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CHARLES SANDERS PEIRCE

PEIRCE AS A PHILOSOPHER

CHARLES S. PEIRCE called himself, in his later years, simply a logician. That he was a philosopher he fully recognized. But the term logician seemed to him more apt for a person engaged in the researches to which he was most devoted. For Peirce, rightly, logic would constitute the best possible foundation for a sound philosophy. But most philosophers, as he very correctly saw, were not logicians and would not be likely to become such until some very great reform occurred. Peirce united very wide knowledge of the history of philosophy with a generally fair-minded disposition to a discriminating criticism of philosophers, and with a capricious, though generally very well restrained interest in philosophical polemic, whose arts he regarded with a general skepticism and pursued with a usual moderation. But all the more he felt that the name logician stood rather for what the philosopher ought to be than the name philosopher for what a well-trained logician was most likely to be. So it was as logician that he wanted to be judged.

Nevertheless he was a philosopher. Like a good many other recent philosophers, he desired his philosophy to be what is so often called scientific. He desired that the methods of the various natural sciences, and in particular of the most exact natural sciences, such as physics and chemistry, should be the models of his philosophical speculations. He had a better right to use the term scientific philosopher than is customarily the possession of those who use this term. His early training here in Cambridge, in his father's house and in the Lawrence Scientific School, was, first, in mathematics (since his father, Professor Benjamin Peirce, the elder, was one of the greatest American mathematicians). Peirce was fond of saying that he grew up in a laboratory. Later, he did some good work in the observatory. Still later, he was busy with the conduct of a good many statistical researches in connection with the Coast Survey. He was early and long familiar with exact measurement, and with the

theory and practise of the determination of the errors of measurement in the measuring sciences. So, when he spoke of being a scientific philosopher, he was not without a really close knowledge of what scientific method in philosophy ought to mean. That in addition he did not fail to appreciate some at least of the great historical thinkers was due to his wide, manifold, and in some respects, very thorough erudition—an erudition that remained, like many other of his personal possessions, somewhat capricious, despite its frequent thoroughness. At any rate, whether he worked in any one of his publications rather as logician or as general philosopher, Peirce had no interest in founding a school, belonged to none of the existing schools, had a wide range of appreciation for other minds, and a very great disposition to bind inductive methods with speculative interests.

That Peirce should be classed amongst the evolutionists is, for many reasons, natural. His early education was finished, and his maturer scientific work begun, in the great decades of the modern evolutionary movement. His principal contribution to fundamental logical theory, that is, his own highly technical definition of the three categories or modes of being,[1] which he made fundamental in all his speculations, was published in the year 1867 in the "Proceedings of the American Academy of Arts and Sciences in Boston." His essays on scientific method in the *Popular Science Monthly* were printed in the early seventies,—I believe from 1873 to 1876. "The Studies in Logic," by the members of the Johns Hopkins University, a book composed partly by himself and partly by his advanced students in logic at Baltimore, was published in the early eighties. Thus, his work brings him into close contact with the formative period of the modern doctrine of evolution.

But Peirce was never a follower of Spencer, whose relation to natural science was not such as seemed satisfactory to a mind of Peirce's type and training. Nor was Peirce very prominently influenced by Darwin, although, of course, he knew Darwin well. For Peirce was, once for all, a man rather of physical and chemical training and of practise in the use of various instruments of precision, than a man at all carefully trained in the biological sciences. His interest in human nature was wide and varied, and, in his fragmentary way, he contributed notably to the study of various psychological problems—in particular, to problems relating to the threshold of sensation, and to various other problems of the psychology of perception.

[1] (1) Things, that is, individuals; (2) objects of conception, that is, universals; and (3) signs. Peirce often mentioned, in conversation, these "three sorts of being" as the essential feature of his philosophy.

The "evolution" of Peirce was therefore no variation of the evolutionary philosophy of Spencer or of Spencer's disciple, Fiske. Such minds left him uninterested. History, and especially the history of thought, and in particular of the various natural sciences, interested Peirce deeply. But his mind, when he thought of evolution, turned its attention to the matters which most fascinated him as a logician. He wanted to know not merely about the evolution of any one group of physical phenomena, whether stellar or terrestrial, whether organic or inorganic. He wanted to know about how the laws of nature came to be what they now are. For him the doctrine of evolution was to be, if it should succeed at all, a doctrine of the evolution of the laws of nature, a doctrine regarding how the world came to acquire not the plants, nor the animals, nor the solar systems, nor the Milky Way, that now it has, but how the laws of nature came to be what they are at all.

Peirce's speculations upon these topics were very highly original, were continued over a period of very many years, were perhaps the most characteristic productions of his whole personal character and mental interest which, apart from his technical logical researches, we possess. These speculations very greatly interested William James and played their part in the formulation of that whole "philosophy of change" on which William James's latest interests were most centered. Yet to James the principal illustrations of this doctrine of the evolution of natural law always remained unfamiliar and somewhat too technical, so that James listened, in company in which I was sometimes privileged to be present—listened, I say, to these aspects of Peirce's philosophy with an interest which certainly did not follow Peirce's thought into precisely those regions which Peirce himself most valued. The ideas here in question are so manifold and complex that I can not hope to give you any adequate idea of them. Let me simply indicate a few of them.

Most philosophers, if they concern themselves with the laws of nature at all, begin by regarding certain fairly simple laws, as, so to speak, the only examples of canonical and legitimate sorts of natural law that we ought to recognize. Mechanical laws or exactly quantitative laws or formulas capable of precise natural formulation, these such philosophers regard as the reasonable sorts of law. In case a man does not believe that these types of law are universal, are pervasive, or are canonical, his philosophy is usually likely to be some sort of teleology, or some doctrine that freedom, or that spiritual significance rules the world, and that exact law is subordinate to more or less sentimentally conceived ideals.

But Peirce's philosophy was dominated by quite other modes of

thinking whose origin lay partly in his experience in dealing with the problem offered by the efforts of science to eliminate or to reduce to rule the errors which are encountered in the actual measurements which the physical sciences endeavor to make. Partly his ideas on these subjects were due to still more general logical considerations which influenced him greatly from the time they first met his notice. The laws of nature that we actually confirm—so Peirce was accustomed to say—are laws which, so far as we can verify them, are *approximately* true. All measurements are inexact, and have to be corrected by further measurements. The moon which astronomers observe, especially if the observations extend over many centuries, as, by the study of the records of ancient eclipses we can make them extend—the moon of observation—never agrees precisely with the ideal moon which the astronomical theory demands. Of course as astronomical knowledge grows toward perfection, the discrepancy between theory and fact grows less. That is simply because the better we know nature, the more we can discover how to adjust theory and fact, one to the other. But if we extend our survey of nature from the instant to the year, from the year to the century, from the century to the geological period, or to the evolution of a stellar system, we get evidence that natural laws which hold with appreciable exactness and within the errors of probable observation, during short periods of time, no longer hold with such precision for very long periods of time. There is a reasonable inductive evidence that the laws which nature follows are themselves only approximately true and are subject to evolution, so that Newton's law of gravitation is presumably very nearly true at the present time for the present moon and planets, for the present stellar systems. But it is equally probable that this law is even now only a close approximation, not an absolutely necessary order of things. For similar inductive reasons, it becomes probable that, in so far as Newton's law of gravitation now holds true, it did not always hold true, and that this, like all other laws of nature, is a product of evolution.

What an inductive study of nature makes probable, Peirce was accustomed to regard as what the rightly trained mind of the logical student of nature would regard as that which would be likely to be characteristic of a nature in which evolution has taken place. For Peirce rejected, upon logical grounds, the doctrine that the natural world or any other portion of the universe known to us, must necessarily be subject to any *a priori* laws, except the purely logical ones, or to a perfectly exact law of causation. Regularity, as Peirce was especially fond of saying, is not necessarily a self-evident type of any real world which is known to us. Regularity, where it exists and in

so far as it exists, is precisely that aspect of the world *which most stands in need of explanation*. If you find a pack of cards lying in confusion, you suppose that to be the natural result of their having been thrown down in a chance way by somebody whose dealings with them were governed by no necessary, rigid, or precise law. That is, the chance disorder of the pack of cards thrown down at random needs, on the whole, no explanation. But if you find the cards in some precise order, as, for instance, in the order required by a certain hand in a certain game, then you stand in the presence of a fact which needs explanation. You very properly and logically ask why they came to be in this order.

Precisely so the relatively chance order of the starry heavens in the region of the Milky Way calls for no scientific explanation. But if the planets conform to Kepler's laws, if the moon of astronomical theory approximately agrees with the moon of observation, it is, logically speaking, a fair question to ask why the planets and the moon behave thus, or, in evolutionary terms, how they came to do so.

Precisely so Newton's laws of motion, in so far as they are approximately true of the physical world, demand an explanation and an evolutionary explanation. If such can be hypothetically furnished, we thereby come to see why and how the Newtonian natural laws have come to characterize the real world.

Thus every sort of natural law, precisely in so far as it is approximately exact law, logically demands, if possible, an explanation in terms of the theory of the evolution of natural law. And, empirically speaking, as Peirce was never weary of insisting, there is a wide range of empirical evidence that the present laws of nature are the products of an evolutionary process. In this thought consisted the evolutionary theory of Peirce. A brief mention now of some of his other leading ideas must close this essay on his philosophy.

The second of Peirce's leading ideas dominated his highly remarkable and original version of inductive logic. I have sometimes ventured to call this doctrine by a name which Peirce himself, in some of his early papers, suggests by his illustrations, though I believe that he had never formally used it. This name is the "Insurance Theory of Induction." I have no time to expound it here. It was originally set forth in the series of articles in the *Popular Science Monthly* entitled "Illustrations of the Logic of Science."

The third leading idea of Peirce's philosophy to which I wish to direct attention results from his theory of the evolution of natural law, and expresses the result of his most synthetic survey of cosmological problems. This is the theory according to which chance is objective, and the whole universe expresses a process that has two

extremes, with chance as a limit towards one end and rigid necessity as a limit at the other end of an endless temporal process.

The fourth of Peirce's leading ideas relates to the teleological and mental aspect of the world, that is, to the idealistic tendency which formed a motive in Peirce's thought, but which never became amplified in a dogmatic idealistic metaphysics. This idea had a certain similitude to ideas which Bergson has recently made interesting, though there is never very close agreement between Peirce's ideas and those of Bergson. But Peirce has his own theory as to the part which intuition plays in the work of the human mind and in the guidance of scientific research. Peirce's thoughts on this subject are fragmentary. Indeed his entire life work may in a certain sense be called fragmentary. Yet it is my belief that his ideas will amply repay study. As he himself says in the conclusion to that brilliant essay, "The Architecture of Theories,"—"may some future student go over this ground again and have the leisure to give his results to the world."

The Peirce Manuscripts

All the remaining papers of Peirce have now been placed under the joint care of the Harvard department of philosophy and of the Harvard library. The papers are in many ways fragmentary, but may be regarded with confidence as containing some very important things. We have also in our possession copies of his various published essays, which are also somewhat fragmentary and which in their orginal publications were pretty widely distributed in various journals and learned transactions. A word about these seems in order before passing on to a description of Peirce's unpublished papers and manuscripts.

Of Peirce's published works the most important from a purely scientific standpoint was a photometric research upon a group of stars selected for that purpose by Professor Pickering, the results of this research being still valuable, despite the changes in modern methods which have taken place in the field.

Another contribution of Peirce's to the world's storehouse of scientific knowledge is none the less valuable because it is generally unknown. I refer to the scientific vocabulary of the first edition of the Century Dictionary, of which Peirce was the author in so far as that portion of the Century Dictionary had any one author at all. Peirce's vast erudition in the history of science and particularly his familiarity with scholastic philosophy to which he was long devoted made his work as a dictionary-maker exceedingly valuable.

Nearer to philosophy one comes perhaps when one speaks of Peirce's researches on the algebra of logic and in particular in the

logic of relatives. Many of the most recent researches, including those of Bertrand Russell, are still due to his influence, although Russell, as I think, has a somewhat inadequate sense of his own generally indirect indebtedness to Peirce's work in this field. The logical essays of Peirce which deal with synthetic logic and with the logic of relatives were collected and brought into a sort of a synthesis by Schroeder. A list of them can be found in Schroeder's "Algebra der Logic" (Appendix to Vol. 1).

Distinct from these researches in exact and, in general, in deductive logic are Peirce's manifold contributions to the logic of induction. The most important essays of Peirce in this field appeared in the early seventies of the last century in the *Popular Science Monthly* under the general heading of "Illustrations of the Logic of Science." Of the researches of Peirce on this subject, I do not hesitate to say that they are still very imperfectly appreciated and are of enormous importance.

As is well known, William James considered Peirce as the father of pragmatism. Yet what little Peirce published on this subject will go to bear out the remark that there is little in common between his pragmatism and that of James. Peirce's *Monist* article entitled "The Issues of Pragmaticism" was written for the express purpose of maintaining the independence of his thought from either the pragmatism of James or the humanism of Schiller. The word practicism seemed to him best to describe the philosophy of these two thinkers. As for Peirce himself, when he saw his pragmatism threatened with too much popularity he found it easy to take refuge in a new word, namely, "pragmaticism" which, as he liked to say, "seems ugly enough to escape the kidnappers."

It is not always easy to understand Peirce. He never regretted the fact that most people found it hard to follow his ideas. He deliberately chose that most of his researches should be concerned with highly technical topics and should be secure from the intrusion of the uncalled. Upon occasion he could be brilliantly clear in his expressions of highly complex and recondite problems, although this clearness was a capricious fact in his life and in his writings, and was frequently interrupted by a mode of expression which often seemed to me to be due to the fear, after all, that in case mediocre minds found themselves understanding too many of his ideas, they would be led to form too high an impression of their own powers. One finds this tendency towards what might be called "impenetrability" especially evident in his manuscripts. Too often the reader meets with a thought of surpassing brilliancy and follows it eagerly, only to have it disappear like the cuttlefish in an inky blackness of its own secretion.

The most complete manuscripts of the Peirce collection include copies of the "Lectures on Pragmatism" which were delivered privately to a circle of friends in Cambridge and of the Lowell Lectures on Logic of 1903–4. It was these latter which James described as "flashes of brilliant light relieved against Cimmerian darkness—"darkness" indeed to James as to many others must have seemed those portions on "Existential Graphs" or "Abduction." Yet it seems strange that the very striking lectures on "Induction," "Probability," "Chance," and "Multitude" should have attracted nothing more than a passing notice.

The two works, which, if they could ever have been completed, were intended by Peirce to be the proper fruits of his studies, were a "History of Science" and a "Comprehensive Treatise on Logic." Both of these remain unfinished; and the value of his fragmentary manuscripts will largely depend upon the extent to which future editorial work can bring into unity the very considerable fragments which his remains contain of the studies which were intended to form part of these works. So far as his erudition and inventiveness were conditions for the writing of these two intended books, Peirce possessed both these characters most abundantly. No greater mind has ever appeared in America in respect of the powers needed for the writing of these two projected works. No more ample erudition has ever existed amongst us regarding the topics which were here in question.

Of especial importance from an historical standpoint are the writings of Peirce which deal with Aristotle and with the scholastic philosophy. Aristotle, Peirce read in the original carefully and for many years, and his manuscripts contained many original expressions of his independent opinion about the problems connected with the interpretation of the Aristotelian philosophy. For the scholastic philosophy Peirce always had a very great interest. Duns Scotus was among his favorites, both as logician and as metaphysician. He was not attracted to the Scholastics by any of their theological relations, but by an interest in their skilfully devised vocabulary, and in the beautiful array of their word conceptions. A treatise which I recently found among his manuscripts entitled "Duns Scotus and Occam" sets forth very clearly the issues of realism and nominalism in the light of modern thought and goes far towards showing that many contemporary philosophers, as, for instance, Bertrand Russell, are not so far away from scholasticism as the calendar might indicate.

The following constitutes a list of the titles of the more important among the Peirce manuscripts. It is far from being complete, yet it may serve to suggest the varied and in many respects original nature of Peirce's philosophical and scientific researches.

"On Retroduction, Induction, and Abduction." "Minute Logic." "Treatise in Logic": Chapter I, "Prelogical Ideas"; Chapter IV, "Ethics"; Chapter VI, "The Three Kinds of Signs"; Chapter VII, "The Aristotelian Syllogistic"; Chapter VIII, "The Algebra of the Copula"; Chapter XI, "On Logical Breadth and Depth"; Chapter XIII, "Simplification of Dual Relatives"; Chapter XIV, "Quantification of the Predicate"; Chapter XV, "Existential Graphs." "Synechism." "Lectures on the British Logicians." "Positivism." "Aristotle on Categories." "Molecules and Molecular Theory." "Prospect of Air Sailing." "On Representation." "On small Differences in Sensation." "Notes on Royce's World and Individual." "Illustrations of Dynamics." "Theory of Numbers." "Refutation of Transcendentalism." "*A Priori* and *A Posteriori*." "The Seven Systems of Metaphysics." "Quantity and Quality." "On Multitude and Number." "Logic of History." "Lectures on Kant." "On Mind and Matter. "Logic of Continuity." "On the Associations of Ideas." "Spinoza." "Hume—a Critical History of Logical Ideas."

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THE PRAGMATISM OF PEIRCE

THE term pragmatism was introduced into literature in the opening sentences of Professor James's California Union address in 1898. The sentences run as follows: "The principle of pragmatism, as we may call it, may be expressed in a variety of ways, all of them very simple. In the *Popular Science Monthly* for January, 1878, Mr. Charles S. Peirce introduces it as follows:" etc. The readers who have turned to the volume referred to have not, however, found the word there. From other sources we know that the name as well as the idea was furnished by Mr. Peirce. The latter has told us that both the word and the idea were suggested to him by a reading of Kant, the idea by the "Critique of Pure Reason," the term by the "Critique of Practical Reason."[1] The article in the *Monist* gives such a good statement of both the idea and the reason for selecting the term that it may be quoted *in extenso*. Peirce sets out by saying that with men who work in laboratories, the habit of mind is molded by experimental work much more than they are themselves aware. "Whatever statement you may make to him, he [the experimentalist] will either understand as meaning that if a

[1] See article on "Pragmatism," in "Baldwin's Dictionary," Vol. II., p. 322, and the *Monist*, Vol. 15, p. 162.