Charles S. Peirce

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3. The Beginning & the End

An hyperbola determines two limits, its asymptotes, which are indefinitely approached but never reached. Since Peirce uses this analogy to characterize the evolutionary process, one is not surprised that he gives an account of its limits, that is, of the universe’s beginning and end. Man, of course, cannot experience these limits, and yet they are logically required if evolution takes an hyperbolic course. Since this is speculation about the infinite, although he used all the logic and mathematics at his disposal, Peirce himself had to admit his account of universe’s origin must seem to his reader “wildly confused” (6.203).¹ For all the obscurity, however, we must consider the limiting cases for completeness.

Peirce says relatively little about the universe’s end and a good deal about its origin. This is not to imply that the cosmos’ outcome is any less important than its beginning. In some respects the outcome is more important for Peirce since so much of his logical theory depends upon the “long run” and since he frequently defines reality in terms of the ultimate agreement of the community of researchers. But since there are two papers which deal with the beginnings in some detail, it is best to start there and consider the universe’s end later.

The two papers we are about to consider were written about 1898. By this time Peirce’s cosmology had taken definite shape and he was seriously engaged in thought about the normative sciences. One paper is called “The Logic of Continuity” and the other “The Logic of Events.” The editors of the Collected Papers have given the sections considered here the titles “The Logic of the Universe” and “Objective Logic,” respectively. Since the papers complement each other we will discuss them together.

¹ See 6.419 ff. for an early expression of the importance of determining whether the universe is finite or infinite in age and extent. See 1.273 ff. for a much more developed mathematical approach to the same sort of question.
The question of origins is metaphysical rather than cosmological because it deals with the universe as a whole.

Metaphysics has to account for the whole universe of being. It has, therefore, to do something like supposing a state of things in which that universe did not exist, and consider how it could have arisen. (6.214)

But because the question of the universe's origin is metaphysical, it is logical since, for Peirce, logical principles are principles of being. Such an investigation, then, must consider the objective logical sequence of the world's origin. There can be no question of temporal sequence since time itself, as an organized something, only began with the cosmos.²

With this fundamental distinction in mind, let us consider the strategy of Peirce's reasoning. He states that the basic supposition back of every attempt to understand something is "that the very objects of study themselves are subject to a logic more or less identical with that which we employ" (6.189). In other words, science is realistic and not nominalistic.³ The "logic of the universe," therefore, governs ours. Our logic aspires to the universe's and not the other way round. Thus, the universe's own intelligibility is normative of our thinking. Whatever theory we entertain must submit itself to our experience of how things are and not dictate how things must be.

Consequently, with the modesty befitting a scientific man, Peirce begins by ascertaining as nearly as possible how things are in the world of our experience. According to him, logic shows that continuity is simply a higher type of generality. It is in fact relational generality (6.190). Our experience tells us that there is at least some

² This is an answer to Kant's fourth antinomy (A452–B480; A453–B481). To think of the cosmos as beginning in time leads to an absurdity, but to think of the beginning of the cosmos as the beginning of time does not.

³ Peirce says that science "supposes" or "at least hopes" that the world is intelligible. It would be hasty to conclude from this reservation that Peirce thought any less of the arguments he gave elsewhere in support of realism. All he needs for the passage under consideration is the lesser claim. Besides, humble fallibilism requires the elimination of "cocksureness" even where one is convinced that one holds the best hypothesis so far offered. It could and should be altered if the evidence warrants a change.
continuity and generality in the world, since there are real laws of nature. As a matter of fact, we know the world only to the extent that we discover these laws. According to the logic of explanation (see Part III, Chapter 1), it is precisely the regularity of the universe which must be accounted for. Our world is one of variety and uniformity in which, as far as we can tell, there is a definite movement from lesser to greater organization. Variety and diversity cannot be explained in terms of uniformity, but uniformity can be explained in terms of variety and diversity through the mediation of habit. So the universe is evolving from chaos to order.

Granted, then, that the uniformity of our universe is the thing to be explained, the question Peirce puts to himself is whether one ought to look upon that order as the result of welding together discrete entities or not (6.191). On the one hand, Peirce's logic of explanation seems to demand something like that, since it must account for order rising out of chaos. On the other hand, our logic, as the reflected image of the universe's, seems to indicate that human reasoning always moves from the vague to the definite, from the homogeneous to the heterogeneous (6.191). Apparently, then, the uniformity of our universe ought to be explained in terms of something still more homogeneous and vague, or, in Peirce's words, in terms of a still higher sort of continuum. But in that case, how can we claim to be explaining uniformity in terms of variety?

The inconsistency is only apparent, but before we show why it is, let us try to understand what led Peirce to argue for an original and primordial continuum of pure indeterminacy as the beginning-limit of our world's evolution. There were two reasons: (1) since he took seriously the proposition that our logic reflects the universe's, he was forced to admit "in Spencer's phrase [that] the undifferentiated differentiates itself" (6.191), that is, evolution proceeds from

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4 See 6.88–101. Peirce analyzes four or five positions concerning how much variety and uniformity we are to admit.

5 Peirce was convinced that the hypothesis most in line with science is the one which supposes that there is some progress and development in the universe, that is, which holds that the cosmos goes from somewhere to somewhere. He could not admit either the "Epicurean" or the "cyclic" conceptions of time (1.363). It is not that he thinks them foolish or inconceivable but simply that experience favors evolution (1.273).
the vague to the definite; (2) if all continua are made up of discrete units (individuals or collections or entities in one-to-one correspondence with either), Peirce thought that he could deduce a contradiction (Cantor's paradox of the greatest cardinal) and to resolve the paradox he denied that the greatest multitude has any discrete or actual parts at all. This greatest multitude which has no parts Peirce called a potential aggregate (6.185 ff).

When I say that the series of abnumeral multitudes has no limit, I mean that it has no limit among multitudes of distinct individuals. It will have a limit if there is properly speaking, any meaning in saying that something that is not a multitude of distinct individuals is more than every multitude of distinct individuals. . . . That which is possible is in so far general, and, as general, it ceases to be individual. Hence, remembering that the word “potential” means indeterminate yet capable of determination in any special case, there may be a potential aggregate of all the possibilities that are consistent with certain general conditions; and this may be such that given any collection of distinct individuals whatsoever, out of that potential aggregate there may be actualized a more multitudinous collection than the given collection. Thus the potential aggregate is, with the strictest exactitude, greater in multitude than any possible multitude of individuals. But being a potential aggregate only, it does not contain any individuals at all. It only contains general conditions which permit the determination of individuals. (6.185)

Peirce might have tried to resolve the paradox of the greatest

\[ 2^n = n \]

\[ 2^M \]

Cf. M. G. Murphey, *op. cit.*, pp. 263 ff. Murphey's careful analysis shows that in fact Peirce failed to prove his paradox because he failed to produce a genuine case in which \( 2^n = n \). Still Peirce's formulation of the paradox is correct and Cantor himself proved it in 1899. Cantor showed that the power-set of any set is always greater than that set \( (2^n > n) \). He also showed that the set of all sets, \( M \), must include, or be equal to \( 2^M \), since \( 2^M \) is the set of sub-sets of \( M \). Peirce's solution to the paradox, therefore, is of genuine interest.
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cardinal after the manner of Russell’s theory of types.\textsuperscript{7} We are inclined to think that he did not because of his ultrarealistic contention that all logical processes reflect nature’s. The vague and indefinite are real for Peirce. So he had no difficulty in admitting a pure and absolute indeterminacy at the beginning of everything and out of which everything arose. His solution did escape the contradiction of the greatest cardinal and at the same time avoided Russell’s conclusion that there can be no meaningful self-referential propositions.\textsuperscript{8}

Just how does Peirce characterize the initial condition of the universe?\textsuperscript{9}

The initial condition, before the universe existed, was not a state of pure abstract being. On the contrary it was a state of just nothing at all, not even a state of emptiness, for even emptiness is something.

If we are to proceed in a logical and scientific manner, we must, in order to account for the whole universe, suppose an initial condition in which the whole universe was non-existent, and therefore a state of absolute nothing. (6.215)\textsuperscript{9}

But there are two sorts of nothingness, that of negation and that of complete indeterminacy. The nothingness of negation is really otherness and “other than” is a relation which can be applied only where there is some degree of definiteness and discreteness. The nothing of negation is only a synonym for the ordinal number second and as such implies a First (6.217). The nothingness of the “pure zero,” or indeterminacy, is prior to any First. Pushed to its extreme, the nothingness of negation would be the nothingness of death; it would be the state of absolute Secondness in which everything would be


frozen solid. The nothingness of "pure zero" is the nothingness of not having been born.

There is no individual thing, no compulsion, outward nor inward, no law. It is the germinal nothing, in which the whole universe is involved or foreshadowed. As such, it is absolutely undefined and unlimited possibility—boundless possibility. There is no compulsion and no law. It is boundless freedom. (6.217)

Peirce likened this initial state to Aristotle's prime matter (6.206). Prime matter is *nec quid nec quale nec quantum*. Peirce's potential aggregate, however, has one property, spontaneity. For Aristotle, prime matter functioned as an individuating and limiting principle which has no reality at all apart from a relation to some form. It has no spontaneity apart from act. Peirce, then, seems to endow Aristotle's prime matter with a little *energeia* or act. 10

From pure indeterminacy nothing in particular necessarily results. Here Peirce departs from Hegel.

In this proposition lies the prime difference between my objective logic and that of Hegel. He says, if there is any sense in philosophy at all, the whole universe and every feature of it, however minute, is rational, and was constrained to be as it is by the logic of events, so that there is no principle of action in the universe but reason. But I reply, this line of thought, though it begins rightly, is not exact. A logical slip is committed; and the conclusion reached is manifestly at variance with observation. (6.218)

Hegel's slip was to think that because the universe is rational it is *constrained* to be as it is. According to Peirce, then, Hegel fell into the error of all necessitarians. He supposed the logic of evolution to

10 The schoolmen disputed over how prime matter should be conceived. Thomists generally held that it could not have any act whatsoever not even an act proper to itself. Suarezians generally held that prime matter has its own act. The difference is not a mere quibble. It determines to a large extent how these schools analyzed the notion of being and so affects their metaphysics at almost every point. Although the terms "act" and "potency" appear in both they do not have precisely the same meaning.
be "of that wooden kind that absolutely constrains a given conclusion" (6.218). Peirce points out that the universe's logic of development may be that of inductive or hypothetic inference. Hegel's mistake forced him to deny "the fundamental character of two elements of experience which cannot result from deductive logic"—spontaneity (Firstness) and arbitrariness (Secondness).

Although nothing in particular necessarily resulted from the "tohu bohu," something or other had to, simply because it is boundless spontaneity and freedom.

I say that nothing necessarily resulted from the Nothing of boundless freedom. That is, nothing according to deductive logic. But such is not the logic of freedom or possibility. The logic of freedom, or possibility, is that it shall annul itself. For if it does not annul itself, it remains a completely idle and do-nothing potentiality; and a completely idle potentiality is annulled by its complete idleness. (6.219)

There can be no potentiality which would never, somewhere and sometime, have the occasion to be actualized. To say that there were such a do-nothing potentiality would be to confuse potentiality with mere logical possibility. It would be to deprive potentiality of all its power and dynamism. There is, then, a kind of necessity in the first step in evolution but not that sort of necessity required by the determinists. For Peirce there must be some move or other (necessitas quoad exercitium), but no one in particular (necessitas quoad specificationem). Strict necessitarians would require that the specification be also determined.

Something or other, then, had to come from the original pure spontaneity just because it is pure spontaneity. But again, because

11 Aristotle and Thomas would agree, but they would say that the power and dynamism of real potentiality comes from some act with which it is associated. If this is what Peirce means, he is not very clear about it.

12 See T. A. Goudge, op. cit., pp. 172 ff., for a discussion of an ambiguity in Peirce's use of the term "probable deduction." Sometimes it refers to necessary inferences about probabilities; sometimes to conclusions which are only probable. Our distinction between kinds of necessity might throw some light on this ambiguity.
pure spontaneity has no order, nothing in particular had to appear —neither this, nor that, nor the other. Whatever did appear, appeared by pure chance. We are beginning to see that Peirce saw no inconsistency in saying that uniformity resulted from variety and that the original chaos had a certain uniformity about it. Clearly Peirce has in mind two quite different sorts of uniformity. The uniformity which requires explanation is that manifested in laws of nature. That sort of uniformity is manifested amid an actual multiplicity of instances. The uniformity of the original vague potentiality is a unity without any actual multiplicity at all. It is not the sort of thing which would lead us to expect from it anything in particular. Therefore, it would not cause any surprises and so would not lead us to ask questions. The sort of unity which raises questions is that which we find in multiplicity. The original continuum has only that unity which comes from lacking every determination. It has a unity, as it were, by default. As Peirce pointed out to Dr. Carus, this sort of “law” is entirely different from the rigid law of the determinists. It is the “law of freedom” and the basis of the law of mind.

When we think of chance we are apt to think of a random distribution of discrete units governed only by the laws of probability. Peirce once remarked that a world of chance in this sense would not be totally lawless. A random distribution of discrete entities, then, would not be entirely without order. Of course that order would only be accidental to the collection. The units in the collection could have been distributed some other way without affecting the collection. Nevertheless, Peirce seems to have thought the collection would have some order. Now as far as we can tell, the random distribution of a discrete collection is what Peirce meant by “quasi-chance.” The limit case of “randomness” is what Peirce calls “absolute chance” and it has no order whatsoever because it has no discrete parts. Quasi-chance simulates the indeterminacy of absolute chance and

... in a broad view of the universe a simulation of a given elementary mode of action can hardly be explained except by supposing the genuine mode of action somewhere has place. (6.613)

Peirce, then, takes the potential aggregate as the limit from which the evolutionary process began back in the infinitely distant
past. Once we have grasped this difficult notion, the rest of Peirce’s logical account is not too hard to follow. We must not forget, however, that it is a question of logical, not temporal, sequence. All our thinking is bounded by temporal conditions and so we must ever be correcting the tendency to transpose the temporality of our mental processes into the atemporal ordering of logical relations.

Peirce’s logical studies, of course, provided him with a set of ordered logical relations: Firstness, Secondness, and Thirdness. And, as we have seen, to these categories roughly correspond the modes of being: qualitative possibility, actuality, and law. Peirce can make use of these notions in his account of the origin of our existing universe. The spontaneity of the original vague potentiality assured that something or other would be actualized. Logic assures that the first articulation of that vague potentiality must be “Firstnesses” or qualitative possibilities.

Thus the zero of bare possibility, by evolutionary logic, leapt into the unit of some quality. This was hypothetic inference. Its form was: something is possible; red is something; therefore, red is possible. (6.220; cf. 6.194 ff.)

The first evolutionary move away from complete indeterminacy, therefore, was the emergence of the “World of Platonic Forms” by their inherent Firstness (6.198). Potentiality in general became particular potentialities.

It would be a mistake, Peirce insists, to think that these qualitative possibilities arose separately and only afterwards came into relation (6.199). If they had appeared on the scene in complete isolation there would be no way in which they could ever be related, since in themselves they are what they are independently of anything else. Once in isolation they would forever remain so, and then the “Platonic World” would be atomic and static. No further development would be possible (cf. 6.222–237). Consequently, we must assume that they sprang up already reacting upon one another. In that case, Peirce can say that they have a sort of existence (6.199), something like the existence our ideas have in our minds.

Logic further requires that every potentiality have actual instances at some time or other, somewhere or other. Peirce can argue, therefore, that a necessary condition for the move from vague
potentiality to definite potentialities is that these definite potentialities have at some time actual instances. Our existing world is one locus of the actual instances of some of the "Platonic forms." Concrete actuals, however, in our world at least, never exhibit only one quality. Each is an actual instance of several potentialities. The instances, then, can be thought of as at the intersection, or points of interaction, of the forms. We may conclude that the springing up of potentialities in reaction one to another is a condition for there being concrete instances, just as concrete instances are a necessary condition for real potentiality. The universes of potentiality and of actuality, therefore, are interdependent although distinct in the same way as Firstness and Secondness.

If we recall what Peirce had to say about law, we see that the relationship between potentialities and their actual cases defines law. Brute interaction can be conceived as taking place between individuals, but not between individual and type. The only way in which an individual can come under a type is by a law. Thus the universe of law is a logical condition for the other two. All the universes, then, are inseparably bound up although distinct, just as are the categories. They can be prescindied one from another in a definite logical sequence. Notice, however, that the order of involution and that of evolution are just the opposite. Thirdness or law involves Secondness or actuality and Firstness or potentiality; but potentiality evolves actuality and these two together evolve law. As far as temporal sequence is concerned all three universes appeared at once since time itself arose with them.

We must now say something about the limit toward which our universe is evolving. It must be a state in which the reign of law is at a maximum. This does not mean that the universe will ever grind to a halt or become frozen in a "heat-death." When Peirce does describe the limit in these terms (cf. e.g. 8.317), he knows it will never be reached. In one place he characterizes this ultimate condition as the Absolute Second and likens it to "God completely revealed" (1.362), thinking perhaps of Hegel's Absolute Spirit absolutely articulated. At this limit, there would be no spontaneity and so no mind. The Absolute Second is the antithesis of the Absolute First.

There are several reasons why the Absolute Second will never be reached. First, since the primordial potentiality can never be ex-
hausted, all spontaneity cannot cease (1.615). Second, no general
can ever be completely embodied by actuals. Third, perhaps not en-
tirely distinct from the other two reasons, the law of mind cannot be
self-destructive (6.148), for if it were, the very growth of concrete
reasonableness would be its undoing. Reason would destroy itself in
and through the very process of its development. Reason would, then,
be acting in a most unreasonable way.

Peirce’s criticism of absolute determinism really comes down to
saying that such a view admits that the Absolute Second will be
reached. More accurately perhaps, it says that the universe is always
in a state of absolute Secondness. According to Peirce, the absolute
determinist cannot, consistently with his own principles, admit
growth, variety, and diversity, and so he charges that observational
data not only do not support such a position but are against it.

As we have seen in an earlier chapter, Peirce does not claim that
a sudden end of everything is inconceivable, but again there is no
positive evidence to support such an hypothesis (4.547). He told us
that there might be material laws of nature against everything coming
to a halt tomorrow, but that the notion itself is not self-contradictory.
It is conceivable, for instance, that some force transcending our world
might destroy it. Still, mere logical possibility is not a sufficient ground
upon which to base an hypothesis. Consequently, Peirce is convinced
that tomorrow is destined to come—and another tomorrow and an­
other into the indefinite future.

Between the limits of vague potentiality and absolute fixity evolu­
tion goes on. Through the tendency to generalize, the universe is
growing and developing. It is becoming more and more organized
and subject to the law of mind. Evolution is Reason progressively
manifesting itself. Reason, for Peirce, consists in its governing indi­
vidual events and without those actual facts it would have no reality
at all. It consists in being continually embodied in fact. It follows,
then, that Reason can never be fully embodied since no number of
events of actual facts can ever fulfill its potentiality.

So, then, the essence of Reason is such that its being never
can have been completely perfected. It always must be
in a state of incipiency, of growth. It is like the character of
a man which consists in the ideas that he will conceive
and in the efforts that he will make, and which only develops as the occasions actually arise. Yet in all his life no son of Adam has ever fully manifested what there was in him.

So, then, the development of Reason requires as a part of it the occurrence of more individual events than ever can occur. It requires, too, all the coloring of all qualities of feeling, including pleasure, in its proper place among the rest. (1.615)

Reason, then, is the working out of ideas in the world. And for Peirce the growth of concrete reasonableness is the admirable in itself.

Peirce's cosmological speculations and his pragmaticism come together in a striking way in his evolutionary ideal. The course of evolution itself, the growth of concrete reasonableness, becomes the *summum bonum*, the highest norm. He has found the object of esthetics, and through contemplation of it, he feels that man can deliberately form habits of feeling in accord with it. In terms of this highest good, man can determine what are to be his ideals of conduct, for he has found his place in the universe.

Man, then, holds a privileged and unique place in this evolving world. Although he himself is a product of that process of development and still is in great measure subject to it, he has reached a stage where he is capable of a very high degree of self-control. It is this superior degree of control which sets him apart from other animals;

... it is by the indefinite replication of self-control upon self-control that the *vir* is begotten, and by action, through thought, he grows an esthetic ideal ... as the share which God permits him to have in the work of creation.

(5.403, n. 3)

Man has evolved to a point where he now can cooperate in the process of evolution itself, since he can deliberately control his own actions and influence the community of which he is a member. He may choose to further as best he can the growth of concrete reasonableness in the world and so fulfill himself, or he may decide to act perversely and so succeed in destroying himself. He cannot completely frustrate Nature for he is still subject to her. Reason will continue to embody itself with or without him, but he is privileged to cooperate in that
process consciously and willingly. Man needs norms to guide his de-
liberate conduct and those norms he finds in and through the universe
which he knows and experiences—the universe which he knows and
experiences because he arose out of it and is a part of it.

I do not see how one can have a more satisfying ideal of the
admirable than the development of Reason so understood.
The one thing whose admirableness is not due to an
ulterior reason is Reason itself comprehended in all its
fulness, so far as we can comprehend it. Under this
conception, the ideal of conduct will be to execute our little
function in the operation of the creation by giving a hand
toward rendering the world more reasonable whenever, as
the slang is, it is “up to us” to do so. (1.615)13

13 Peirce came to acknowledge the embodiment of Reason as the
summum bonum through a contemplation of the universe’s structure. The
interplay of the modes of being bringing about the cosmos’ development
struck him as something admirable in itself. We wonder whether or not
this is the sort of thing he had in mind when he spoke of “musement”
through which, he thought, one would be convinced of God’s reality. In
any case, he certainly held that “musement” on the interrelation of the
“three Universes” would bring one to that hypothesis, which “. . . the more
he ponders it, the more it will find response in every part of his mind, for its
beauty, for its supplying an ideal of life, and for its thoroughly satisfactory
explanation of his whole threefold environment” (6.465; cf. 6.452–493).