it is determined by the constitution of our nature, and expresses the occasions upon which sensation, or a natural mental sign, arises. Thus, the sensation, so far as it represents something, is determined, according to a logical law, by previous cognitions; that is to say, these cognitions determine that there shall be a sensation. But so far as the sensation is a mere feeling of a particular sort, it is determined only by an inexplicable, occult power; and so far, it is not a representation, but only the material quality of a representation. For just as in reasoning from definition to definitum, it is indifferent to the logician how the defined word shall sound, or how many letters it shall contain, so in the case of this constitutional word, it is not determined by an inward law how it shall feel in itself. A feeling, therefore, as a feeling, is merely the material quality of a mental sign.

But there is no feeling which is not also a representation, a predicate of something determined logically by the feelings which precede it. For if there are any such feelings not predicates, they are the emotions. Now every emotion has a subject. If a man is angry, he is saying to himself that this or that is vile and outrageous. If he is in joy, he is saying “this is delicious.” If he is wondering, he is saying “this is strange.” In short, whenever a man feels, he is thinking of something. Even those passions which have no definite object—as melancholy—only come to consciousness through tinging the objects of thought. That which makes us look upon the emotions more as affections of self than other cognitions, is that we have found them more dependent upon our accidental situation at the moment than other cognitions; but that is only to say that they are cognitions too narrow to be useful. The emotions, as a little observation will show, arise when our attention is strongly drawn to complex and inconceivable circumstances. Fear arises when we cannot predict our fate; joy, in the case of certain indescribable and peculiarly complex sensations. If there are some indications that something greatly for my interest, and which I have anticipated would happen, may not happen; and if, after weighing probabilities, and inventing safeguards, and striving for further information, I find myself unable to come to any fixed conclusion in reference to the future, in the place of that intellectual hypothetic inference which I seek, the feeling of anxiety arises. When something
happens for which I cannot account, I wonder. When I endeavor to realize to myself what I never can do, a pleasure in the future, I hope.

"I do not understand you," is the phrase of an angry man. The indescribable, the ineffable, the incomprehensible, commonly excite emotion; but nothing is so chilling as a scientific explanation. Thus an emotion is always a simple predicate substituted by an operation of the mind for a highly complicated predicate. Now if we consider that a very complex predicate demands explanation by means of an hypothesis, that that hypothesis must be a simpler predicate substituted for that complex one; and that when we have an emotion, an hypothesis, strictly speaking, is hardly possible—the analogy of the parts played by emotion and hypothesis is very striking. There is, it is true, this difference between an emotion and an intellectual hypothesis, that we have reason to say in the case of the latter, that to whatever the simple hypothetic predicate can be applied, of that the complex predicate is true; whereas, in the case of an emotion this is a proposition for which no reason can be given, but which is determined merely by our emotional constitution. But this corresponds precisely to the difference between hypothesis and reasoning from definition to definitum, and thus it would appear that emotion is nothing but sensation. There appears to be a difference, however, between emotion and sensation, and I would state it as follows:

There is some reason to think that, corresponding to every feeling within us, some motion takes place in our bodies. This property of the thought-sign, since it has no rational dependence upon the meaning of the sign, may be compared with what I have called the material quality of the sign; but it differs from the latter inasmuch as it is not essentially necessary that it should be felt in order that there should be any thought-sign. In the case of a sensation, the manifold of impressions which precede and determine it are not of a kind, the bodily motion corresponding to which comes from any large ganglion or from the brain, and probably for this reason the sensation produces no great commotion in the bodily organism; and the sensation itself is not a thought which has a very strong influence upon the current of thought except by virtue of the information it may serve to afford. An emotion, on the other hand, comes much later in the development of thought—I mean, further from the first beginning of the cognition of its object—and the thoughts which determine it already have motions corresponding to them in the brain, or the chief ganglion; consequently, it produces large movements in the body, and independently of its representative value, strongly affects the current of thought. The animal motions to which I allude, are, in the first place and obviously, blushing, blenching, staring, smiling, scowling, pouting, laughing, weeping, sobbing, wriggling, flinching, trembling, being petrified, sighing, sniffling, shrugging, groaning, heartsinking, trepidation,

swelling of the heart, etc., etc. To these may, perhaps, be added, in the second place, other more complicated actions, which nevertheless spring from a direct impulse and not from deliberation.

What which distinguishes both sensations proper and emotions from the feeling of a thought is that in the case of the former the material quality is made prominent, because the thought has no relation of reason to the thoughts which determine it, which exists in the last case and detracts from the attention given to the mere feeling. By there being no relation of reason to the determining thoughts, I mean that there is nothing in the content of the thought which explains why it should arise only on occasion of these determining thoughts. If there is such a relation of reason if the thought is essentially limited in its application to these objects, then the thought comprehends a thought other than itself; in other words, it is then a complex thought. An incomplete thought can, therefore, be nothing but a sensation or emotion, having no rational character. This is very different from the ordinary doctrine, according to which the very highest and most metaphysical conceptions are absolutely simple. I shall be asked how such a conception of a being is to be analyzed, or whether I can ever define one, two, and three, without a diademe. Now I shall admit at once that neither of these conceptions can be separated into two others higher than itself; and in that sense, therefore, I fully admit that certain very metaphysical and eminently intellectual notions are absolutely simple. But though these concepts cannot be defined by genus and difference, there is another way in which they can be defined. All determination is by negation; we can first recognize any character only by putting an object which possesses it into comparison with an object which possesses it not. A conception, therefore, which was quite universal in every respect would be unrecognizable and impossible. We do not obtain the conception of Being, in the sense implied in the copula, by observing that all the things which we can think of have something in common, for there is no such thing to be observed. We get it by reflecting upon signs—words or thoughts;—we observe that different predicates may be attached to the same subject, and that each makes some conception applicable to the subject; then we imagine that a subject has something true of it merely because a predicate (no matter what) is attached to it,—and that we call Being. The conception of being is, therefore, a conception about a sign—a thought, or word;—and since it is not applicable to every sign, it is not primarily universal, although it is so in its mediate application to things. Being, therefore, may be defined; it may be defined, for example, as that which is common to the objects included in any class, and to the objects not included in the same class. But it is nothing new to say that metaphysical conceptions are primarily and at bottom thoughts about words, or thoughts about thoughts; it is the doctrine both of Aristotle (whose
Sensation and the power of abstraction or attention may be regarded as, in one sense, the sole constituents of all thought. Having considered the former, let us now attempt some analysis of the latter. By the force of attention, an emphasis is put upon one of the objective elements of consciousness. This emphasis is, therefore, not itself an object of immediate consciousness; and in this respect it differs entirely from a feeling. Therefore, since the emphasis, nevertheless, consists in some effect upon consciousness, and so can exist only so far as it affects our knowledge; and since an act cannot be supposed to determine which precedes it in time, this act can consist only in the capacity which the cognition emphasized has for producing an effect upon memory, or otherwise influencing subsequent thought. This is confirmed by the fact that attention is a matter of continuous quantity; for continuous quantity, so far as we know it, reduces itself in the last analysis to time. Accordingly, we find that attention does, in fact, produce a very great effect upon subsequent thought. In the first place, it strongly affects memory, a thought being remembered for a longer time the greater the attention originally paid to it. In the second place, the greater the attention, the closer the connection and the more accurate the logical sequence of thought. In the third place, by attention a thought may be recovered which has been forgotten. From these facts, we gather that attention is the power by which thought at one time is connected with and made to relate to thought at another time; or, to apply the conception of thought as a sign, that it is the pure demonstrative application of a thought-sign.

Attention is roused when the same phenomenon presents itself repeatedly on different occasions, or the same predicate in different subjects. We see that A has a certain character, that B has the same, C has the same; and this excites our attention, so that we say, “These have this character.” Thus attention is an act of induction, but it is an induction which does not increase our knowledge, because our “these” covers nothing but the instances experienced. It is, in short, an argument from enumeration.

Attention produces effects upon the nervous system. These effects are habits, or nervous associations. A habit arises, when, having had the sensation of performing a certain act, m, on several occasions a, b, c, we come to do it upon every occurrence of the general event, l, of which a, b, and c are special cases. That is to say, by the cognition that

Every case of a, b, or c, is a case of m,

is determined the cognition that

Every case of l is a case of m.

Thus the formation of a habit is an induction, and is therefore necessarily connected with attention or abstraction. Voluntary actions result from the sensations produced by habits, as instinctive actions result from our original nature.

We have thus seen that every sort of modification of consciousness—Attention, Sensation, and Understanding—is an inference. But the objection may be made that inference deals only with general terms, and that any image or absolutely singular representation, cannot therefore be inferred.

(Singular) and (individual) are equivocal terms. A singular may mean that which can be but in one place at one time. In this sense it is not opposed to general. The sun is a singular in this sense, but, as is explained in every good treatise on logic, it is a general term. I may have a very general conception of Hermolaus Barbarus, but still I conceive him only as able to be in one place at one time. When an image is said to be singular, it is meant that it is absolutely determinate in all respects. Every possible character, or the negative thereof, must be true of such an image. In the words of the most eminent expounder of the doctrine, the image of a man “must be either of a white, or a black, or a tawny; a straight, or a crooked; a tall, or a low, or a middle-sized man.” It must be of a man with his mouth open or his mouth shut, whose hair is precisely of such and such a shade, and whose figure has precisely such and such proportions. No statement of Locke has been so scouted by all friends of images as his denial that the “idea” of a triangle must be either of an obtuse-angled, right-angled, or acute-angled triangle. In fact, the image of a triangle must be of one, each of whose angles is of a certain number of degrees, minutes, and seconds.

This being so, it is apparent that no man has a true image of the road to his office, or of any other real thing. Indeed he has no image of it at all unless he can not only recognize it, but imagines it (truly or falsely) in all its infinite details. This being the case, it becomes very doubtful whether we ever have any such thing as an image in our imagination. Please, reader, to look at a bright red book, or other brightly colored object, and then to shut your eyes and say whether you see that color, whether brightly or faintly—whether, indeed, there is anything like sight there. Hume and the other followers of Berkeley maintain that there is no difference between the sight and the memory of the red book except in “their different degrees of force and vivacity.” “The colors which the memory employs,” says Hume, “are faint and dull compared with those in which our original perceptions are clothed.” If this were a correct statement of the difference, we should remember the book as being less red than it is; whereas, in fact, we remember the color with very great precision for a few moments [please to test this point, reader], although we do not see any thing like
distinguishing between one subjective mode of cognition and another, and hence often think that something is presented to us as a picture, while it is really constructed from slight data by the understanding. This is the case with dreams, as is shown by the frequent impossibility of giving an intelligible account of one without adding something which we feel was not in the dream itself. Many dreams, of which the waking memory makes elaborate and consistent stories, must probably have been in fact mere jumbles of these feelings of the ability to recognize this and that which I have just alluded to.

I will now go so far as to say that we have no images even in actual perception. It will be sufficient to prove this in the case of vision; for if no picture is seen when we look at an object, it will not be claimed that hearing, touch, and the other senses, are superior to sight in this respect. That the picture is not painted on the nerves of the retina is absolutely certain, if, as physiologists inform us, these nerves are needle-points pointing to the light and at distances considerably greater than the minimum visible. The same thing is shown by our not being able to perceive that there is a large blind spot near the middle of the retina. If, then, we have a picture before us when we see, it is one constructed by the mind at the suggestion of previous sensations. Supposing these sensations to be signs, the understanding by reasoning from them could attain all the knowledge of outward things which we derive from sight, while the sensations are quite inadequate to forming an image or representation absolutely determinate. If we have such an image or picture, we must have in our minds a representation of a surface which is only a part of every surface we see, and we must see that each part, however small, has such and such a color. If we look from some distance at a speckled surface, it seems as if we did not see whether it were speckled or not; but if we have an image before us, it must appear to us either as speckled, or as not speckled. Again, the eye by education comes to distinguish minute differences of color; but if we see only absolutely determinate images, we must, no less before our eyes are trained than afterwards, see each color as particularly such and such a shade. Thus to suppose that we have an image before us when we see, is not only a hypothesis which explains nothing whatever, but is one which actually creates difficulties which require new hypotheses in order to explain them away.

One of these difficulties arises from the fact that the details are less easily distinguished than, and forgotten before, the general circumstances. Upon this theory, the general features exist in the details; the details are, in fact, the whole picture. It seems, then, very strange that that which exists only secondarily in the picture should make more impression than the picture itself. It is true that in an old painting the details are not easily made out; but this is because we know that the
blackness is the result of time, and is no part of the picture itself. There is no difficulty in making out the details of the picture as it looks at present; the only difficulty is in guessing what it used to be. But if we have a picture on the retina, the minutest details are there as much as, nay, more than, the general outline and significance of it. Yet that which must actually be seen, it is extremely difficult to recognize; while that which is only abstracted from what is seen is very obvious.

But the conclusive argument against our having any images, or absolutely determinate representations in perception, is that in that case we have the materials in each such representation for an infinite amount of conscious cognition, which we yet never become aware of. Now there is no meaning in saying that we have something in our minds which never has the least effect on what we are conscious of knowing. The most that can be said is, that when we see we are put in a condition in which we are able to get a very large and perhaps indefinitely great amount of knowledge of the visible qualities of objects.

Moreover, that perceptions are not absolutely determinate and singular is obvious from the fact that each sense is an abstracting mechanism. Sight by itself informs us only of colors and forms. No one can pretend that the images of sight are determinate in reference to taste. They are, therefore, so far general that they are neither sweet nor non-sweet, bitter nor non-bitter, having a power or insipid.

The next question is whether we have any general conceptions except in judgments. In perception, where we know a thing as existing, it is plain that there is a judgment that the thing exists, since a more general concept of a thing is in no case a cognition of it as existing. It has usually been said, however, that we can call up any concept without making any judgment; but it seems that in this case we only arbitrarily suppose ourselves to have an experience. In order to conceive the number 7, I suppose, that is, I arbitrarily make the hypothesis or judgment, that there are certain points before my eyes, and I judge that these are seven. This seems to be the most simple and rational view of the matter, and I may add that it is the one which has been adopted by the best logicians. If this be the case, what goes by the name of the association of images is in reality an association of judgments. The association of ideas is said to proceed according to three principles—those of resemblance, of contiguity, and of causality. But it would be equally true to say that signs denote what they do on the three principles of resemblance, contiguity, and causality. There can be no question that anything is a sign of whatever is associated with it by resemblance, by contiguity, or by causality: nor can there be any doubt that any sign recalls the thing signified. So, then, the association of ideas consists in this, that a judgment occasions another judgment, of which it is the sign. Now this is nothing less nor more than inference.

Everything in which we take the least interest creates in us its own particular emotion, however slight this may be. This emotion is a sign and a predicate of the thing. Now, when something resembling this thing is presented to us, a similar emotion arises; hence, we immediately infer that the latter is like the former. A formal logician of the old school may say, that in logic no term can enter into the conclusion which had not been contained in the premises, and that therefore the suggestion of something new must be essentially different from inference. But I reply that that rule of logic applies only to those arguments which are technically called completed. We can and do reason—

Elias was a man;

∴ He was mortal.

And this argument is just as valid as the full syllogism, although it is so only because the major premise of the latter happens to be true. If to pass from the judgment “Elias was a man” to the judgment “Elias was mortal,” without actually saying to one’s self that “All men are mortal,” is not inference, then the term “inference” is used in so restricted a sense that inferences hardly occur outside of a logic-book.

What is here said of association by resemblance is true of all association. All association is by signs. Everything has its subjective or emotional qualities, which are attributed either absolutely or relatively, or by conventional imputation to anything which is a sign of it. And so we reason,

The sign is such and such;

∴ The sign is that thing.

This conclusion receiving, however, a modification, owing to other considerations, so as to become—

The sign is almost (is representative of) that thing.

We come now to the consideration of the last of the four principles whose consequences we were to trace; namely, that the absolutely recognizable is absolutely inconceivable. That upon Cartesian principles the very realities of things can never be known in the least, most competent persons must long ago have been convinced. Hence the breaking forth of idealism, which is essentially anti-Cartesian, in every direction, whether among empiricists (Berkeley, Hume), or among nouleologists (Hegel, Fichte). The principle now brought under discussion is directly realistic; for, since the meaning of a word is the conception it conveys, the absolutely recognizable has no meaning
because no conception attaches to it. It is, therefore, a meaningless word; and, consequently, whatever is meant by any term as "the real" is cognizable in some degree, and so is the nature of a cognition, in the objective sense of that term.

At any moment we are in possession of certain information, that is, of cognitions which have been logically derived by induction and hypothesis from previous cognitions which are less general, less distinct, and of which we have a less visibly consciousness. These in their turn have been derived from others still less general, less distinct, and less vivid; and so on back to the ideal first, which is quite singular, and quite out of consciousness. This ideal first is the particular thing-in-itself. It does not exist as such. That is, there is no thing which is in-itself in the sense of not being relative to the mind, though things which are relative to the mind doubtless are, apart from that relation.

The cognitions which thus reach us by this infinite series of inductions and hypotheses (which though infinite a parte ante logica, is yet as one continuous process not without a beginning in time) are of two kinds, the true and the untrue, or cognitions whose objects are real and those whose objects are unreal. And what do we mean by the real? It is a conception which we must first have had when we discovered that there was an unreal, an illusion; that is, when we first corrected ourselves. Now the distinction for which alone this fact logically called, was between an ens relative to private inward determinations, to the negations belonging to idiosyncrasy, and an ens such as would stand in the long run. The real, then, is that which, sooner or later, information and reasoning would finally result in, and which is therefore independent of the vagaries of me and you. Thus, the very origin of the conception of reality shows that this conception essentially involves the notion of a COMMUNITY, without definite limits, and capable of an indefinite increase of knowledge. And so those two series of cognitions—the real and the unreal—consist of those which, at a time sufficiently future, the community will always continue to reaffirm; and of those which, under the same conditions, will ever after be denied. Now, a proposition whose falsity can never be discovered, and the error of which therefore is absolutely recognizable, contains, upon our principle, absolutely no error. Consequently, that which is thought in these cognitions is the real, as it really is. There is nothing, then, to prevent our knowing outward things as they really are, and it is most likely that we do thus know them in numberless cases, although we can never be absolutely certain of doing so in any special case.

But it follows that since no cognition of ours is absolutely determinate, general must have a real existence. Now this scholastic realism is usually set down as a belief in metaphysical fictions. But, in fact, a realist is simply one who knows no more recondite reality than that which is represented in a true representation. Since, therefore, the word "man" is true of something, that which "man" means is real. The nominalist must admit that man is truly applicable to something; but he believes that there is beneath this a thing in itself, an ignorable reality. His is the metaphysical fiction. Modern nominalists are mostly superficial men, who do not know, as the more thorough Roscellinus and Occam did, that a reality which has no representation is one which has no relation and no quality. The great argument for nominalism is that there is no man unless there is some particular man. That, however, does not affect the realism of Scotus; for although there is no man of whom all further determination can be denied, yet [there is a man, abstraction being made of all further determination]. There is a real difference between man irrespective of what the other determinations may be, and man with this or that particular series of determinations, although undoubtedly this difference is only relative to the mind and not in re. Such is the position of Scotus. * Occam's great objection is, there can be no real distinction which is not in re, in the thing-in-itself; but this begs the question, for it is itself based only on the notion that reality is something independent of representative relation.

Such being the nature of reality in general, in what does the reality of the mind consist? We have seen that the content of consciousness, the entire phenomenal manifestation of mind, is a sign resulting from inference. Upon our principle, therefore, that the absolutely recognizable does not exist, so that the phenomenal manifestation of a substance is the substance, we must conclude that the mind is a sign developing according to the laws of inference. What distinguishes a man from a word? There is a distinction doubtless. The material qualities, the forces which constitute the pure denotative application, and the meaning of the human sign, are all exceedingly complicated in comparison with those of the word. But these differences are only relative. What other is there? It may be said that man is conscious, while a word is not. But "consciousness" is a very vague term. It may mean that emotion which accompanies the reflection that we have animal life. This is a consciousness which is dimmed

*By an ideal, I mean the limit which the possible cannot attain.

**Eadem natura est, que in existentia per gradum singularitatis est determinata, et in intellectu, hoc est ut habet relationem ad intellectum ut cognitum ad cognoscens, est indeterminata."—Quinti vetus Subtilissimus, lib. 7, qu. 48.†

†See his argument Summa logicae, part 1, cap. 16.‡

‡CSP: we expr. not grade of reality, but "grade" in value of annum, practice
when animal life is at its ebb in old age, or sleep, but which is not dimmed when the spiritual life is at its ebb; which is the more lively the better animal a man is, but which is not so, the better man he is. We do not attribute this sensation to words, because we have reason to believe that it is dependent upon the possession of an animal body. But this consciousness, being a mere sensation, is only a part of the material quality of the man-sign. Again, consciousness is sometimes used to signify the I think, or unity in thought; but this unity is nothing but consistency, or the recognition of it. Consistency belongs to every sign, so far as it is a sign; and therefore every sign, since it signifies primarily that it is a sign, signifies its own consistency. The man-sign acquires information, and comes to mean more than he did before. But so do words. Does not electricity mean more now than it did in the days of Franklin? Man makes the word, and the word means nothing which the man has made it mean, and that only to some man. But since man can think only by means of words or other external symbols, these might turn round and say: "You mean nothing which we have not taught you, and then only so far as you address some word as the interpretant of your thought." In fact, therefore, men and words reciprocally educate each other; each increase of a man’s information involves and is involved by a corresponding increase of a word’s information.

Without fatiguing the reader by stretching this parallelism too far, it is sufficient to say that there is no element whatever of man’s consciousness which has not something corresponding to it in the word; and the reason is obvious. It is that the word or sign which man uses is the man himself; for the fact that every thought is a sign, taken in conjunction with the fact that life is a train of thought, proves that man is a sign; so, that every thought is an external sign, proves that man is an external sign. That is to say, the man and the external sign are identical in the same sense in which the words bomo and man are identical. Thus my language is the sum total of myself; for the man is the thought.

It is hard for man to understand this, because he persists in identifying himself with his will, his power over the animal organism, with brute force. Now the organism is only an instrument of thought. But the identity of a man consists in the consistency of what he does and thinks; and consistency is the intellectual character of a thing; that is, is its expressing something.

Finally, as what anything really is, is what it may finally come to be known to be in the ideal state of complete information, so that reality depends on the ultimate decision of the community, so thought is what it is, only by virtue of its addressing a future thought which is in its value as thought identical with it, though more developed. In this way, the existence of thought now, depends on what is to be

hereafter; so that it has only a potential existence, dependent on the future thought of the community.

The individual man, since his separate existence is manifested only by ignorance and error, so far as he is anything apart from his fellows, and from what he and they are to be, is only a negation. This is man, proud man,

Most ignorant of what he’s most assured,
His glassy essence.
I certainly shall have, among the most cultivated and respected of my readers, those who deny that those laws of logic which men generally admit have universal validity. But I address myself also, to those who have no such doubts, for even to them it may be interesting to consider how it is that these principles come to be true. Finally, having put forth in former numbers of this Journal some rather heretical principles of philosophical research, one of which is that nothing can be admitted to be absolutely inexplicable, it behooves me to take up the challenge which has been given me to show how upon my principles the validity of the laws of logic can be other than inexplicable.

I shall be arrested, at the outset, by a sweeping objection to my whole undertaking. It will be said that my deduction of logical principles, being itself an argument, depends for its whole virtue upon the truth of the very principles in question; so that whatever my proof may be, it must take for granted the very things to be proved. But to this I reply, that I am neither addressing absolute sceptics, nor men in any state of fictitious doubt whatever. I require the reader to be candid; and if he becomes convinced of a conclusion, to admit it. There is nothing to prevent a man's perceiving the force of certain special arguments, although he does not yet know that a certain general law of arguments holds good; for the general rule may hold good in some cases and not in others. A man may reason well without understanding the principles of reasoning, just as he may play billiards well without understanding analytical mechanics. If you, the reader, actually find that my arguments have a convincing force with you, it is a mere pretence to call them illogical.

That if one sign denotes generally everything denoted by a second, and this second denotes generally everything denoted by a third, then the first denotes generally everything denoted by the third, is not doubted by anybody who distinctly apprehends the meaning of these words. The deduction of the general form of syllogism, therefore, will consist only of an explanation of the suppositio communis. Now, what

*The word suppositio is one of the useful technical terms of the middle ages which was condemned by the reformists of the renaissance as incorrect. The early logicians made a distinction between significatio and suppositio. Significatio is defined as "rei per vocem secundum plactum representatio." It is a mere affair of lexiconography, and depends on a special convention (secundum plactum), and not on a general principle. Suppositio belongs, not directly to the vox, but to the vox as having this or that significatio. "Unde significatio prior est suppositione et different in hoc, quia significatio est vocis, suppositio vero est termini jam compositi ex voce et significacione." The various suppositiones which may belong to one word with one significatio are the different senses in which the word may be taken, according to the general principles of the language or of logic. Thus, the word table has different significations in the expressions "table of logarithms" and "writing-table"; but the word man has one and the same significatio, and only different suppositiones, in the following sentences: "A man is an animal," "a butcher is a man," "man cooks his food," "man appeared upon the earth at such a date," &c. Some later writers have endeavored to make "acceptio" do service for "suppositio"; but it seems to

*This is not just obeying verbally of laws of logic, but the one that all thought occurs through a logically-valid inference.
the formal logician means by an expression of the form, "Every $M$ is $P$," is that anything of which $M$ is predicatable is $P$; thus, if $S$ is $M$, that $S$ is $P$. The premise that "Every $M$ is $P$" may, therefore, be denied; but to admit it, unambiguously, in the sense intended, is to admit that the inference is good that $S$ is $P$ if $S$ is $M$. He, therefore, who does not deny that $S$ is $P$—$M$, $S$, $P$, being any terms such that $S$ is $M$ and every $M$ is $P$—denies nothing that the formal logician maintains in reference to this matter; and he who does deny this, simply is deceived by an ambiguity of language. How we come to make any judgments in the sense of the above “Every $M$ is $P$" may be understood from the theory of reality put forth in the article in the last number. It was there shown that real things are of a cognitive and therefore significative nature, so that the real is that which signifies something real. Consequently, to predicate anything of anything real is to predicate it of that of which that subject [the real] is itself predicated; for to predicate one thing of another is to state that the former is a sign of the latter.

These considerations show the reason of the validity of the formula,

$$S \text{ is } M; \quad M \text{ is } P;$$

$$\therefore S \text{ is } P.$$ They hold good whatever $S$ and $P$ may be, provided that they be such that any middle term between them can be found. That $P$ should be a negative term, therefore, or that $S$ should be a particular term, would not interfere at all with the validity of this formula. Hence, the following formulae are also valid:

$$S \text{ is } M; \quad M \text{ is not } P;$$

$$\therefore S \text{ is not } P.$$ Some $S$ is $M; \quad M$ is $P;$

$$\therefore \text{ Some } S \text{ is } P.$$ Some $S$ is $M; \quad M$ is not $P;$

$$\therefore \text{ Some } S \text{ is not } P.$$ Moreover, as all that class of inferences which depend upon the introduction of relative terms can be reduced to the general form, they also are shown to be valid. Thus, it is proved to be correct to reason thus:

Every relation of a subject to its predicate is a relation of the relative "not $X$'d, except...

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by the $X$ of some," to its correlate, where $X$ is any relative I please.

Every relation of "man" to "animal" is a relation of a subject to its predicate.

. . . Every relation of "man" to "animal" is a relation of the relative "not $X$'d, except by the $X$ of some," to its correlate, where $X$ is any relative I please.

Every relation of the relative "not $X$'d, except by the $X$ of some," to its correlate, where $X$ is any relative I please, is a relation of the relative "not beheaded, except by the head of some," to its correlate.

. . . Every relation of "man" to "animal" is a relation of the relative "not beheaded, except by the head of some," to its correlate.*

At the same time, as will be seen from this example, the proof of the validity of these inferences depends upon the assumption of the truth of certain general statements concerning relatives. These formula can all be deduced from the principle, that in a system of signs in which no sign is taken in two different senses, two signs which differ only in their manner of representing their object, but which are equivalent in meaning, can always be substituted for one another. Any case of the falsification of this principle would be a case of the dependence of the mode of existence of the thing represented upon the mode of this or that representation of it, which, as has been shown in the article in the last number, is contrary to the nature of reality.

The next formula of syllogism to be considered is the following:

$$S \text{ is other than } P; \quad M \text{ is } P;$$

$$\therefore S \text{ is other than } M.$$ The meaning of "not" or "other than" seems to have greatly perplexed the German logicians, and it may be, therefore, that it is used in different senses. If so, I propose to defend the validity of the above formula only when other than is used in a particular sense. By saying that one thing or class is other than a second, I mean that any third whatever is identical with the class which is composed of that third and of whatever is, at once, the first and second. For example, if I say that rats are not mice, I mean that any third class as dogs is identical

me better, now that scientific terminology is no longer forbidden, to revive supposition. I should add that as the principles of logic and language for the different uses of the different parts of speech are different, supposition must be restricted to the acceptation of a substantive. The term copulatio was used for the acceptation of an adjective or verb.

**If any one will by ordinary syllogism prove that because every man is an animal, therefore every head of a man is a head of an animal, I shall be ready to—set him another question."—De Morgan: "On the Syllogism No. IV, and on the Logic of Relations."
with dogs and rats-which-are-mice; that is to say, the addition of rats-which-are-mice, to anything, leaves the latter just what it was before. This being all that I mean by $S$ is other than $P$, I mean absolutely the same thing when I say that $S$ is other than $P$, that I do when I say that $P$ is other than $S$; and the same when I say that $S$ is other than $M$, that I do when I say that $M$ is other than $S$. Hence the above formula is only another way of writing the following:

$$M \text{ is } P; \ P \text{ is not } S; \quad \therefore \ M \text{ is not } S.$$  

But we have already seen that this is valid.

A very similar formula to the above is the following:

$$S \text{ is } M; \ some \ S \text{ is } P; \quad \therefore \ Some \ M \text{ is } P.$$  

By saying that some of a class is of any character, I mean simply that no statement which implies that none of that class is of that character is true. But to say that none of that class is of that character, is, as I take the word “not,” to say that nothing of that character is of that class. Consequently, to say that some of $A$ is $B$, is, as I understand words and in the only sense in which I defend this formula, to say that some $B$ is $A$. In this way the formula is reduced to the following, which has already been shown to be valid:

$$Some \ P \text{ is } S; \ S \text{ is } M; \quad \therefore \ Some \ P \text{ is } M.$$  

The only demonstrative syllogisms which are not included among the above forms are the Theophrastean moods, which are all easily reduced by means of simple conversions.

Let us now consider what can be said against all this, and let us take up the objections which have actually been made to the syllogistic formula, beginning with those which are of a general nature and then examining those sophisms which have been pronounced irresolvable by the rules of ordinary logic.

It is a very ancient notion that no proof can be of any value, because it rests on premises which themselves equally require proof, which again must rest on other premises, and so back to infinity. This really does show that nothing can be proved beyond the possibility of a doubt; that no argument could be legitimately used against an absolute sceptic; and that inference is only a transition from one cognition to another, and not the creation of a cognition. But the objection is intended to go much further than this, and to show (as it certainly seems to do) that inference not only cannot produce infallible cognition, but that it cannot produce cognition at all. It is true, that since some judgment precedes every judgment inferred, either the first premises were not inferred, or there have been no first premises. But it does not follow that because there has been no first in a series, therefore that series has had no beginning in time; for the series may be continuous, and may have begun gradually, as was shown in an article in No. 3 of this volume, where this difficulty has already been resolved.

A somewhat similar objection has been made by Locke and others, to the effect that the ordinary demonstrative syllogism is a petitio principis, inasmuch as the conclusion is already implicitly stated in the major premise. Take, for example, the syllogism,

$$\text{All men are mortal;}$$
$$\text{Socrates is a man;}$$
$$\therefore \text{Socrates is mortal.}$$

This attempt to prove that Socrates is mortal begs the question, it is said, since if the conclusion is denied by any one, he thereby denies that all men are mortal. But what such considerations really prove is that the syllogism is demonstrative. To call it a petitio principis is a mere confusion of language. It is strange that philosophers, who are so suspicious of the words virtual and potential, should have allowed this “implicit” to pass unchallenged. A petitio principis consists in reasoning from the unknown to the unknown. Hence, a logician who is simply engaged in stating what general forms of argument are valid, can, at most, have nothing more to do with the consideration of this fallacy than to note those cases in which from logical principles a premise of a certain form cannot be better known than a conclusion of the corresponding form. But it is plainly beyond the province of the logician, who has only proposed to state what forms of facts involve what others, to inquire whether man can have a knowledge of universal propositions without a knowledge of every particular contained under them, by means of natural insight, divine revelation, induction, or testimony. The only petitio principis, therefore, which he can notice is the assumption of the conclusion itself in the premise; and this, no doubt, those who call the syllogism a petitio principis believe is done in that formula. But the proposition “All men are mortal” does not in itself involve the statement that Socrates is mortal, but only that “whatever has man truly predicated of it is mortal.” In other words, the conclusion is not involved in the meaning of the premise, but only the validity of the syllogism. So that this objection merely amounts to arguing that the syllogism is not valid, because it is demonstrative.

*Mr. Mill thinks the syllogism is merely a formula for recalling forgotten facts. Whether he means to deny, what all logicians since Kant have held, that the syllogism serves to rend confused thought distinct, or whether he does not know that this is the usual doctrine, does not appear.
A much more interesting objection is that a syllogism is a purely mechanical process. It proceeds according to a bare rule or formula; and a machine might be constructed which would so transpose the terms of premises. This being so (and it is so), it is argued that this cannot be thought; that there is no life in it. Swift has ridiculed the syllogism in the "Voyage to Laputa," by describing a machine for making science:

By this contrivance, the most ignorant person, at a reasonable charge, and with little bodily labor, might write books in philosophy, poetry, politics, laws, mathematics, and theology, without the least assistance from genius or study.\[12\]

The idea involved in this objection seems to be that it requires mind to apply any formula or use any machine. If, then, this mind is itself only another formula, it requires another mind behind it to set it into operation, and so on ad infinitum. This objection fails in much the same way that the first one which we considered failed. It is as though a man should address a land surveyor as follows:—"You do not make a true representation of the land; you only measure lengths from point to point—that is to say, lines. If you observe angles, it is only to solve triangles and obtain the lengths of their sides. And when you come to make your map, you use a pencil which can only make lines, again. So, you have to do solely with lines. But the land is a surface; and no number of lines, however great, will make any surface, however small. You, therefore, fail entirely to represent the land." The surveyor, I think, would reply, "Sir, you have proved that my lines cannot make up the land, and that, therefore, my map is not the land. I never pretended that it was. But that does not prevent it from truly representing the land, as far as it goes. It cannot, indeed, represent every blade of grass; but it does not represent that there is not a blade of grass where there is. To abstract from a circumstance is not to deny it." Suppose the objector were, at this point, to say, "To abstract from a circumstance is to deny it. Wherever your map does not represent a blade of grass, it represents there is no blade of grass. Let us take things on their own valuation." Would not the surveyor reply: "This map is my description of the country. Its own valuation can be nothing but what I say, and all the world understands, that I mean by it. Is it very unreasonable that I should demand to be taken as I mean, especially when I succeed in making myself understood?" What the objector's reply to this question would be, I leave it to any one to say who thinks his position well taken. Now this line of objection is parallel to that which is made against the syllogism. It is shown that no number of syllogisms can constitute the sum total of any mental action, however restricted. This may be freely granted; and yet it will not follow that the syllogism does not truly represent the mental action, as far as it purports to represent it at all. There is reason to believe that the action of the mind is, as it were, a continuous movement. Now the doctrine embodied in syllogistic formulæ (so far as it applies to the mind at all) is, that if two successive positions, occupied by the mind in this movement, be taken, they will be found to have certain relations. It is true that no number of successions of positions can make up a continuous movement; and this, I suppose, is what is meant by saying that a syllogism is a dead formula, while thinking is a living process. But the reply is that the syllogism is not intended to represent the mind, as to its life or deadness, but only as to the relation of its different judgments concerning the same thing. And it should be added that the relation between syllogism and thought does not spring from considerations of formal logic, but from those of psychology. All that the formal logician has to say is, that if facts capable of expression in such and such forms of words are true, another fact whose expression is related in a certain way to the expression of these others is also true.

Hegel taught that ordinary reasoning is "one-sided."\[13\] A part of what he meant was that by such inference a part only of all that is true of an object can be learned, owing to the generality or abstractness of the predicates inferred. This objection is, therefore, somewhat similar to the last; for the point of it is that no number of syllogisms would give a complete knowledge of the object. This, however, presents a difficulty which the other did not; namely, that if nothing incognizable exists, and all knowledge is by mental action, by mental action everything is cognizable. So that if by syllogism everything is not cognizable, syllogism does not exhaust the modes of mental action. But grant the validity of this argument and it proves too much; for it makes, not the syllogism particularly, but all finite knowledge to be worthless. However much we know, more may come to be found out. Hence, all can never be known. This seems to contradict the fact that nothing is absolutely incognizable; and it would really do so if our knowledge were something absolutely limited. For, to say that all can never be known, means that information may increase beyond any assignable point; that is, that an absolute termination of all increase of knowledge is absolutely incognizable, and therefore does not exist. In other words, the proposition merely means that the sum of all that will be known up to any time, however advanced, into the future, has a ratio less than any assignable ratio to all that may be known at a time still more advanced. This does not contradict the fact that everything is cognizable; it only contradicts a proposition, which no one can maintain, that everything will be known at some time some number of years into the future.\[14\] It may, however, very justly be said that the difficulty still
remains, how at every future time, however late, there can be something yet to happen. It is no longer a contradiction, but it is a difficulty; that is to say, lengths of time are shown not to afford an adequate conception of futurity in general; and the question arises, in what other way we are to conceive of it. I might indeed, perhaps, fairly drop the question here, and say that the difficulty had become so entirely removed from the syllogism in particular, that the formal logician need not feel himself specially called on to consider it. The solution, however, is very simple. It is that we conceive of the future, as a whole, by considering that this word, like any other general term, as “inhabitant of St. Louis,” may be taken distributively or collectively. We conceive of the infinite, therefore, not directly or on the side of its infinity, but by means of a consideration concerning words or a second intention.

Another objection to the syllogism is that its “therefore” is merely subjective; that, because a certain conclusion syllogistically follows from a premise, it does not follow that the fact denoted by the conclusion really depends upon the fact denoted by the premise, so that the syllogism does not represent things as they really are. But it has been fully shown that if the facts are as the premises represent, they are also as the conclusion represents. Now this is a purely objective statement: therefore, there is a real connection between the facts stated as premises and those stated as conclusion. It is true that there is often an appearance of reasoning deductively from effects to causes. Thus we may reason as follows:—“There is smoke; there is never smoke without fire: hence, there has been fire.” Yet smoke is not the cause of fire, but the effect of it. Indeed, it is evident, that in many cases an event is a demonstrative sign of a certain previous event having occurred. Hence, we can reason deductively from relatively future to relatively past, whereas causation13 really determines events in the direct order of time. Nevertheless, if we can thus reason against the stream of time, it is because there really are such facts as that “If there is smoke, there has been fire,” in which the following event is the antecedent. Indeed, if we consider the manner in which such a proposition became known to us, we shall find that what it really means is that “If we find smoke, we shall find evidence on the whole that there has been fire”; and this, if reality consists in the agreement that the whole community would eventually come to, is the very same thing as to say that there really has been fire. In short, the whole present difficulty is resolved instantly by this theory of reality, because it makes all reality something which is constituted by an event indefinitely future.

Another objection, for which I am quite willing to allow a great German philosopher the whole credit, is that sometimes the conclusion is false, although both the premises and the syllogistic form are correct. Of this he gives the following examples.16 From the middle term that a wall has been painted blue, it may correctly be concluded that it is blue; but notwithstanding this syllogism it may be green if it has also received a coat of yellow, from which last circumstance by itself it would follow that it is yellow. If from the middle term of the sensuous faculty it be concluded that man is neither good nor bad, since neither can be predicated of the sensuous, the syllogism is correct; but the conclusion is false, since of man in the concrete, spirituality is equally true, and may serve as middle term in an opposite syllogism. From the middle term of the gravitation of the planets, satellites, and comets, towards the sun, it follows correctly that these bodies fall into the sun; but they do not fall into it, because (!) they equally gravitate to their own centres, or, in other words (!!!), they are supported by centrifugal force. Now, does Hegel mean to say that these syllogisms satisfy the rules for syllogism given by those who defend syllogism? or does he mean to grant that they do not satisfy these rules, but to set up some rules of his own for syllogism which shall insure its yielding false conclusions from true premises? If the latter, he ignores the real issue, which is whether the syllogism as defined by the rules of formal logic is correct, and not whether the syllogism as represented by Hegel is correct. But if he means that the above examples satisfy the usual definition of a true syllogism, he is mistaken. The first, stated in form, is as follows:

Whatever has been painted blue is blue;
This wall has been painted blue;
This wall is blue.

Now “painted blue” may mean painted with blue paint, or painted so as to be blue. If, in the example, the former were meant, the major premise would be false. As he has stated that it is true, the latter meaning of “painted blue” must be the one intended. Again, “blue” may mean blue at some time, or blue at this time. If the latter be meant, the major premise is plainly false; therefore, the former is meant. But the conclusion is said to contradict the statement that the wall is yellow. If blue were here taken in the more general sense, there would be no such contradiction. Hence, he means in the conclusion that this wall is now blue; that is to say, he reasons thus:

Whatever has been made blue has been blue;
This has been made blue;
This is blue now.

Now substituting letters for the subjects and predicates, we get the form,

\[ M \equiv P; \]
\[ S \equiv M; \]
\[ \therefore S \equiv Q. \]

This is not a syllogism in the ordinary sense of that term, or in any sense in which anybody maintains that the syllogism is valid.

The second example given by Hegel, when written out in full, is as follows:

Sensuality is neither good nor bad;

\[ \text{Man has (not is) sensuality;} \]
\[ \therefore \text{Man is neither good nor bad.} \]

Or, the same argument may be stated as follows:

The sensuous, as such, is neither good nor bad;

\[ \text{Man is sensuous;} \]
\[ \therefore \text{Man is neither good nor bad.} \]

When letters are substituted for subject and predicate in either of these arguments, it takes the form,

\[ M \equiv P; \]
\[ S \equiv N; \]
\[ \therefore S \equiv P. \]

This, again, bears a very slight resemblance to a syllogism.

The third example, when stated at full length, is as follows:

Whatever tends towards the sun, on the whole, falls into the sun;

\[ \text{The planets tend toward the sun;} \]
\[ \therefore \text{The planets fall into the sun.} \]

This is a fallacy similar to the last.

I wonder that this eminent logician did not add to his list of examples of correct syllogism the following:

It either rains, or it does not rain;

\[ \text{It does not rain;} \]
\[ \therefore \text{It rains.} \]

This is fully as deserving of serious consideration as any of those which he has brought forward. The rainy day and the pleasant day are both, in the first place, day. Secondly, each is the negation of a day. It is indifferent which be regarded as the positive. The pleasant is Other to the rainy, and the rainy is in like manner Other to the pleasant. Thus, both are equally Others. Both are Others of each other, or each is Other for itself. So this day being other than rainy, that to which it is Other is itself. But it is Other than itself. Hence, it is itself Rainy.

Some sophisms have, however, been adduced, mostly by the Eleatics and Sophists, which really are extremely difficult to resolve by syllogistic rules; and according to some modern authors this is actually impossible. These sophisms fall into three classes: 1st, those which relate to continuity; 2nd, those which relate to consequences of supposing things to be other than they are; 3rd, those which relate to propositions which imply their own falsity. Of the first class, the most celebrated are Zeno's arguments concerning motion. One of these is, that if Achilles overtakes a tortoise in any finite time, and the tortoise has the start of him by a distance which may be called \( a \), then Achilles has to pass over the sum of distances represented by the polynomial

\[ \frac{1}{2}a + \frac{1}{4}a + \frac{1}{8}a + \frac{1}{16}a + \cdots. \]

up to infinity. Every term of this polynomial is finite, and it has an infinite number of terms; consequently, Achilles must in a finite time pass over a distance equal to the sum of an infinite number of finite distances. Now this distance must be infinite, because no finite distance, however small, can be multiplied by an infinite number without giving an infinite distance. So that even if none of these finite distances were larger than the smallest (which is finite since all are finite), the sum of the whole would be infinite. But Achilles cannot pass over an infinite distance in a finite time; therefore, he cannot overtake the tortoise in any time, however great.\(^{17}\)

The solution of this fallacy is as follows: The conclusion is dependent on the fact\(^{18}\) that Achilles cannot overtake the tortoise without passing over an infinite number of terms of that series of finite distances. That is, no case of his overtaking the tortoise would be a case of his not passing over a non-finite number of terms; that is, by simple conversion, no case of his not passing over a non-finite number of terms would be a case of his overtaking the tortoise. But if he does not pass over a non-finite number of terms, he either passes over a finite number, or he passes over none; and conversely. Consequently, nothing more has been said than that every case of his passing over only a finite number of terms, or of his not passing over any, is a case of his not overtaking the tortoise. Consequently, nothing more can be concluded than that he passes over a distance greater than the sum of any
finite number of the above series of terms. But because a quantity is greater than any quantity of a certain series, it does not follow that it is greater than any quantity. 19

In fact, the reasoning in this sophism may be exhibited as follows:—We start with the series of numbers,

\[
\begin{align*}
\frac{1}{2}a & \\
\frac{1}{4}a + \frac{1}{4}a & \\
\frac{1}{4}a & \\
\frac{1}{8}a + \frac{1}{8}a + \frac{1}{8}a & \\
\frac{1}{8}a & \\
\end{align*}
\]

&c. &c. &c.

Then, the implied argument is

Any number of this series is less than \( a \);
But any number you please is less than the number of terms of this series;
Hence, any number you please is less than \( a \).

This involves an obvious confusion between the number of terms and the value of the greatest term.

Another argument by Zeno against motion, is that a body fills a space no larger than itself. In that place there is no room for motion. Hence, while in the place where it is, it does not move. But it never is other than in the place where it is. Hence, it never moves. Putting this into form, it will read:

No body in a place no larger than itself is moving;
But every body is a body in a place no larger than itself:

No body is moving.

The error of this consists in the fact that the minor premise is only true in the sense that during a time sufficiently short the space occupied by a body is as little larger than itself as you please. All that can be inferred from this is, that during no time a body will move no distance.

All the arguments of Zeno depend on supposing that a \( \text{continuum} \) has ultimate parts. But a \( \text{continuum} \) is precisely that, every part of which has parts, in the same sense. Hence, he makes out his contradictions only by making a self-contradictory supposition. In ordinary and mathematical language, we allow ourselves to speak of such parts—\( \text{points} \)—and whenever we are led into contradiction thereby, we have simply to express ourselves more accurately to resolve the difficulty.

Suppose a piece of glass to be laid on a sheet of paper so as to cover half of it. Then, every part of the paper is \textit{covered}, or \textit{not covered}; for

“not” means merely outside of, or other than. But is the line under the edge of the glass covered or not? It is no more on one side of the edge than it is on the other. Therefore, it is either on both sides, or neither side. It is not on neither side; for if it were it would be \textit{not} on either side, therefore not on the covered side, therefore not covered, therefore on the uncovered side. It is not partly on one side and partly on the other, because it has no width. Hence, it is wholly on both sides, or both covered and not covered.

The solution of this is, that we have supposed a part too narrow to be partly uncovered and partly covered; that is, a part which has no parts in a continuous surface, which by definition has no such parts. The reasoning, therefore, simply serves to reduce this supposition to an absurdity.

It may be said that there really is such a thing as a line. If a shadow falls on a surface, there really is a division between the light and the darkness. That is true. But it does not follow that because we attach a definite meaning to the part of a surface being covered, therefore we know what we mean when we say that a line is covered. We may define a covered line as one which separates two surfaces both of which are covered, or as one which separates two surfaces \textit{either} of which is covered. In the former case, the line under the edge is uncovered; in the latter case, it is covered.

In the sophisms thus far considered, the appearance of contradiction depends mostly upon an ambiguity; in those which we are now to consider, two true propositions really do in form conflict with one another. We are apt to think that formal logic forbids this, whereas a familiar argument, the \textit{reductio ad absurdum}, depends on showing that contrary predicates are true of a subject, and \textit{that therefore that subject does not exist}. Many logicians, it is true, make affirmative propositions assert the existence of their subjects.* The objection to this is that it cannot be extended to hypotheticals. The proposition

\textbf{If } \( A \) \textbf{then } \( B \)

may conveniently be regarded as equivalent to

\textbf{Every case of the truth of } \( A \) \textbf{is a case of the truth of } \( B \).

But this cannot be done if the latter proposition asserts the existence of its subject; that is, asserts that \( A \) really happens. If, however, a categorical affirmative be regarded as asserting the existence of its subject, the principle of the \textit{reductio ad absurdum} is that two propositions of the forms,

\[ * \text{The usage of ordinary language has no relevancy in the matter.} \]
If $A$ were true, $B$ would not be true,

and

If $A$ were true, $B$ would be true,

may both be true at once; and that if they are so, $A$ is not true. It will be well, perhaps, to illustrate this point. No man of common sense would deliberately upset his inkstand if there were ink in it; that is, if any ink would run out. Hence, by simple conversion,

If he were deliberately to upset his inkstand,

no ink would be spilt.

But suppose there is ink in it. Then, it is also true, that

If he were deliberately to upset his inkstand,

the ink would be spilt.

These propositions are both true, and the law of contradiction is not violated which asserts only that nothing has contradictory predicates: only, it follows from these propositions that the man will not deliberately overturn his inkstand.

There are two ways in which deceptive sophisms may result from this circumstance. In the first place, contradictory propositions are never both true. Now, as a universal proposition may be true when the subject does not exist, it follows that the contradictory of a universal—that is, a particular—cannot be taken in such a sense as to be true when the subject does not exist. But a particular simply asserts a part of what is asserted in the universal over it; therefore, the universal over it asserts the subject to exist. Consequently, there are two kinds of universals, those which do not assert the subject to exist, and these have no particular propositions under them, and those which do assert that the subject exists, and these strictly speaking have no contradictories. For example, there is no use of such a form of proposition as “Some griffins would be dreadful animals,” as particular under the useful form “The griffin would be a dreadful animal”; and the apparent contradictories “All of John Smith’s family are ill,” and “Some of John Smith’s family are not ill,” are both false at once if John Smith has no family. Here, though an inference from a universal to the particular under it is always valid, yet a procedure which greatly resembles this would be sophistical if the universal were one of those propositions which does not assert the existence of its subject. The following sophism depends upon this; I call it the True Gorgias:

Gorgias. What say you, Socrates, of black? Is any black, white?

Socrates. No, by Zeus!
The principle of the reductio ad absurdum also occasions deceptions in another way, owing to the fact that we have many words, such as can, may, must, &c., which imply more or less vaguely an otherwise unexpressed condition, so that these propositions are in fact hypotheticals. Accordingly, if the unexpressed condition is some state of things which does not actually come to pass, the two propositions may appear to be contrary to one another. Thus, the moralist says, "You ought to do this, and you can do it." This "You can do it" is principally hortatory in its force: so far as it is a statement of fact, it means merely, "If you try, you will do it." Now, if the act is an outward one and the act is not performed, the scientific man, in view of the fact that every event in the physical world depends exclusively on physical antecedents, says that in this case the laws of nature prevented the thing from being done, and that therefore, "Even if you had tried, you would not have done it." Yet the reproachful conscience still says you might have done it; that is, that "If you had tried, you would have done it." This is called the paradox of freedom and fate; and it is usually supposed that one of these propositions must be true and the other false. But since, in fact, you have not tried, there is no reason why the supposition that you have tried should not be reduced to an absurdity. In the same way, if you had tried and had performed the action, the conscience might say, "If you had not tried, you would not have done it," while the understanding would say, "Even if you had not tried, you would have done it." These propositions are perfectly consistent, and only serve to reduce the supposition that you did not try to an absurdity.*

*This seems to me to be the main difficulty of freedom and fate. But the question is overlaid with many others. The Necessary laws seem now to maintain that every physical event is completely determined by physical causes (which seems to me irrefragable), than that every act of will is determined by the strongest motive. This has never been proved. Its advocates seem to think that it follows from universal causation, but why need the cause of an act lie within the consciousness at all? If I act from a reason at all, I act voluntarily; but which of two reasons shall appear strongest to me on a particular occasion may be owing to what I have eaten for dinner. Unless there is a perfect regularity as to what is the strongest motive with me, to say that I act from the strongest motive is mere tautology. If there is no calculating how a man will act except by taking into account external facts, the character of his motives does not determine how he acts. Mill and others have, therefore, not shown that a man always acts from the strongest motive. Hobbes maintained that a man always acts from a reflection upon what will please him most. This is a very crude opinion. Men are not always thinking of themselves.

Self-control seems to be the capacity for rising to an extended view of a practical subject instead of seeing only temporary urgency. This is the only freedom of which man has any reason to be proud; and it is because love of what is good for all on the whole, which is the widest possible consideration, is the essence of Christianity, that it is said that the service of Christ is perfect freedom.
not signify as much as this, it signifies nothing, and hence it is not true, and hence another proposition which says of what it says of itself is true. But if the proposition in question signifies something more than that it is itself not true, then the premise that

Whatever is said in the proposition is that it is not true, is not true. And as a proposition is true only if whatever is said in it is true, but is false if anything said in it is false, the first argument on the second side of the dilemma contains a false premise, and the second an undistributed middle. But the first argument on the first side remains good. Hence, if the proposition means more than that it is not true, it is not true, and another proposition which repeats this of it is true. Hence, whether the proposition does or does not mean that it is not true, it is not true, and a proposition which repeats this of it is true.

Since this repeating proposition is true, it has a meaning. Now, a proposition has a meaning if any part of it has a meaning. Hence the original proposition (a part of which repeated has a meaning) has itself a meaning. Hence, it must imply something besides that which it explicitly states. But it has no particular determination to any further implication. Hence, what more it signifies it must signify by virtue of being a proposition at all. That is to say, every proposition must imply something analogous to what this implies. Now, the repetition of this proposition does not contain this implication, for otherwise it could not be true; hence, what every proposition implies must be something concerning itself. What every proposition implies concerning itself must be something which is false of the proposition now under discussion, for the whole falsity of this proposition lies therein, since all that it explicitly lays down is true. It must be something which would not be false if the proposition were true, for in that case some true proposition would be false. Hence, it must be that it is itself true. That is every proposition asserts its own truth.

The proposition in question, therefore, is true in all other respects but its implication of its own truth.*

The difficulty of showing how the law of deductive reasoning is true depends upon our inability to conceive of its not being true. In the case of probable reasoning the difficulty is of quite another kind; here, where we see precisely what the procedure is, we wonder how such a process can have any validity at all. How magical it is that by examining a part of a class we can know what is true of the whole of the class, and by study of the past can know the future; in short, that we can know what we have not experienced.

Is not this an intellectual intuition? Is it not that besides ordinary experience which is dependent on there being a certain physical connection between our organs and the thing experienced, there is a second avenue of truth dependent only on there being a certain intellectual connection between our previous knowledge and what we learn in that way? Yes, this is true. Man has this faculty, just as opium has a soporific virtue; but some further questions may be asked, nevertheless. How is the existence of this faculty accounted for? In one sense, no doubt, by natural selection. Since it is absolutely essential to the preservation of so delicate an organism as man's, no race which had it not has been able to sustain itself. This accounts for the prevalence of this faculty, provided it was only a possible one. But how can it be possible? What could enable the mind to know physical things which do not physically influence it and which it does not influence? The question cannot be answered by any statement concerning the human mind, for it is equivalent to asking what makes the facts usually to be, as inductive and hypothetic conclusions from true premises represent them to be? Facts of a certain kind are usually true when facts having certain relations to them are true; what is the cause of this? That is the question.

The usual reply is that nature is everywhere regular as things have been, so they will be; as one part of nature is, so is every other. But this explanation will not do. Nature is not regular. No disorder would be less orderly than the existing arrangement. It is true that the special laws and regularities are innumerable; but nobody thinks of the irregularities, which are infinitely more frequent. Every fact true of any one thing in the universe is related to every fact true of every other. But the immense majority of these relations are fortuitous and irregular. A man in China bought a cow three days and five minutes after a Greenlander had sneezed. Is that abstract circumstance connected with any regularity whatever? And are not such relations infinitely more frequent than those which are regular? But if a very large number of qualities were to be distributed among a very large number of things in almost any way, there would chance to be some few regularities. Ie, for example, upon a checker-board of an enormous number of squares, painted all sorts of colors, myriads of dice were to be thrown, it could hardly fail to happen, that upon some color, or shade of color,
out of so many, some one of the six numbers should not be uppermost on any die. This would be a regularity; for, the universal proposition would be true that upon that color that number is never turned up. But suppose this regularity abolished, then a far more remarkable regularity would be created, namely, that on every color every number is turned up. Either way, therefore, a regularity must occur. Indeed, a little reflection will show that although we have here only variations of color and of the numbers of the dice, many regularities must occur. And the greater the number of objects, the more respects in which they vary, and the greater the number of varieties in each respect, the greater will be the number of regularities. Now, in the universe, all these numbers are infinite. Therefore, however disorderly the chaos, the number of regularities must be infinite. The orderliness of the universe, therefore, if it exists, must consist in the large proportion of relations which present a regularity to those which are quite irregular. But this proportion in the actual universe is, as we have seen, as small as it can be; and, therefore, the orderliness of the universe is as little as that of any arrangement whatever.

But even if there were such an orderliness in things, it never could be discovered. For it would belong to things either collectively or distributively. If it belonged to things collectively, that is to say, if things formed a system the difficulty would be that a system can only be known by seeing some considerable proportion of the whole. Now we never can know how great a part of the whole of nature we have discovered. If the order were distributive, that is, belonged to all things only by belonging to each thing, the difficulty would be that a character can only be known by comparing something which has it with something which has it not. Being, quality, relation, and other universals are not known except as characters of words or other signs, attributed by a figure of speech to things. Thus, in neither case could the order of things be known. But the order of things would not help the validity of our reasoning—that is, would not help us to reason correctly—unless we knew what the order of things required the relation between the known reasoned from to the unknown reasoned to, to be.

But even if this order both existed and were known, the knowledge would be of no use except as a general principle, from which things could be deduced. It would not explain how knowledge could be increased (in contradistinction to being rendered more distinct), and so it would not explain how it could itself have been acquired.

Finally, if the validity of induction and hypothesis were dependent on a particular constitution of the universe, we could imagine a universe in which these modes of inference should not be valid, just as we can imagine a universe in which there would be no attraction, but things should merely drift about. Accordingly, J. S. Mill, who explains the validity of induction by the uniformity of nature, maintains that he can imagine a universe without any regularity, so that no probable inference would be valid in it. In the universe as it is, probable arguments sometimes fail, nor can any definite proportion of cases be stated in which they hold good; all that can be said is that in the long run they prove approximately correct. Can a universe be imagined in which this would not be the case? It must be a universe where probable argument can have some application, in order that it may fail half the time. It must, therefore, be a universe experienced. Of the finite number of propositions true of a finite amount of experience of such a universe, no one would be universal in form, unless the subject of it were an individual. For if there were a plural universal proposition, inferences by analogy from one particular to another would hold good invariably in reference to that subject. So that these arguments might be no better than guesses in reference to other parts of the universe, but they would invariably hold good in a finite proportion of it, and so would on the whole be somewhat better than guesses. There could, also, be no individuals in that universe, for there must be some general class—that is, there must be some things more or less alike—or probable argument would find no premises there; therefore, there must be two mutually exclusive classes, since every class has a residue outside of it; hence, if there were any individual, that individual would be wholly excluded from one or other of these classes. Hence, the universal plural proposition would be true, that no one of a certain class was that individual. Hence, no universal proposition would be true. Accordingly, every combination of characters would occur in such a universe. But this would not be disorder, but the simplest order; it would not be unintelligible, but, on the contrary, everything conceivable would be found in it with equal frequency. The notion, therefore, of a universe in which probable arguments should fail as often as hold true, is absurd. We can suppose it in general terms, but we cannot specify how it should be other than self-contradictory.
Since we cannot conceive of probable inferences as not generally holding good, and since no special supposition will serve to explain their validity, many logicians have sought to base this validity on that of deduction and that in a variety of ways. The only attempt of this sort, however, which deserves to be noticed is that which seeks to determine the probability of a future event by the theory of probabilities, from the fact that a certain number of similar events have been observed. Whether this can be done or not depends on the meaning assigned to the word probability. But if this word is to be taken in such a sense that a form of conclusion which is probable is valid; since the validity of an inference (or its correspondence with facts) consists solely in this, that when such premises are true, such a conclusion is generally true, then probability can mean nothing but the ratio of the frequency of occurrence of a specific event to a general one over it. In this sense of the term, it is plain that the probability of an inductive conclusion cannot be deduced from the premises; for from the inductive premises

\[ S', S'', S''' \text{ are } M, \]
\[ S', S'', S''' \text{ are } P, \]

nothing follows deductively, except that any \( M \), which is \( S' \), or \( S'' \), or \( S''' \) is \( P \); or, less explicitly, that some \( M \) is \( P \).

Thus, we seem to be driven to this point. On the one hand, no determination of things, no fact, can result in the validity of probable argument; nor, on the other hand, is such argument reducible to that form which holds good, however the facts may be. This seems very much like a reduction to absurdity of the validity of such reasoning; and a paradox of the greatest difficulty is presented for solution.

There can be no doubt of the importance of this problem. According to Kant, the central question of philosophy is “How are synthetic judgments a priori possible?” But antecedently to this comes the question how synthetic judgments in general, and still more generally, how synthetic reasoning is possible at all. When the answer to the general problem has been obtained, the particular one will be comparatively simple. This is the lock upon the door of philosophy.

All probable inference, whether induction or hypothesis, is inference from the parts to the whole. It is essentially the same, therefore, as statistical inference. Out of a bag of black and white beans I take a few handfuls, and from this sample I can judge approximately the proportions of black and white in the whole. This is identical with induction. Now we know upon what the validity of this inference depends. It depends upon the fact that in the long run, any one bean would be taken out as often as any other. For were this not so, the mean of a large number of results of such testings of the contents of the bag would not be precisely the ratio of the numbers of the two colors of beans in the bag. Now we may divide the question of the validity of induction into two parts: 1st, why of all inductions, premises for which occur, the generality should hold good, and 2d, why men are not fated always to light upon the small proportion of worthless inductions. Then, the first of these two questions is readily answered. For since all the members of any class are the same as all that are to be known, and since from any part of those which are to be known an induction is competent to the rest, in the long run any one member of a class will occur as the subject of a premise of a possible induction as often as any other, and, therefore, the validity of induction depends simply upon the fact that the parts make up and constitute the whole. This in its turn depends simply upon there being such a state of things that any general terms are possible. But it has been shown, p. 52, that being at all is being in general. And thus this part of the validity of induction depends merely on there being any reality.

From this it appears that we cannot say that the generality of inductions are true, but only that in the long run they approximate to the truth. This is the truth of the statement, that the universality of an inference from induction is only the analogue of true universality. Hence, also, it cannot be said that we know an inductive conclusion to be true, however loosely we state it; we only know that by accepting inductive conclusions, in the long run our errors balance one another. In fact, insurance companies proceed upon induction;—they do not know what will happen to this or that policy-holder; they only know that they are secure in the long run.

The other question relative to the validity of induction, is why men are not fated always to light upon those inductions which are highly deceptive. The explanation of the former branch of the problem we have seen to be that there is something real. Now, since if there is anything real, then (on account of this reality consisting in the ultimate agreement of all men, and on account of the fact that reasoning from parts to whole is the only kind of synthetic reasoning which men possess) it follows necessarily that a sufficiently long succession of inductions from parts to whole will lead men to a knowledge of it, so that in that case they cannot be fated on the whole to be thoroughly unlucky in their inductions. This second branch of the problem is in fact equivalent to asking why there is anything real, and thus its solution will carry the solution of the former branch one step further.

The answer to this question may be put into a general and abstract, or a special detailed form. If men were not to be able to learn from induction, it must be because as a general rule, when they made...
an induction, the order of things (as they appear in experience), would then undergo a revolution. Just herein would the unreality of such a universe consist; namely, that the order of the universe should depend on how much men should know of it. But this general rule would be capable of being itself discovered by induction; and so it must be a law of such a universe, that when this was discovered it would cease to operate. But this second law would itself be capable of discovery. And so in such a universe there would be nothing which would sooner or later be known; and it would have an order capable of discovery by a sufficiently long course of reasoning. But this is contrary to the hypothesis, and therefore that hypothesis is absurd. This is the particular answer. But we may also say, in general, that if nothing real exists, then, since every question supposes that something exists—for it maintains its own urgency—it supposes only illusions to exist. But the existence even of an illusion is a reality; for an illusion affects all men, or it does not. In the former case, it is a reality according to our theory of reality; in the latter case, it is independent of the state of mind of any individuals except those whom it happens to affect. So that the answer to the question, Why is anything real? is this: That question means, "supposing anything to exist, why is something real?" The answer is, that that very existence is reality by definition.

All that has been said, particularly of induction, applies to all inference from parts to whole, and therefore to hypothesis, and so to all probable inference.

Thus, I claim to have shown, in the first place, that it is possible to hold a consistent theory of the validity of the laws of ordinary logic. But now let us suppose the idealistic theory of reality which I have in this paper taken for granted to be false. In that case, inductions would not be true unless the world were so constituted that every object should be presented in experience as often as any other; and further, unless we were so constituted that we had no more tendency to make false inductions than good ones. These facts might be explained by the benevolence of the Creator; but, as has already been argued, they could not explain, but are absolutely refuted by the fact that no state of things can be conceived in which probable arguments should not lead to the truth. This affords a most important argument in favor of that theory of reality, and thus of those denials of certain faculties from which it was deduced, as well as of the general style of philosophizing by which those denials were reached.

Upon our theory of reality and of logic, it can be shown that no inference of any individual can be thoroughly logical without certain determinations of his mind which do not concern any one inference immediately; for we have seen that that mode of inference which alone can teach us anything, or carry us at all beyond what was implied in our premises—in fact, does not give us to know any more than we knew before; only, we know that by faithfully adhering to that mode of inference, we shall, on the whole, approximate to the truth. Each of us is an insurance company, in short. But, now, suppose that an insurance company, among its risks, should take one exceeding in amount the sum of all the others. Plainly, it would then have no security whatever. Now, has not every single man such a risk? What shall it profit a man if he shall gain the world and lose his own soul? If a man has a transcendent personal interest infinitely outweighing all others, then, upon the theory of validity of inference just developed, he is devoid of all security, and can make no valid inference whatever. What follows? That logic rigidly requires, before all else, that no determinate fact, nothing which can happen to a man's self, should be of more consequence to him than every other fact. He who would not sacrifice his own soul to save the whole world, is illogical in all his inferences, collectively. So the social principle is rooted intrinsically in logic.

That being the case, it becomes interesting to inquire how it is with men as a matter of fact. There is a psychological theory that man cannot act without a view to his own pleasure. This theory is based on a falsely assumed subjectivism. Upon our principles of the objectivity of knowledge, it could not be based, and if they are correct it is reduced to an absurdity. It seems to me that the usual opinion of the selfishness of man is based in large measure upon this false theory. I do not think that the facts bear the usual opinion. The immense self-sacrifices which the most willful men often make, show that willfulness is a very different thing from selfishness. The care that men have for what is to happen after they are dead, cannot be selfish. And finally and chiefly, the constant use of the word "we"—as when we speak of our possessions on the Pacific—our destiny as a republic—in cases in which no personal interests at all are involved, show conclusively that men do not make their personal interests their only ones, and therefore may, at least, subordinate them to the interests of the community.

But just the revelation of the possibility of this complete self-sacrifice in man, and the belief in its saving power, will serve to redeem the logicality of all men. For he who recognizes the logical necessity of complete self-identification of one's own interests with those of the community, and its potential existence in man, even if he has not himself, will perceive that only the inferences of that man who has it are logical, and so views his own inferences as being valid only so far as they would be accepted by that man. But so far as he has this belief, he becomes identified with that man. And that ideal perfection of knowledge by which we have seen that reality is constituted must thus belong to a community in which this identification is complete.

This would serve as a complete establishment of private logicality were it not that the assumption that man or the community (which
may be wider than man) shall ever arrive at a state of information greater than some definite finite information, is entirely unsupported by reasons. There cannot be a scintilla of evidence to show that at some time all living beings shall not be annihilated at once, and that forever after there shall be throughout the universe any intelligence whatever. Indeed, this very assumption involves itself a transcendent and supreme interest, and therefore from its very nature is unsusceptible of any support from reasons. This infinite hope which we all have (for even the atheist will constantly betray his calm expectation that what is Best will come about) is something so august and momentous, that all reasoning in reference to it is a trifling impertinence. We do not want to know what are the weights of reasons pro and con—that is, how much odds we should wish to receive on such a venture in the long run—because there is no long run in the case; the question is single and supreme, and all is at stake upon it. We are in the condition of a man in a life and death struggle; if he have not sufficient strength, it is wholly indifferent to him how he acts, so that the only assumption upon which he can act rationally is the hope of success. So this sentiment is rigidly demanded by logic. If its object were any determinate fact, any private interest, it might conflict with the results of knowledge and so with itself; but when its object is of a nature as wide as the community can turn out to be, it is always a hypothesis uncontradicted by facts and justified by its indispensableness for making any action rational.