3. Law as Living Power

It would not be inappropriate to say that for Peirce the notion of thought as a living force in the world sums up his notion of law, and that thought as living force in the world is nothing other than real potentiality or power, the ground for laws of nature. In more than one place he explicitly says just that. For example, in working out a detailed classification of the sciences (ca. 1902), he argues that “the idea of right and wrong is” (like Truth) the “greatest power on earth, to which every knee must sooner or later bow or be broken down” (1.217). Nor do these master ideas get their life and power from powerful men who are disposed to make them so, rather “it is the idea which will create its defenders and render them powerful” (1.217).¹ In yet another place, he says:

Whatever one’s theory may be as to the invalidity of human reason, there are certain cases where the force of conviction practically cannot be resisted; and one of these is the experience that one opinion is so far from being as strong as another in the long run, though it receives equally warm support, that on the contrary, ideas utterly despised and frowned upon have an inherent power of working their way to the governance of the world, at last. True, they cannot do this without machinery, without supporters, without facts; but the ideas somehow manage to grow their machinery, and their supporters, and their facts, and to render the machinery, the supporters, and the facts strong. As intellectual development proceeds, we all come to believe this more or less. Most of us, such is the depravity of the human heart, look askance at the notion that ideas have any power; although that some power they have we cannot but admit. (2.149)

Peirce argues that even if one does not accept this opinion, one must see that it is perfectly intelligible (1.217). Not only does he himself subscribe to this belief (1.219), but he is willing to defend "the extreme position that every general idea has more or less power of working itself out into fact..." (2.149). Whether or not he be correct in this "extreme position"

... it must at any rate be admitted by every candid man that he does believe firmly and without doubt that to some extent phenomena are regular, that is, are governed by general ideas; and so far as they are so, they are capable of prediction by reasoning. (2.149)

Ideas, then, have "generative life" (1.219); they are real laws governing events.

That something like this is so, Peirce maintains, is a matter of experiential fact. But it is not the sort of factual claim that can be verified "by producing a microscope or telescope or any recondite observations of any kind" (1.219). Its evidence, he says, stares us all in the face every hour of our lives. It is, then, the type of factual question with which philosophy, not physical science, deals. The fact is there in front of us, but we must open our eyes to see it and then try to understand it.

If one does not see it, it is for the same reason that some men have not a sense of sin; and there is nothing for it but to be born again and become as a little child. If you do not see it, you have to look upon the world with new eyes. (1.219)

Indeed, if anyone were to deny that ideas have power to work out physical and psychical results, it would be a sufficient refutation to point out that the denial involves a belief in that very same proposition. After all, any controversy, or more generally any communication, involves an interchange of ideas and these ideas produce effects on the parties, in their thinking or acting.

Words then do produce physical effects. It is madness to deny it. The very denial of it involves a belief in it; and nobody can consistently fail to acknowledge it until he sinks to a complete mental paresis. (5.106)
The fact is beyond any doubt; the question to be answered is "how?" Peirce will offer his own "guess" (5.106).

Peirce felt obliged to explain in detail his unusual and controversial position. The main question to be answered was the nature of thought's efficacy or power to work itself out in the world and thus "transform the face of the earth" (1.217). In more traditional terms, the question was what sort of causality do ideas exercise. Peirce turns to tradition for the answer—to Aristotle's distinction between final and efficient causation (cf. 1.211 ff.). Peirce had been arguing that a "natural" or "real" class (an efficacious idea or law) is one "the existence of whose members is due to a common and peculiar final cause" (1.211). Ideas have their power by exercising final causality. Now the term "final cause" must not be limited to purpose. Rather, purpose is but one type of final cause—more familiar in our human experience because human purpose is conscious and controlled. But an idea—a thought as opposed to thinking—is not necessarily confined to a consciousness, to a brain, to a soul (1.216, cf. 1.211). Final causation, therefore, means simply

... that mode of bringing facts about according to which a general description of result is made to come about, quite irrespective of any compulsion for it to come about in this or that particular way; although the means may be adapted to the end. The general result may be brought about at one time in one way, and at another in another way. Final causation does not determine in what particular way it is to be brought about, but only that the result shall have a certain general character. (1.211)

In scholastic terminology, the final cause specifies the effect an agent or efficient cause produces, that is, determines it to be of a certain kind. Again, since the means must be adapted to the end, the end specifies what means are appropriate in a general, not necessarily in a particular, way. Efficient causation, on the other hand,

... is a compulsion determined by the particular condition of things, and is a compulsion acting to make that situation

2 See e.g. Summa Theologica I–II, q. 1, a. 2; Summa Contra Gentiles, III, 2, Item 2.
begin to change in a perfectly determinate way; and what
the general character of the result may be in no way concerns
the efficient causation. (1.212)

The efficient cause, then, is what produces the effect by its own activity
or action, *hic et nunc*, in these particular and determinate circum­
cstances. The efficiency as such has nothing general about it. It is brute
force, or compulsion. Thus in terms of Peirce's categories, what char­
acterizes final causation is Thirdness and what characterizes efficient
causation is Secondness.

To say that efficient and final causation are distinct and indeed
irreducible is not to say that they are separable. ³ Peirce tells us
explicitly:

Final causality cannot be imagined without efficient
causality; but no whit the less on that account are their modes
of action polar contraries. (1.213)

We are beginning to get some insight into what Peirce means when
he continually insists that there can be no law without cases under the
law—there can be no true generals without instances, and so on. His
favorite illustration of the intimate connection between final and
efficient causality, between law and force, between Thirdness and
Secondness generally, is the relation between the court and the sheriff.

Law, without force to carry it out, would be a court without
a sheriff; and all its dicta would be vaporings. (1.212)

The court cannot be imagined without a sheriff. . . . The
sheriff would still have his fist, even if there were no court;
but an efficient cause, detached from a final cause in the form
of a law, would not even possess efficiency: it might exert
itself, and something might follow *post hoc*, but not *propter
hoc*; for *propter* implies potential regularity. (1.213)

. . . a law of nature left to itself would be quite analogous to
a court without a sheriff. A court in that predicament might
probably be able to induce some citizen to act as sheriff;
but until it had so provided itself with an officer who, unlike
itself, could not discourse authoritatively but who could put

³ See the discussion of Peirce's theory of distinctions in Part I.
forth the strong arm, its law might be the perfection of human reason but would remain mere fireworks, *brutum fulmen.* (5.48)

A reaction cannot be generalized without entirely losing its character as a reaction. A generalized reaction is a law. But a law, by itself without the addition of a living reaction to carry it out on each separate occasion, is as impotent as a judge without a sheriff. It is an idle formula entirely different from a reaction. A reaction may be ever so conformable to law or reason, that is, it may occur when law or reason calls for it. But in itself, as reaction it is arbitrary, blind, and brute exertion of force. (7.532)

Generally speaking genuine secondness consists in one thing acting upon another,—brute action. I say brute, because so far as the idea of any law or reason comes in, Thirdness comes in. When a stone falls to the ground, the law of gravitation does not act to make it fall. The law of gravitation is the judge upon the bench who may pronounce the law until doomsday, but unless the strong arm of the law, the brutal sheriff, gives effect to the law, it amounts to nothing. True, the judge can create a sheriff if need be; but he must have one. The stone's falling is purely the affair of the stone and the earth at the time. (8.330)

The Court takes authoritative decisions; the sheriff carries them out. The Court guides and directs; the sheriff does and acts. Together they achieve order and maintain the peace; separated, the one is impotent, the other brutal. Indeed neither Court nor sheriff are imaginable except in reference one to another and yet they and their activity ever remain clearly distinct. So it is with efficient and final causation (cf. 1.213).  

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4 Every analogy limps. So does this one and Peirce of course knew it. The weak point is this: a court must make practical judgments of conscience with the theoretical judgments of rationality. "Conscience is like our Supreme Court, which intends to frame its decisions according to the principles of law. But when it has decided a point, its decision becomes law, whether the wisest counsels would have maintained it or not. For the actual law consists in that which the court's officers will sustain. But according to
To put the relation between final and efficient causality in another way, we might say that

Efficient causation is that kind of causation whereby the parts compose the whole; final causation is that kind of causation whereby the whole calls out its parts. (1.220)

Peirce gives this illustration. If you took a corpse and dissected it very carefully, separated all the various systems of the anatomy and hung them in a cabinet, one superimposed over the other, so that each appeared to be in its proper place, this would be a very instructive specimen, but nobody would dream of calling it a man (1.220). What is missing is the final causation, the unity of parts, “which is what characterizes the definitum” (1.220). Final causation is what organizes the parts in a particular way, what gives them life and direction. Final causation is more than the mere sum of the parts—merely putting back all the dissected members of the corpse does not yield the man, (nor the corpse for that matter!). Thus, while final causation without efficient causation is helpless,

Efficient causation without final causation . . . is worse than helpless, by far; it is mere chaos; and chaos is not even so much as chaos, without final causation; it is blank nothing. (1.220)

Thus an idea (a natural class) is a vera causa, a power conferring existence upon its instances, not in the sense that it creates new matter (for “blind force is an element of experience distinct from rationality, or logical force” 1.220) but in the sense that it confers upon the instances a direction, an intelligibility, a power of working out results in the world, an organic existence, life (1.220).

the English logicians it is otherwise with rationality” (2.153). For Peirce, then, making a practical decision has an element of the arbitrary about it which is out of place in theoretical inquiry. There is a “fiat” involved which enters into the legislation itself. Thus conscience must decide how we are to act here and now, granted all the limitations here and now of our knowledge of principle and of fact. It must say “yes” or “no”; it must decide and that decision is final. This sense of “law,” the decision of conscience, is characterized chiefly by Secondness. This is not the same as “law of nature” since nature’s laws do not depend upon our fiat; we discover them and submit to them; we do not make them. Cf. 1.55.
The doctrine that natural or "real" classes are constituted by their members all having the same final cause is closely connected with Peirce's conception of pragmatism. We saw that the pragmatic maxim is in the first instance a logical or semantical maxim. It tells us how to make our ideas clear. It is a way to get at meaning. But meaning is an idea's "intellectual purport" and intellectual purport has to do with "purpose," "intention," final cause. Thus the pragmatic maxim has to do with the normative—with what our ideas ought to mean (or perhaps more accurately, with how we ought to determine what they do mean). In this connection it is important to point out the connection Peirce sees between definition and the discovery of natural classes. The question is whether it is the definition which determines what the class shall be or whether something else (final cause) determines what the definition shall be. The first alternative is that taken by nominalists; according to it any one class is as "natural" or "real" as another, because every class has a defining character, and of course every member of that class must have that character. Furthermore, any collection of objects whatsoever has some characteristic in common, and so any collection of objects, no matter how heterogeneous, could be made members of a natural or real class. This position is the denial of real or natural classes altogether, since absolutely every class would be real or natural. Peirce adopts the second alternative: find the natural classes first through an investigation into their respective common final causes and then define them. The pragmatic maxim will aid in this sort of investigation by directing our attention to the sort of consequences that might conceivably result from an idea, and those results reveal its finality. Strictly speaking the maxim does not yield an abstract definition but "intellectual purport."

So then, a natural class being a family whose members are the sole offspring and vehicles of one idea, from which they derive their peculiar faculty, to classify by abstract definitions is simply a sure means of avoiding a natural classification. I am not decrying definitions. . . . I only say that it should not be by means of definitions that one should seek to find natural classes. When the classes have been found, then it is proper to try to define them; and one may even, with great caution and reserve, allow the definitions to lead us to
turn back and see whether our classes ought not to have their boundaries differently drawn. After all, boundary lines in some cases can only be artificial, although the classes were natural . . . When one can lay one's finger upon the purpose to which a class owes its origin, then indeed abstract definition may formulate that purpose. But when one cannot do that, but one can trace the genesis of a class and ascertain how several have been derived by different lines of descent from one less specialized form, this is the best route toward an understanding of what the natural classes are. This is true even in biology; it is much more clearly so when the objects generated are, like sciences, themselves of the nature of ideas. (1.222)

Commentators⁵ have pointed out that the pragmatic maxim so understood is very similar to the scholastic maxim, *agere sequitur esse*. This principle was understood to have a double thrust. As a maxim of investigation it meant that the way to know what a thing is, how it is structured, is to observe how it acts. The real potentialities of a thing are manifested in its activity. On the basis of this principle the scholastics, too, specified “real” or “natural” classes or “natures.” As an ontological theorem it meant that a thing can act only in accordance with its structure or nature. Its being specifies its activity. Peirce’s only objection to this principle is that the scholastics, due to their limited logic, thought of the dispositional structure of a being in terms of substantial forms instead of in terms of relations.⁶

The type of causation, therefore, exercised by laws as opposed to “forces,” is final and not efficient. But final causation is logical causation, the causation of mind (1.250).

Mind has its universal mode of action, namely, by final causation. The microscopist looks to see whether the motions of a little creature show any purpose. If so, there is mind there. Passing from the little to the large, natural selection is the theory of how forms come to be adaptive, that is, to be governed by a *quasi* purpose. It suggests a machinery of

⁵ E.g. Boler, *op. cit.*, p. 102.
efficiency to bring about the end—a machinery inadequate perhaps—yet which must contribute some help toward the result. But the being governed by a purpose or other final cause is the very essence of the psychical phenomenon, in general. (1.269)

Thus in the concluding paragraph of an undated fragment in which Peirce was striving to classify ends, he writes:

... there have been three grand classes of rationalistic moralists who have differed from one another upon the much more important question of the mode of being of the end. Namely, there have been those who have made the end purely subjective, a feeling of pleasure; there have been those who have made the end purely objective and material, the multiplication of the race; and finally there have been those who have attributed to the end the same kind of being that a law of nature has, making it lie in the rationalization of the universe. (1.590, emphasis added)

Peirce, of course, identifies himself with the last group, but what is of immediate interest is that he identifies the nature of law with the nature of end or final cause. Therefore, wherever there is law, regularity, real potentiality, there is mind, reason, rationality. And once again, for Peirce, mind, reason, rationality, do not necessarily suppose consciousness. So he can say that logic need not suppose that there is consciousness (2.66). All it is obliged to suppose is that there is knowledge embodied in some form (a thought thought) and inference, in the sense that one embodiment of knowledge affects another (2.66). Under these conditions all its rules hold good. Thus

the essence of rationality lies in the fact that the rational being will act so as to attain certain ends. Prevent his doing so in one way, and he will act in some utterly different way which will produce the same result. Rationality is being governed by final causes. (2.66)

Indeed, for Peirce, since consciousness is in itself only a quality of feeling, it has no room for rationality. And the notion that logic is in
any way concerned with it “is a fallacy closely allied to hedonism in ethics.”

True laws of nature, we have seen, belong to the category of Thirdness and as such are manifestations of the presence of mind or reason in the world of our experience. Laws are living ideas which have force and power to work themselves out in the cosmos. It is this conviction which as a matter of fact motivates men of science in their arduous research. Peirce has explained that the type of causation proper to reason and law is final—that of a type or form or ideal—which, of course, to be effective needs some mechanism of efficient causation, and therefore the very being of law is to govern actual

7 See the discussion of hedonism in Part I. The point of the comparison is this: just as it is a mistake to think that the feeling of pleasure or pain which accompanies some moral act constitutes that act's rightness or wrongness, so too it is a mistake to think that the awareness we have of an argument's validity or invalidity constitutes that validity or invalidity. The point is directed against those logicians who would make logic rest upon a feeling or instinct for what is sound and what is unsound reasoning. Of course, in another sense of “reasoning” Peirce will admit that control is an essential ingredient and that consciousness is required for such control. Cf. 2.148, 2.169 ff., 2.179 ff. for discussion of “expectation” in reasoning. Thus man is the “reasoner” par excellence since his power of critical review and of self-control is more highly developed than in any other animal we know. Cf. 5.85-87.

8 “The man of science has received a deep impression of the majesty of truth, as that to which, sooner or later, every knee must bow. He has further found that his own mind is sufficiently akin to that truth, to enable him, on condition of submissive observation, to interpret it in some measure. As he gradually becomes better and better acquainted with the character of cosmical truth, and learns that human reason is its issue and can be brought step by step into accord with it, he conceives a passion for its fuller revelation. He is keenly aware of his own ignorance, and knows that personally he can make but small steps in discovery. Yet, small as they are, he deems them precious; and he hopes that by conscientiously pursuing the method of science he may erect a foundation upon which his successors may climb higher. This, for him, is what makes life worth living and what makes the human race worth perpetuation. The very being of law, general truth, reason—call it what you will—consists in its expressing itself in a cosmos and in intellects which reflect it, and in doing this progressively; and that which makes progressive creation worth doing—so the researcher comes to feel—is precisely the reason, the law, the general truth for the sake of which it takes place” (8.136).
events. The question now arises: just how, in detail, does this final causation work; how does it govern actual cases; how is it ingredient in events? Peirce faced this question in a brilliant essay, “Ideals of Conduct,” read as part of the 1903 Lowell Lectures.

Directly, this paper examines only deliberate human action or conduct and so only analyzes one kind of final cause, the one “most familiar in our experience,” human purpose. In particular, then, the question is how human purpose enters into human activity in such a way as to make it controlled or reasoned action. In virtue of the doctrine of continuity, however, Peirce will try to extend the results of his analysis to other levels of reality where mind or reason is embodied in other forms. Peirce was aware that this sort of analysis is open to the criticism of being anthropomorphic. He knew that objectors would allege that he was reading things into the data which are proper only to his own experience as a man. Peirce considers this objection explicitly in several places. He says that to say an hypothesis is unscientific because it is “anthropomorphic” is an objection “of a very shallow kind, that arises from prejudices based upon much too narrow considerations” (5.47). In fact, he maintains, almost all human conceptions are at bottom anthropomorphic. What else would we or could we expect them to be? All man’s knowledge is based upon his experience. How else could he elaborate a theory or an hypothesis except in those terms? There is no way for man to peek outside of his own experiencing-apparatus to get a look at “things-in-themselves.”

I hold . . . that man is so completely hemmed in by the bounds of his possible practical experience, his mind is so restricted to being the instrument of his needs, that he cannot, in the least, mean anything that transcends those limits. (5.536)

The limits of his possible practical experience insure that all his conceptions will be “anthropomorphic” in some sense. As he says, one might just as well pass a law forbidding man to jump over the moon. Such a law, however, would not prevent him from jumping as high as he could. So too man cannot have an idea of any cause or agency so stupendous that there would be any more adequate way of conceiving it than as vaguely like a man. Furthermore, Peirce recalls that the only satisfactory explanation of man’s ability to form any hypothesis
and so make any scientific discovery is man's affinity to the universe.

And in regard to any preference for one kind of theory over another, it is well to remember that every single truth of science is due to the affinity of the human soul to the soul of the universe, imperfect as that affinity no doubt is. To say, therefore, that a conception is one natural to man, which comes to just about the same thing as to say that it is anthropomorphic, is as high a recommendation as one could give to it in the eyes of an Exact Logician. (5.47)

Let us, then, begin with what might be called the prime analogue of mind's embodiments, conscious human reason, governing, controlling, and guiding conduct.

Peirce begins his analysis with the matter-of-fact claim that all men have some idea about the sort of conduct which befits a rational animal in his particular circumstances. Men have some vague notion at least of "what most accords with his total nature and relations" (1.591). *Natura humana complete spectata*, as the scholastics following Aristotle would say, is for Peirce too in some sense the material norm of human conduct. Again, by inductive generalization, Peirce remarks that the ideals of conduct culled from this sort of reflection upon one's nature and condition usually and rightly recommend themselves in three ways: (1) they have a certain esthetic quality about them, a certain fittingness and proportion, which makes us judge them "fine"; (2) they must be consistent with each other; and (3) they must be seen to lead to consequences which, if fully carried out, are desirable (1.591). Ideals of conduct, then, must submit to a triple criterion: esthetic, logical, and pragmatic. Failure to live up to any of them indicates that the ideals do not in fact conform to man's total nature and relations.

These ideals, final causes, laws of conduct, however, are not innate ideas⁹ nor intuitions nor even, in the beginning anyway, conclusions based on experience. In the beginning they are learned from parents

⁹ They are not innate in respect to their particular content, although, as we shall see, there are innate cognitive powers or potentialities which must be informed and developed by habits acquired through experience. In other words, what is innate is a structure or natural disposition to take habits and, in conscious beings, to control those taken. Cf. 5.504.
or guardians. As the child develops his own personality, through growing awareness of himself and his environment, he gradually begins to interiorize these ideals, to make them his own and to shape them to his own situation. In other words, he begins to reflect upon the ideals he has learned and to intend to conform his conduct to at least part of them. He makes this intention articulate and explicit by formulating rules of conduct. Since his reflection is not external to himself but rather the exercise of his natural powers and dispositions, that activity has in turn an effect upon his dispositions. They are modified and moulded by the ideals upon which he reflects. In the course of these reflections he will consider possible future situations in which he will have to act and in which he ought to act in accordance with the disposition such as it has been formed in him through his reflections. Thus he gathers his inner forces and resolves so to act when the occasion arises. He makes his plan. Still, resolve, in this sense of a plan, is not enough in itself to assure that he will as a matter of fact act upon it. He has to work the resolve into his muscles, as it were. He has to convert it into determination or real efficient agency "such that if one knows what its special character is, one can forecast the man's conduct on the special occasion" (1.592). Thus the ideal of conduct through reflection is made into a real power or potentiality which could be the ground for prediction. It has become the "would-be" which is the basis for a "will-be." The ideal has become a law of conduct. And we readily recognize Peirce's psychological description as that of what we ordinarily call a habit.

Peirce admits that we do not know with certitude what the machinery is which converts resolution into determination (1.593). It is "something hidden in the depths of our nature." Peirce is interested for the moment only in a phenomenological analysis of what does happen. He adds that while we are conscious of forming our habits, later we are not necessarily aware of them. One of the ways in which we ordinarily recognize them on the appropriate occasion is by a feeling of need or desire. Peirce offers the following case as illustrative of the process he has been describing. Upon reflection I decide that I should talk to a certain person in a certain way. I plan or resolve to do so when I meet him. And to be sure that I will not be carried away in the heat of conversation I impress the resolution upon my mind so that when I do get into animated conversation with this person, al-
though my mind is completely occupied with the topic of conversation and I never advert to my resolution, still it influences my conduct (1.594). After I have left my friend, I begin reviewing what transpired and ask myself whether I lived up to my resolution. If the answer is affirmative, I am in the very formulation of the answer aware of a feeling of satisfaction (1.596).

In his illustration Peirce introduces the notion of critical review of conduct. It is this review which allows for control of conduct in the future in terms of ideals. Conformity produces satisfaction and consequently a pleasurable feeling; disconformity produces dissatisfaction and a painful feeling which indicates that our resolve is not yet fully a determination and this may lead us to resolve again, thus strengthening the determination.

This sort of process, Peirce proceeds to say, can be brought to bear on the question of whether my conduct conforms to my general as well as to my particular intentions. It can be applied still further to the question of the conformity of my conduct to the most general ideal of conduct befitting a man like me.

In any and all these ways a man may criticize his own conduct; and it is essential to remark that it is not mere idle praise or blame such as writers who are not of the wisest often distribute among the personages of history. No indeed! It is approval or disapproval of the only respectable kind, that which will bear fruit in the future. Whether the man is satisfied with himself or dissatisfied, his nature will absorb the lesson like a sponge; and the next time he will tend to do better than he did before. (1.598)

A man must frequently review his ideals; he must criticize them; he must control them. The job is never done once and for all time, because experience is continually contributing more cases, more situations, which throw more or less light on those ideals. According to Peirce the new data of experience are first digested in the depths of man's reasonable being and then brought to consciousness. "But meditation seems to agitate a mass of tendencies and allow them more quickly to settle down so as to be really more conformed to what is fit for the man" (1.599).

All these cases are practical. They deal with a man's review of his
conduct and ideals with a view to improvement. Peirce now points out that critical reflection can also be brought to bear on the theoretical question concerning in what the fitness of an ideal of conduct consists, and from that deduce what conduct ought to be. His concern is to remark once more that such theoretical inquiry is quite distinct from the practical business of forming conduct, while at the same time he admits that if one does not lose sight of the difference, such theoretical study "is more or less favorable to right living" (1.600).10 Peirce, then, admits a certain interplay between practical affairs and theoretical reasoning, but he is careful to offer a warning based on theoretical grounds and advice based on practical experience: do not rashly and precipitously abandon practical maxims and rules of conduct gleaned from ages of experience because some theoretical consideration or speculation casts a shadow of a doubt thereon, precisely because reason is notoriously fallible and so very slow to accept new principles as indubitable (2.177). Patience and prudence are the watchwords in translating the theoretical opinions into everyday rules of thumb. The theoretical search for truth must ever be pressed forward if man is to be true to his nature, but experience and nature are the final teachers

10 See Part I of this book for a discussion of theoretical and practical science. Peirce was forever pointing out the advisability of following instinct and traditional mores in practical issues of moral conduct. He thought of reasoning— theoretical reasoning—as very unreliable in these matters and instinct as practically infallible. And he thought that there was theoretical evidence for this position. His thoughts come through in a striking way in the ironic and satirical papers, "Detached Ideas on Vitally Important Topics." He told his Harvard audience that if by vitally important topics they understood matters of everyday moral decisions, how to succeed in business, or practical matters in general, they would be better off not to get involved in logic and philosophy. They just had to follow common sense and the accumulated wisdom of the ages. But these "vitally important topics" are not for Peirce so "vitally important." The most important, because specifically human, enterprise is the search for truth. And this can only be accomplished by reasoning and by engaging in theoretical investigation. To be sure, progress is halting and conclusions are fallible, but success is assured if men as a community persevere. Being a part of the community of researchers is what sets man off from the beast and what makes life worth living. That is why in another essay he could say that we are fortunate not to be tied to the infallible instincts of the animal kingdom. (See 2.178.)
and correctors of theory. Gamaliel once told the Sanhedrin that if this work was not of God it would pass away, while if it was, nothing they could do would destroy it (Acts 5, 34–37). This is much like Peirce’s attitude toward practical principles of action. If they are true, theory will not change them; if they are false, experience will sooner or later destroy them. Man’s search for truth according to the canons of right reason and in the spirit of humility can be, and indeed is, one of Nature’s most powerful means of making the truth appear because right reason requires respect for facts of experience and at the same time is itself a fact of experience which must be taken into account.

Thus Peirce has described what he takes to be the phenomenon of controlled action. He has found in man at least five grades of self-control which he listed in another place as follows: (1) inhibitions and coordinations that entirely escape consciousness; (2) instinctive modes of self-control; (3) self-control which results from training; (4) the power to control self-control (as when one becomes his own training master) in terms of some moral rule; (5) the power to control one’s control of control, that is, when one undertakes to improve his rules of conduct through a study of the normative sciences (5.533). Peirce, then, has tried to show how human purposes are both normative and capable of modification by critical review. Human purpose, the archetype of final causes, involves habits acquired and/or modified by reflection on experience. It is this capacity for critical review and control of actions and of habits of action which for Peirce defines reason. It is this capacity which defines man as a rational animal and therefore, while it supposes freedom on man’s part, freedom of choice, man is not free to accept or reject his nature and its freedom. Man is a rational animal whether he likes it or not; he has a final cause which even his perversity cannot completely frustrate; he is compelled to make his life more reasonable and in this lies his true dignity and liberty (1.602).

Thus Peirce discovers that man himself belongs to a natural or real class quite independent of his own doing or willing or wishing. While specific human purposes are subject to man’s control and so to his will, the purpose of his purposes, the final cause or end of man, is found not to be subject to control in the same sense. Man cannot completely vote himself out of the human race, because even the most drastic step of suicide would be a deliberate choice and so para-
doxically reaffirm that man is man unto the end. The only sort of control to which man's end is subjected in the hands of man himself is the extent to which it is fulfilled and developed in individual cases. Thus while human purposes are the "most familiar in our experience" and therefore the most easily analyzed, they are not the most basic final causes even for man. Even though man is in a process of evolution, rather because man is in a process of evolution, he cannot abandon the deep-seated drive toward more and more rational behavior. That would be to turn back the clock; it would be the end of his evolution or growth; it would be devolution or decay. Man's destiny in this process of growth is to contribute more and more by his own decisions and choices to the process itself.

Out of these considerations we are able to draw a distinction between acquired habit and natural disposition often overlooked by the commentators and yet one which throws considerable light on Peirce's doctrine. It is true that Peirce sometimes uses the word "habit" to cover both what is congenital and what is acquired (5.367, 2.711), but when he does so it is with full knowledge that strictly speaking habits are only acquired (5.538). Furthermore, at least once he explicitly warns his reader that he is about to use habit in a loose sense to cover any sort of disposition at all. What is important to notice is that for Peirce, while a given individual man can and does control his acquired habits he cannot control his natural disposition (his "nature," what he came into the world with, what he is), at least not in the same sense.11 It may be indeed that his nature is a habit or bundle of habits of something else—Nature, matter, mind or what have you—and Peirce sometimes talks this way (1.416). As we shall have occasion to see, his evolutionary theory of the emergence of conscious human mind from nature is in terms of habit-taking and grouping of habits.

Man, then, finds himself in the world with the power to reason, and the power to reason is none other than the power to submit actions, purposes, and ideals to critical review and control. Reasoning, then, is a type of moral or ethical conduct. If it is not subjected to any check or control, it is not deliberately approved and so is not reasoning. All deliberate conduct is conduct according to a rule, norm, or

general pattern of what is appropriate under the circumstances. These rules, norms or general patterns are habits, that is, acquired dispositions to act in a certain way rather than in another. These habits are themselves capable of critical review and control. This type of examination is what is undertaken in the normative sciences. Thus, if we ask in what does right reasoning consist, what habits of reasoning ought we to follow and to develop, the answer is that right reasoning consists in such reasoning as is conducive to our ultimate aim. What is or ought to be our ultimate aim? It cannot be something narrow or selfish. It must be the highest, broadest and most general possible aim; it must be something admirable in itself (1.611). We recognize the hierarchy of logic, ethics, and esthetics—sciences which investigate, respectively, what habits of thought, of conduct, and of feeling man ought to deliberately cultivate in order to fulfill himself.\footnote{12}

Laws of nature, therefore, are in Peirce’s view founded upon real active powers or potentialities in things. The type of causality proper to “would-be’s” is final, that is, specifying kinds of activity, specifying kinds of objects by imparting such a unity to the whole that the whole

\footnote{12 In the following paragraphs (1.612–1.614) Peirce is careful to reject any semblance of hedonism. In Peirce’s hierarchical arrangement of the normative sciences, aesthetics turns out to be what commands the rest and what is least satisfactorily developed. Not only is Peirce’s elaboration slight, but also appears to be confused and inconsistent. On the one hand, he seems to assimilate aesthetics to questions of taste, to feeling, to the subjective. And on the other hand, he rejects mere qualities of feeling as admirable in themselves without any reason and at least once talks of an intellectual side to aesthetic appreciation. The difficulties can be met satisfactorily, we believe, if we keep in mind that (1) Peirce’s final opinion about aesthetics was that it dealt with the formation of right habits of feeling and not with qualities of feeling, and (2) Peirce’s categories can never be separated or found in their isolated purity anywhere in experience. The \textit{summum bonum} itself, therefore, could not be just a pure Firstness, at least not insofar as it is operative in our world of experience. Again a habit of feeling is a Thirdness while a quality of feeling, in itself and unreflected upon, is a Firstness. The error of the hedonist is to confound the admirable in itself with the perfectly self-satisfied, the stationary, the self-contained. Peirce, in other words, challenges the contention that the admirable in itself must be pure Firstness. His counterproposal is to make it consist in the concrete growth of reasonableness—an evolutionary process of growth which needs all the categories to be understood but which is identified absolutely with no one of them (1.615).}
calls out its parts. Final causality is the causality of norms, rules, or
general patterns in terms of which deviations are recognized and
thought to be not only exceptions but also in some sense aberrations.
The most familiar and therefore most readily analyzed sort of final
causality is that exercised by human beings in their purposive, de-
liberate conduct. Upon analysis it becomes clear that human purposes
are, or at least ultimately involve, developed habits—developed within
the context of man’s natural dispositions or nature—which allow man
to criticize and control his activity and which themselves are subject
to review and modification in terms of other habits and of experience.
The critical review and control of habits is the object studied by the
normative sciences. When, therefore, man is called a rational animal,
it means that he is capable of consciously taking habits, and this itself
is a habit (not precisely of man, since rather it defines him, but of
nature in whatever that may be found ultimately to consist).

The similarity between the role which habit plays in Peirce’s
scheme and the role of form in Aristotle’s is too striking to go unmen-
tioned (cf. 6.347, for Peirce’s study of “matter” and “form” in Aristotle
and in Kant). Of course for Aristotle form has a variety of meanings.
It can be the sensible shape (morphé) of a material object, the intel-
ligible structure (eidos) of a thing expressed in a definition, or the
final cause. The latter two meanings will concern us here. In effect
Aristotle took Plato’s transcendent forms and made them completely
immanent. The Aristotelian form functions like the Platonic in that it
accounts for the intelligibility of the object informed, arms it with
power to act, and guides that activity along certain lines rather than
along others. Thus for Aristotle a thing’s nature is the norm for its
activity. Form puts finality into the object and allows that finality to
be truly active. A final cause which remained in every sense extrinsic
to an object could not produce any effect at all on the object. At best
it might be a terminus de facto reached. Briefly, for Aristotle formal
and final cause in natural objects tend to become identified. But this
formal-final cause is also evident in the principle by which an agent
acts as an efficient cause since it is what sets the agent to work and is
the source of its activity. It is what the scholastics called causa
causae. Peirce’s “habit” plays just the same roles. He undoubtedly

13 An. Post. 71 b9–12, 94 a20; Phys. 184 a10–14; De Coelo, 311
preferred “habit” to “form” because the latter was too static a notion. Habit was much more flexible and allowed for changes, modifications, growth and development, and at the same time preserved the important Aristotelian insight into real potencies or powers in things.

In order to generalize the results of his analysis of human conduct, Peirce must show that consciousness does not always entail the power of self-control. Although Peirce holds that there can be no self-control without consciousness he is not committed to the proposition that all consciousnesses exercise self-control. To appreciate this point a scholastic distinction may help, namely, that between conscientia directa and conscientia reflexiva. For self-control, reflexive consciousness is required, and of course that sort of consciousness supposes direct consciousness. The distinction between first and second intentions is based on this distinction of types of consciousness. The exercise of self-control supposes some sort of reflexive consciousness over and above direct consciousness.

We have seen that Peirce’s analysis of man revealed that there are some elements of his mind over which he has control and others over which he has none, but which are nevertheless necessary for the control which he does exercise.

Our logically controlled thoughts compose a small part of the mind, the mere blossom of a vast complexus, which we may call the instinctive mind, in which this man will not say that he has faith, because that implies the conceivability of distrust, but upon which he builds as the very fact to which it is the whole business of his logic to be true. (5.212)

One of the mind’s elements over which man has no control is the perceptual judgment, and yet it is through such judgment that he has experience of and contact with his environment. It is through the perceptual judgment that he has data to think about. One of Peirce’s most imaginative formulations of the pragmatic maxim incorporates this very idea:

The elements of every concept enter into logical thought at the gate of perception and make their exit at the gate of
purposive action; and whatever cannot show its passports at both those two gates is to be arrested as unauthorized by reason. (5.212) 14

This “instinctive mind” through which every concept enters into logical thought Peirce elsewhere calls “Insight . . . into the Thirdnesses, the general elements, of Nature.” Again he refers to it as a “faculty” which man must have because otherwise there would be no accounting for his undeniable ability to guess right among the millions of possible hypotheses which might explain a fact often enough to allow him to make genuine discoveries (5.171 ff.). Man, in other words, manifests an affinity to nature—he is in it, is part of it, and finally it is this affinity which gives him “il lume naturale” for choosing appropriate hypotheses at all (cf. e.g. 1.80, 2.750, 5.47, 5.603–604, 6.10). Instinctive mind, then, is part of the natural disposition with which man comes into the world, and must ultimately be constituted of “in posse innate cognitive habits, which is all that anybody but John Locke ever meant by innate ideas” (5.504).

Peirce finds that the gamut of self-control in man (from control of one’s control of control down to no control) is reflected in the higher forms of animal life lower than man, with the exception, of course, of that highest type of control which distinguishes man from the brute.

The brutes are certainly capable of more than one grade of control; but it seems to me that our superiority to them is more due to our greater number of grades of self-control than it is to our versatility. (5.533)

The brutes, for example, use some sort of language (a phenomenon of self-control) and seem to exercise some little control over it (5.534). They are, of course, conscious beings, and the grade of their consciousness is judged precisely by the sort of self-control they manifest. For Peirce, what sets man apart from even the highest brute is the power to criticize his thought logically—the power to think about

14 When Peirce claimed that pragmatism is only a step in synecchism (5.4), he was thinking of the latter as a generalization of the elements of mind or reason discovered in the analysis of reasoning which yielded his famous maxim.
thought. One form of this distinctive feature of man's consciousness is the power of hypostatic abstraction. The brutes do not show any tendency toward activities which require this sort of reflection (for example, they are not engaged in mathematical research or in the logic of mathematics) (5.534). The same sort of reasoning which led to the affirmation of uncontrolled elements in the human mind would lead to the same conclusion in the case of the mind of brutes.

Clearly for Peirce man is directly aware of at least some of those uncontrolled elements. For example, man is directly aware of his perceptual judgments, even though he is not conscious of the psychological and physiological processes involved. In so far as the brute too must have some kind of perceptual judgment (vis aestimativa, in scholastic terminology), the same holds for him. This consciousness of elements over which no control can be exercised is direct, not reflexive. Besides, Peirce argues for three degrees of consciousness: (1) consciousness of feeling, (2) consciousness of an interruption of consciousness, and (3) consciousness of learning (1.377-382). The first two degrees are certainly beyond the control of those beings which have them. Even the third type, consciousness of learning, might be in certain cases simply the result of random reinforcement of reflex responses to external stimuli, and be, therefore, only direct and not reflexive consciousness. Indeed Peirce proposes as an hypothesis that the physiological basis of any sort of consciousness is tied up with the activity of nerve cells discharging over different possible paths at random and slowly taking on an habitual response, that is, manifesting a tendency to reinforce that response which removed the stimulus (1.390 and 6.259 ff.). In the case of a frog whose brain has been removed and yet whose leg muscles respond to stimulation (say, by a drop of acid), there is some feeling or awareness of the stimulus, and so some sort of consciousness present. But the random kicking and rubbing of the leg does not show control over the movements, but rather that the movements are controlled by the stimulus. The "learning" that takes place is merely a conditioning of the reflex response by "reward" (removal of stimulation). Peirce goes even further and proposes that these properties of the nervous system (to feel, to discharge, to "learn") are rooted in the very stuff out of which all living tissue is made, protoplasm. He suggests that all the properties of protoplasm can be grouped under the headings sensibility, motion,
and growth (again corresponding to his three categories) and that this “life-slime” is in some sense “aware” of its environment and that it acquires habits (e.g., in regard to its feeding) (1.393 ff., and 6.246 ff., 6.278 ff.).

Not every conscious being, therefore, is capable of self-control, although every being which is capable of self-control is necessarily conscious. Indeed, in terms of a doctrine of continuity and evolution Peirce must say that self-control developed out of a more rudimentary form of consciousness in which the power of self-control was present only virtually. And now that Peirce has succeeded in generalizing the role of habit in giving direction to all living beings from man to cells, he proceeds to extend the notion still further to include what the man in the street calls “nonliving” beings. Again, Peirce’s commitment to continuity does not allow him to admit a sharp line of demarcation between “living” and “nonliving,” between “mind” and “matter.” The fact that Peirce thought of his system as an objective idealism indicates what direction his analysis must take. Perhaps his remarks about the classification of the sciences will help us to see the point. Peirce classified the special sciences under two general headings, physical and psychical, the former dealing with the workings of efficient causation, the latter with the working of final causation (1.242). Just as efficient and final causation cannot be separated, so physical and psychical sciences are interdependent to some slight degree at least (1.252 ff.) and both are dependent upon philosophy (1.249–250). Philosophy, however, cannot be divided into an efficient and final wing. “For . . . to philosophy must fall the task of comparing the

15 Peirce tells us in one place that man lives in two worlds, an inner and an outer, and that these worlds are bridged by his acquired habits and his natural dispositions (5.487). He defines consciousness in general as a congeries of nonrelative predicates (feelings), symptomatic of the interaction of the outer world and of the inner world, and amenable to direct effort of various kinds with feeble reactions. The outer world seems to act directly on the inner, while the inner only indirectly, through habits, on the outer. Thus consciousness is necessary for self-control since without it or at least without that of which it is symptomatic, “the resolves and exercises of the inner world could not affect the real determinations and habits of the outer world” (5.493). Peirce’s “inner” and “outer” worlds bear a remarkable similarity to Teilhard de Chardin’s “within” and “without.”
two stems of causation and of exhuming their common root" (1.273). Given a choice between Cartesian dualism and some variety of monism, philosophy must adopt the latter. Peirce sees three possible directions in which monism can be developed: (1) neutralism, which would take physical and psychical laws as independent of each other and stemming from some third Urstoff, (2) materialism, which would take the psychical laws as derived from the physical, and (3) idealism, which would take the physical laws as derived from the psychical. Peirce disposes of neutralism by Ockham’s razor and of materialism by the first principle of scientific logic, that is, do not resort to the ultimate and inexplicable as an explanation (6.24). Objective idealism is the only rational alternative: matter is effete mind.

Leaving aside for the moment Peirce’s objections to materialistic monism which he identifies with the absolute determinism of mechanistic philosophies, let us consider the strategy of argumentation dictated by the espousal of objective idealism. If matter is effete mind, and if physical laws are derived from psychical, the great law of the universe is that of mind. What is the law of mind?

Logical analysis applied to mental phenomena [for example, the analysis in “Ideals of Conduct”] shows that there is but one law of mind, namely, that ideas tend to spread continuously and to affect certain others which stand to them in a peculiar relation of affectability. In this spreading they lose intensity, and especially the power of affecting others, but gain generality and become welded with other ideas. (6.104) 16

This is recognizable as the tendency to generalize and to form associations (6.21). This tendency is nothing other than the tendency to form habits, itself a habit (6.612). Yet a habit, as a tendency to generalize, cannot become wooden and fixed without ceasing to be a habit. The generalizing of habit only makes it more likely that something will react in one way rather than in another because it has already so reacted (6.148, 13.90 ff., 1.409). As Peirce remarks, did habits establish an absolute necessity,

16 See 6.102–163 for a lengthy development of the law of mind.
... habits would become wooden and ineradicable and, no room being left for the formation of new habits, intellectual life would come to a speedy close. (6.148)

In other words, the law of mind would destroy itself. The uncertainty of its action, therefore, is no defect in this law but rather its very essence. Mind is not subject to law in the absolute sense of the determinists, nor indeed is matter. Mind only experiences “gentle forces” which make it more likely to act one way rather than in another. And now we come to the key sentence: “There always remains a certain amount of arbitrary spontaneity in its action, without which it would be dead” (6.148, emphasis added). The action of mind, then, requires spontaneity, and spontaneity is characteristic of life.

The relationship between law, evolution, and chance in Peirce’s cosmology is beginning to take definite shape. We will discuss this in detail later on, but for the moment we want to see how these considerations enter into Peirce’s extension of habit down to the world of physics and chemistry, down to the world of “physical laws.” The strategy of the move is clear enough. Peirce must claim that even atoms manifest a certain spontaneity in their activity and are not, therefore, contrary to the unsophisticated judgment of the man in the street, completely dead. To accomplish that, Peirce must show that no laws of nature whatsoever are completely exact and unvariable, not merely in the sense that our expression of those laws is inexact nor merely that there are errors in observation, but that the observed objects themselves do not conform precisely to the general ideal governing them. In turn, this will require an analysis of the laws of conservative and nonconservative action.

Peirce is explicit in siding with the ancient atomists who made the atoms swerve as they whirled in the void (6.36, 6.201). Atoms are not completely dead. By swerving they manifest a certain spontaneity, “immanent action” in scholastic terms, and in so doing reveal themselves as conscious in some rudimentary way.18 Consciousness, for

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17 See 6.201, “chance” is a mathematical term for “spontaneity.”
18 Peirce seems to imply that any activity subject to any law of reason whatsoever, even only the law of statistics in the case of the chance swerving of atoms, is really a sort of conduct, and so ultimately subject to control. To the control of what or whom? Who or What is the Objective Mind? In
Peirce, is, we have seen, in the category of Firstness. So is spontaneity. Peirce feels he can conclude, therefore, that

... whatever is First is *ipsa facto* sentient. If I make atoms swerve—as I do—I make them swerve but very very little, because I conceive they are not absolutely dead. And by that I do not mean exactly that I hold them to be physically such as the materialists hold them to be, only with a small dose of sentiency superadded. For that, I grant, would be feeble enough. But what I mean is, that all that there is, is First, Feelings; Second, Efforts; Third, Habits—all of which are more familiar to us on their psychical side than on their physical side; and that dead matter would be merely the final result of the complete induration of habit reducing the free play of feeling and the brute irrationality of effort to complete death. (6.201)

Thus by introducing spontaneity, chance, rudimentary consciousness into the physical world, Peirce feels that he can break the vise-like grip of mechanism which not only does not explain any of the phenomena but so chokes the life out of everything that any movement at all, even purely "mechanical" would be impossible. What Peirce is getting at is that there is no such thing as purely mechanical movement. All movement requires some degree of spontaneity, and indeed, paradoxically, so does the observed regularity of the movement. As Peirce himself puts it,

I make use of chance chiefly to make room for a principle of generalization, or tendency to form habits, which I hold has produced all regularities. The mechanical philosopher leaves the whole specification of the world utterly unaccounted for, which is pretty nearly as bad as to baldly attribute it to chance. I attribute it altogether to chance, it is true, but to chance in the form of spontaneity which is in some degree regular. [That is, governed by laws of probability.] (6.63)

places, Peirce seems to tend toward identifying it with God and in other places seems to consider the question unnecessary.

19 "... the existence of absolute chance, as well as many of its charac-
To put it in another way, for Peirce there is no physical without the psychical, just as there is no pure efficient causation without final. While spontaneity, chance, or rudimentary consciousness is not identical with mind or reason and its fundamental law of habit-taking, it breaks the bonds of pure efficient causation and allows Mind and its law entrance, making the physical intelligible.\(^{20}\)

Peirce centers his analysis of physical laws on the question of causation. He is considering the relation between efficient and final cause, which we discussed above, from another side. There are, he tells us, many examples of “empirical laws” in books on physics which, although they are satisfied by observation of the facts under limited circumstances, do not “go down to the roots of existence” exhibiting the general form of all phenomena (7.468). The law of centrifugal force is a good example. It applies to the force exerted on railroad tracks by the wheels of a train negotiating a curve. The force is real and it even leaves its mark on the tracks and on the wheels. But what happens when the formula for centrifugal force is extended to cases where the motion in question is not restrained and guided by something rigid like railroad tracks? What happens when it is applied to the revolution of the planets?

In this case, centrifugal force is a mere formula,—a formula
which is undoubtedly quite correct as far as the effect
goes, while yet the centrifugal force is a merely formal
affair with nothing at all corresponding to it in nature. (7.468)

Peirce likens this sort of extension to a bookkeeping fiction.21

It is very much as if between two men, A and B, there had
been a single transaction consisting in A lending B $5. Now
if B were to keep his books in such a manner that the state
of the account as entered on those books made A owe
him $100 with $105 on the opposite side of the account, the
entries would in effect be correct; but yet that hundred
dollars would be a fiction of book-keeping. In like manner
the centrifugal force of a planet is a fiction due to using
polar coordinates in place of rectangular coordinates. (7.468)

Certainly, if the sun’s gravitation were suddenly destroyed, “there
would be at the first instant an acceleration of the plant away from
the circular orbit equal to the centrifugal force,” but, Peirce argues,
this acceleration away from the circular orbit is simply the entry we
have to make on one side of our accounts to balance the first fictitious
entry we virtually made on the other side by taking the planet’s cir­
cular motion as the standard from which to reckon accelerations
(7.468). 22 The question Peirce wishes to raise, therefore, is whether

21 The technique of “balancing the books” is now called by physicists
“renormalization.” It consists in certain adjustments that must be made
between theoretical computation and observation. Fermi used precisely the
analogy of bookkeeping.

22 The concept of centrifugal force comes from such phenomena as
wheels following a curved track or the motion of a sling whirled in the air.
Once we generalize the idea in such a way that we remove the string which
keeps the object in a circular path or the rigid track forcing the wheels to
turn, we have a mathematical formula only, useful perhaps for explaining
the phenomena but no longer a “real force” or real entity. Peirce was not
alone in realizing this. Indeed, as Max Jammer has shown, physicists were
already well on their way to making the notion of force as applied to gravita­
tion operational, and were inclined to jettison the notion that force is some
sort of entity in its own right. See Concepts of Force (New York: Harper
Torchbooks, 1962), Ch. 10 and 11, pp. 188–240. Peirce would be willing
to go along with this interpretation within physics, but would not be willing
to admit there are no forces at work in the cosmos with which philosophy
or not there is any way to tell that any "empirical law" is not just a bookkeeping fiction but a "real and a living action in nature" (7.469). Peirce realizes that nominalistic logicians will not admit any such distinction in virtue of their "preconceived metaphysical opinions" and that "of absolute knowledge there can be no question" (7.469). What he is after is the hypothesis sanctioned by synechism—the hypothesis which does not block the road to inquiry.

Peirce immediately formulates his hypothesis, and it is not hard to recognize the notion of habit therein implied.

But if we see that as soon as circumstances are somewhat varied, the form of the law is lost, the inference would seem to be that it is not a universal or living mode of action. If on the other hand, we find that as soon as the form is prevented from manifestation in one shape it immediately reappears in another shape, and especially if it shows a power of spreading and of reproducing itself, these phenomena may be considered as evidence of genuine vitality and fundamental reality in the form of the law. (7.469)

What he intends to prove is that causation, as distinct from the action of conservative force, "is a real, fundamental, and vital element both in the outer and in the inner world" (7.469). In another place Peirce must reckon. One of his main theses is precisely that potentialities are real and living forces in nature.

23 Here Peirce seems to be groping toward a formulation of the second basic principle of special relativity theory: the covariance of basic physical laws. (See A. Einstein and L. Infeld, The Evolution of Physics [New York: Simon and Schuster, 1961], pp. 177–178.) Of course, he never put it quite that way since he was not dealing with exactly the same sort of problems as Einstein. This is not surprising when we remember that relativity was in the air about this time. Physicists were beginning to run into problems which Newtonian space, time and laws of motion could not handle satisfactorily. The time was fast becoming ripe for a fresh look at the whole structure of that science. As early as 1904 Poincaré formulated a theory of relativity very much like Einstein's. (See Sir Edmund Whittaker, A History of the Theories of Aether and Electricity [New York: Harper Torchbooks, 1960], pp. 30 ff.) Peirce knew of these developments and could not have been surprised when, in 1905, Einstein's paper amplifying and modifying the relativity theory of Poincaré and Lorentz appeared.
examines just what is meant by the principle of causation and finds that it means many different things to different people at different times (6.66). For the sake of the argument, however, he assumes that the principle involves three propositions to which most thinkers of his day would subscribe, namely, (1) that the state of things at any one instant is completely and exactly determined by the state of things at one other instant; (2) the cause, or determining state of things, precedes the effect or determined state of things in time; and (3) no fact determines a fact preceding it in time in the same sense in which it determines a fact following it in time (6.68). Although Peirce himself does not admit the absolute determinism implied in this formulation, it will serve his purposes, namely, to show that all three of these propositions are in flat contradiction to the laws of mechanics, and that causation is not reducible to any such law even though it has its origin in the very same thing as those laws. If the laws of dynamics contradict the principle of causation in its most deterministic form, it follows that a determinist cannot appeal to those laws to support his metaphysical position. If, on the other hand, causation in some sense of the term can be shown to be different from conservative force and irreducible to it, there is then room for end-directed activity even in the physical world. If, finally, both conservative action and nonconservative action (causation) can be shown to arise from a common root, it follows that neither alone provides a satisfactory understanding of the universe.

There is no point in examining the details of how Peirce shows that the laws of dynamics contradict the three propositions belonging to the mechanistic version of the principle of causation cited above (cf. 6.68–69). Let us simply point out that since, in terms of the laws of dynamics, the future determines the past in exactly the same way in which the past determines the future, he can define the essential characteristic of conservative action as reversibility. The classic example of reversibility is a ball falling and striking a perfectly elastic horizontal surface. Its velocities before and after striking the surface will be exactly the same except in reverse order, and the reason ob-

24 Peirce remarks that if the word "teleological" is too strong, then we might invent the word "finious" to describe the end-directed nature of nonconservative action (7.471). Modern biologists have invented another word for the same idea, "teleonomic."
viously is because velocity is a function of the square of the time. Since even powers admit both positive and negative values without affecting the result, every law of dynamics in which an even power appears is conservative. As we would expect, then, nonconservative action is characterized by irreversibility of phenomena and a tendency toward a final state (finiosity) \((7.472)\). While it is clear that psychical phenomena show nonconservative action, what is more interesting is that even phenomena in the physical world which are of psychical interest seem at least to be under the governance of the same kind of action. For example, birth, growth, life, friction, viscosity, combustion, conduction of heat, capillarity, diffusion of liquids, to mention but a few, all seem to be nonconservative.

Physicists generally explain those actions which seem to violate the law of the conservation of energy (nonconservative actions) in terms of the action of chance. Thus, for example, the phenomenon of gas escaping through a hole in a cylinder can be analyzed into the change of movement of millions of molecules. Again, friction can be looked on as the chance interlacing and rupturing of molecules forming the surfaces in contact \((7.472)\). Peirce is in complete accord with this sort of explanation \((\text{cf. } 7.470, 6.73)\).

As to those explanations which the physicists propose for irreversible phenomena by means of the doctrine of chances as applied to trillions of molecules, I accept them fully as one of the finest achievements of science. . . . This explanation demonstrates that the agency of energy is disseminated through every department of physical phenomena. But in one thing it fails; namely, it fails to show the absence of a very different kind of agency; and it not only fails to show its absence, but even supplies the means of proving its presence. \((7.470)\)

The agency to which Peirce refers is spontaneity or rudimentary consciousness.\(^{25}\)

\(^{25}\) When Peirce comes to work out his evolutionary hypothesis, he will refer to this rudimentary consciousness as quale-consciousness. Strictly speaking it is the first emergence from the “Nothing of boundless freedom” and is not a waking consciousness. It is a potential consciousness \((6.219–221, 6.198)\).
We will not attempt to go into the mathematico-logical analysis of chance and probability worked out so carefully by Peirce. It is sufficient for an understanding of what he is up to simply to remark that he does not put chance down to our ignorance.

Surely, I need not waste breath in refuting that feeblest of attempts at analysis which makes chance to consist in our ignorance. For that has already been sufficiently done in the Logic of Chance of John Venn. . . . It is the operation of chance which produces the retardation of the upper layer of air [an example of friction which Peirce had just considered] . . . ; but surely it is no ignorance of ours that has that effect. Chance, then, as an objective phenomenon, is a property of a distribution. (6.74)

In one place, Peirce tells us clearly that chance is "that diversity and variety of things and events which law does not prevent" (6.612). This is the real chance upon which kinetic theory, for example, depends. It can be shown, Peirce declares, that this chance must be absolute, that is, not derivable from law, by the very logic of explanation (cf. Part III, Chapter 1) and at the same time it is not totally lawless since it exhibits at least the uniformity of the absence of any determinate law (6.606). This is the only sort of regularity chaos could manifest, but because of it chaos can be reasoned about statistically and could allow for the development of determinate law by means of the law of habit (6.606). And if it be objected that Peirce does not escape making law absolute, since the tendency to take habits is itself a law, the reply is that while the word "law" is convenient to describe that tendency, it is not used in the sense of inviolable, mechanical law but in the sense of mental law the violation of which is so included in its essence that unless it were violated it would cease to exist (6.612).

If chance is a property of a distribution, a distribution is a property of a collection. Since, however, there are different kinds of collections, the sorts of distribution of which each is capable are different and so each must be considered in turn to determine whether or not it can have a chance or fortuitous distribution. Peirce examines in turn denumeral, enumerable, and more than denumeral (continuous) collections (6.75–78). His conclusion is that chance is governed by the
laws of probabilities, formal laws of mind or reason, present in any world that is knowable. They are not themselves material laws of nature, but are the very condition for there being any such laws since these formal laws permit the gradual formation of material laws through habit.

A fortuitous distribution of, let us say, colored and white objects, is the highest pitch of irregularity. Any departure from this irregularity, that is to say, any regularity, may tend in either of two directions: (1) the colored things and the white things may become more perfectly and uniformly mixed as when they would become arranged alternately, or (2) the colored things and the white things may tend to become grouped together. Both these tendencies may be called a process of sifting (6.80). Can a conservative force bring about sifting? Peirce answers, yes and quite inevitably (6.80). He gives the example of a ray of white light striking a prism. The different wave lengths of light, fortuitously distributed in that ray, are sifted out to form the spectrum. Another might be the case of gas escaping from one container into a larger. Because the pressure is lowered, the molecules’ state of equilibrium in container A is disturbed and so the particles rush out into container B, but they will re-establish a state of equilibrium again in the new container.

Conservative action, however, is characterized by its reversibility. Consequently, if each wave of light diffracted by the prism, and each molecule of escaping gas, were to strike a perfectly elastic surface at right angles to its path, it would reverse its direction and the original state of the system would be restored—white light and gas in container A. Peirce points out that this does not happen, except perhaps in a laboratory, and then only imperfectly, due to the elaborate contrivance of the experimenter (6.80).

Conservative force, left to itself, can produce no such result, because it depends on the purposeful exact adjustment of each pencil of light. Now one of the first things that the mechanical philosophy discovered was that there are no final causes in pure mechanical action, (6.80)

Still, it is true to say that the experimenter could not intervene in this purposeful way unless he were dealing with a conservative force. He could not so intervene, for example, in the process of organic growth.
Can conservative forces bring about a fortuitous distribution? Peirce answers in the negative. The reason is that a fortuitous distribution in a phenomenon can only be brought about by another fortuitous distribution in the conditions of the phenomenon. Take a jar containing some hot nitrogen and then add some cold oxygen. At first the nitrogen molecules will be moving with various vis viva fortuitously distributed, and so will the oxygen molecules. On the average, however, the oxygen molecules will be moving more slowly than the nitrogen molecules. In this state of things the distribution of the vis viva of nitrogen and oxygen molecules taken as one collection will not be fortuitous. Now in the course of time there will be continual fortuitous encounters of the two sorts of molecules and consequently there will be a continual interchange of vis viva with the result that gradually there will be an approximation to one fortuitous distribution of vis viva among all the molecules.

That which happens, happens entirely under the governance of conservative forces; but the character of fortuitous distribution toward which there is a tendency is entirely due to the various fortuitous distributions existing in the different initial conditions of the motion, with which conservative forces never have anything to do. (6.81)

This is more remarkable, Peirce observes, because although the initial distribution of vis viva tends gradually to die out, the subsequent fortuitous distributions dependent upon the initial conditions not only hold their ground, but mark their effect wherever the conservative forces act. “Hence, it is that we find ourselves forced to speak of the ‘action of chance’” (6.81).

So far, then, Peirce has shown that from a fortuitous distribution of objects acting under conservative forces can arise a uniform distribution (state of equilibrium). Now this is very much like one of the characteristics of nonconservative force, namely, finiosity. He also maintains that this phenomenon cannot be reversed except by the purposeful intervention of an experimenter, either by introducing new energy into the system to disturb the equilibrium or by introducing perfectly elastic reflectors to make the molecules reverse their direction. Perhaps such intervention could happen by the chance interference of one dynamical system by another, but the point is that the
conservative forces within a system, left to themselves, cannot bring about such a reversal. Thus, the tendency of an inertial system to move from a completely fortuitous distribution to a uniform distribution manifests the other characteristic of nonconservative force, irreversibility. Now Peirce draws attention to two other important facts about uniform distributions: (1) not all of them seem to be the result of fortuitous distributions, and (2) even those which are, also involve some regularity in the conditions. Chemical reaction and electricity, for example, seem to involve a uniformity not due to fortuitous interaction, but to a definite relationship between the particles interacting—a fixed relation of attraction and repulsion in one case, fixed valences in the other. In the case of Boyle's law (illustrating fact 2 above), the density of a gas varies directly as the pressure, because more molecules confined to a smaller space will strike the walls of the container per unit time. But Peirce observes that this is not due to the fortuitous distributions of the molecules alone; it also requires that the paths of the molecules be all nearly rectilinear. But what is true of all the molecules is a regularity (7.519). Boyle's law, therefore, is due to fortuitous distribution plus a regularity. Peirce concludes that regularity in a phenomenon supposes some regularity in its initial conditions; irregularity supposes a fortuitous distribution in these conditions.

It would seem, therefore, that Peirce has effectively done away with monism altogether. He appears to have painted himself into a corner, hemmed in by two ultimate principles: law and chance (7.521). If it were only a question of some formal law at the base of every uniform distribution, there would be some hope of a rational explanation (7.511). But it is not merely that, because in many cases constants are involved.

The explanation of the laws of nature must be of such a nature that it shall explain why these quantities should have the particular values they have. But these particular values have nothing rational about them. They are mere arbitrary

26 Peirce means by "rational" in this context "rationalistic" or "a priori." In his day a number of physicists, influenced by Kant, were trying to deduce all the laws of dynamics a priori. For example, Heinrich Hertz's The Principles of Mechanics (1894) brings in the role of experience in a single paragraph. See Dover edition, 1956, p. 145.
Secondnesses. The explanation cannot then be a purely rational one. (7.511)

The way out of the difficulty, then, is to look for an explanation which is not "purely rational," that is not purely rationalistic. In other words, Peirce does not give up immediately in face of a serious difficulty. To do so would be to violate his fundamental law of scientific logic: do not block the road to inquiry. The fact that on extreme rationalistic principles he would have to admit law and chance as two ultimates, two inexplicables, as the explanation of the cosmos is an argument against the adequacy of those principles. Deductive logic is not the only kind of logic, nor is deduction the only kind of valid argumentation, nor is necessary reasoning the only kind of reasoning. There are also probable reasoning, abductive inference, and evolutionary logic in Peirce's "weapons-system." Indeed as soon as he stated this difficulty he added:

Or if we are to escape this duality at all, urged to do so by the principle of retroduction, according to which we ought to begin by pressing the hypothesis of unity as far as we can, the only possible way of doing so is to suppose that the first germ of law was an entity, which itself arose by chance, that is as a First. (7.521)

Chance, then, after all, can explain law if it is integrated into a process of evolution (7.512 ff.). This process, however, must proceed according to some principle, itself of the nature of a law, but such a law as is capable of developing itself, not perhaps such that if it were entirely absent it would create itself, but such that, when present, would strengthen itself. Thus we are led to the hypothesis of a universal tendency in all things toward generalization and habit-taking (7.515).

Peirce, then, believed that he had driven life, spontaneity, chance, and rudimentary consciousness, all the way down to the atomic world, and thus had loosened the bonds of mechanistic determinism to allow the entrance of mind into the world. He also thought that this kind of reasoning would allow him to pivot and so to explain the development of higher grades of consciousness through a philosophical theory of evolution or emergence. The logical principles of pragmatism, he was convinced, would permit no other sort of explanation, for the alterna-
tive, absolute determinism, would block the road of further inquiry in science and in philosophy, leaving an increasing number of questions unanswered supposedly because they were unanswerable. Logic requires that any meaningful question have an answer and that before one too hastily declares a question meaningless because it is yet to be answered, he explore as many alternative hypotheses as he can or as there are.

Peirce always insisted that his tychism was merely a corollary to his synechism. He objected to having his philosophy as a whole called tychism because that would be to misrepresent and to distort his views. Synechism is the very heart of Peirce’s thought. Fidelity to the pragmatic maxim, he considered to be a step leading to that view. Tychism enters into the picture only because synechism requires it. Synechism requires it because there is no other way to account for the world except in terms of an evolutionary hypothesis, and without spontaneity there could be no growth or development of any kind. It is no wonder, then, that the synechistic theory of law which we have been analyzing makes law to be founded in living potentiality manifesting itself in the tendency toward habit-taking and generalization.

This habit is a generalizing tendency, and as such a generalization, and as such a general, and as such a continuum or continuity. It must have its origin in the original continuity which is inherent in potentiality. Continuity, as generality, is inherent in potentiality, which is essentially general. (6.204)

It only remains for us now to examine in some closer detail Peirce’s philosophical theory of evolution. But before leaving this section on synechism, it might be helpful to reproduce here Peirce’s own summary which appeared as the conclusion to his paper “The Law of Mind.” Although he was very dissatisfied with this article as a whole, its conclusion does make clear those elements Peirce meant synechism to include.

I have thus developed as well as I could in a little space the synechistic philosophy, as applied to mind. I think that

27 Cf. e.g. letters to James, March 13, and December 26, 1897; Perry, op. cit., p. 222 and 419.
I have succeeded in making it clear that this doctrine gives room for explanations of many facts which without it are absolutely and hopelessly inexplicable; and further that it carries along with it the following doctrines: first, a logical realism of the most pronounced type; second, objective idealism; third, tychism, with its consequent thoroughgoing evolutionism. We also notice that the doctrine presents no hindrances to spiritual influences, such as some philosophies are felt to do. (6.163)