

Charles S. Peirce  
Self-Biography

*A Brief Intellectual Autobiography*

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CHARLES Santiago Sanders Peirce (b. 1839), son of the mathematician Benjamin P., brought up in a circle of physicists and naturalists, and specially educated as a chemist, derived his first introduction to philosophy from the K.d.r.V. and other celebrated German works, and only later made acquaintance with English, Greek, and Scholastic philosophy. Accepting unreservedly Kant's opinion that the metaphysical conceptions are merely the logical conceptions differently applied, he inferred that logic ought to be studied in the spirit of the exact sciences, and regarded Kant's table of Functions of Judgment as culpably superficial. He also thought that Kant's reply to the question how are synthetical judgments *a posteriori* possible was altogether insufficient, and that an exact inquiry into it would probably throw some light upon judgments *a priori*. Appointed in 1864 Lecturer on Logic {P 16} in Harvard University, he divided all reasoning into, 1st, the deductive, including all necessary inference together with all probable inference to which the calculus of probabilities is properly applicable (rejecting inverse probabilities not founded on positive information), 2nd, the inductive, including all experimental testing of hypotheses (for he considers a physical experiment to be in a general sense of the same nature as a geometrical reasoning, which is performed by internal experimentation) but excluding, 3rd, the "abductive," or the process of forming and accepting on probation, a hypothesis by which to explain surprising facts. He put forth a "critic," or mathematical deduction of the validity of these modes of reasoning, founded upon the principle that nothing is subject to logical (any more than to ethical) criticism except so far as it is subject to self-control. What one does not in the least doubt one should not pretend to doubt; but a man should train himself to doubt. His account of validity of induction is that its premisses do not lend the slightest probability to its conclusion, but that we are justified in provisionally accepting the conclusion by the postulate that any error in that conclusion will ultimately be corrected by the further application of the same method. This postulate will only be true if the inductive conclusion be understood to be limited to a "possible experience" (a Kantian conception modified) of future similar experiments. But he already held it to be impossible to conceive anything otherwise than as an object of possible experience, and that of the kind that "experiment," or purposive arrangement of conditions, may bring; and in 1877, in two articles in the *Revue philosophique* {P 129, 162}, he put forth the doctrine he called *Pragmatism*, namely, that every concept (as distinguished from a generalized sensation, such as 'red') is equivalent to a conditional purpose, should one have certain desires and certain types of experience, to act in a certain general way. In 1867, he published in the 'Proceedings of the

American Academy of Arts and Sciences' of Boston, five papers {P 30-34} in which he professed to limit himself to incontrovertible assertions. In one of these, 'On the Classification of Arguments' {P 31} (partly repeating a paper he had distributed {P 18} the year before) he undertook to reduce all inference to *substitution* (an idea adopted afterwards by Taine and Jevons) without, however, maintaining that substitution was an elementary operation; and indeed he subsequently showed that the substitution of B for A is never logically justified unless it be justifiable first to insert B and unless it be subsequently justifiable to omit A. This paper also studied the relation between particular judgments and negative judgments. Another of the papers of 1867 proposed a new list of categories {P 32}, which will be given below.

In 1868 he contributed three papers {P 26, 27, 41} to W. T. Harris's 'Journal of Speculative Philosophy' in which he endeavored to prove and to trace the consequences of certain propositions in epistemology tending toward the recognition of the reality of continuity and of generality and going to show the absurdity of individualism and of egoism. In 1870, he published, in the Memoirs of the American Academy of Arts and Sciences, an extension of the Boolean algebra of logic {P 52} to render it applicable to the logic of relations, and developed this branch of logic somewhat further than DeMorgan had done. Especially he demonstrated that all relations between four or more correlates are reducible to compounds of triadic relations, while triadic relations can never be defined in terms of dyadic relations exclusively. In the North American Review for October 1871, in a review of Frazer's edition of Berkeley's Works {P 60}, he argued in favor of Scotistic realism.

In 1877-8 he published a series of articles in the Popular Science Monthly {P 107, 119, 123} (two of them appeared also in the Revue Philosophique {P 129, 162}) in which he enounced the principle he called *pragmatism*, that is, that every concept (in contrast to qualities of feeling, images, experiences, etc.) is definable in terms of a possible purpose of conduct under hypothetical general conditions, and that from this can be deduced the best rule for rendering ideas clear, namely, "Consider what effects that *might conceivably* have practical bearings we conceive the object of our conception to have; then, our concept of those effects *is* the *whole* concept in question." But since P not 'Only admits the difference between a commensurable and an incommensurable length, but has specially insisted upon abnumerable (abzählbar) multitudes (this had better be translated *Menge* though incorrectly, because students of philosophy would not know the correct term *Mächtigkeit*) it is evident that he understands "conceivably practical bearings" in a peculiarly wide sense. In the same articles he discussed the "uniformity of nature" {P 122} and undertook to demonstrate that while it afforded opportunities for inductive reasonings, it does not constitute the general ground of validity of such reasonings. He also argued that as a fact there appears to be as little orderliness in the universe {P 122} as we can conceive that a universe should have, and further that the degrees of orderliness of the universe is relative to the mind that contemplates it, consisting merely in the breadth (Umfang) of that mind's interests. In 1880-3, while lecturing on logic in the Johns Hopkins University, he developed in several papers in the American Journal of Mathematics, a theory of necessary reasoning {P 167}, a paper on the logic of number {P 187} in which he distinguished between

finite and infinite -collections in substantially the same way that Dedekind did six years later, and by means of the conception of correspondence, which is Gauss's conception of the *Abbild* (employed also by P in his Quincuncial Projection of the Spheroid {P 135, also 183} of 1879), he deduced the validity of the Fermatian inference {also P 187} (sometimes unsuitably termed mathematical induction). He also produced a general algebra of logic {P 296} in which subscript letters are attached to letters on the line signifying relations, these subscripts indicating individual correlates, while the letters  $\Sigma$  and  $\Pi$  with the same subscripts show whether the individuals are to be selected universally or existentially, that is, by the interpreter of the proposition or by the utterer of it. He further produced an algebra of dyadic relations {P 268} to which the third volume of Schroeder's *Algebra der Logik* {O 435(I), O 468(11), O 610(III)} is devoted; but P is not so entirely satisfied with that method as Schroeder was. {cf. P 620, 637, 627, 449} He also distributed brochure entitled 'A Brief Description of the Algebra of Relatives' {P 220}. Closely connected with this is his edition of his father's book called "Linear Associative Algebra." To a volume of papers by his students entitled 'Studies in Logic' {P 268} (Boston, 1883), some of them contributions of prime importance, he contributed a note on the algebra of dyadic relations, and a discussion of the validity and rules of scientific induction. He rests this wholly on the principles of the calculus of probabilities, yet denies that the inductive argument lends the slightest probability to the conclusion, and refutes the principle of inverse probabilities as applied by Laplace without statistical information. He makes the justification of induction to consist in the fact that if the conclusion is erroneous, the same method, persisted in further, will bring a correction of it. In 1884, he presented to the United States National Academy of Sciences, a memoir {P 303} in collaboration with his student, J. Jastrow, describing experiments which show that there is no Differenz-Schwelle in sensation, or that if there be it is almost incredibly small. The philosophical interest of this consists in part in its bearing upon *Synechism*, or the principle of universal continuity, which does not mean that there is no discontinuity, which is involved in all existence. It was also shown by these experiments that a perception might be so slight (*petite*, Leibniz), that the greatest effort of attention under the most exceptionally favorable circumstances would fail to make the subject aware of it, so that he could answer the question which of two alternative characters it had, and yet if the subject was required to answer at random, in 60 percent of the cases his answer agreed with the objective fact. Upon this phenomenon, P, in 1887, in a communication {P 352} to the American Society for Psychical Research, based an attack upon the book called 'Phantasms of the Living,' and was drawn into a considerable controversy with Mr. E. W. Gurney, which is printed in the Proceedings of that Society {O 353, P 354, O 381, also P 640}. The same year he contributed a paper {P 347-8} on the evidences of immortality to the volume 'Science and Immortality,' Edited by S. J. Barrows, Boston: 1887, in which he expressed the opinion that current views of cosmology, especially those of Spencer, were unsound in being too thoroughly mechanical. {cf. P 474, 525} But he thought there was no extant evidence for immortality unless the catholic miracles be admitted to be such. In 1891-3, in the 'Monist', {P 439, 474, 477, 480, 521, 525} he outlined a hypothesis capable of being subjected to inductive

tests, which hypothesis, called *tychism*, was that the laws of nature, although real, are results of a process of evolution, and as such are not yet and never will be exactly fulfilled by the facts, which depart from the laws in the same way, although vastly less than, observations do. He had intended to complete this series of papers by one or more concerning *Synechism*, but was not encouraged to do so. In 1896 in two articles {P 620, 637} in the 'Monist' reviewing Schroeder's *Algebra der Logik*, he described a logical method called *entitative graphs*, using diagrams instead of algebraic symbols. He also considered the foundations of the logico-mathematical doctrine of multitude, the so-called 'cardinal numbers' of G. Cantor, and proved that every multitude is exceeded by another multitude and that the infinite multitudes form a single simple wohlgeordnet series, or as he would say in English, a simple Cantorian series. Beyond that series the individual members of collections lose their separate identities in consequence of becoming essentially indefinite, and the multitude passes into continuity. In 1901 in a review {P 802} of the first three chapters of Pearson's 'Grammar of Science,' in the *Popular Science Monthly*, P argued for the reality of natural law and against the doctrine that we reason from 'first impressions of sense.' In 1903, in connection with a course of lectures {P 1005} on Logic before the Lowell Institute in Boston, he wrote a 'Syllabus of Logic', {MS 478; P 1035} but it was only in part printed owing to the small fund for the purpose. In the same year he gave a course of lectures {P 1004} in Harvard University on *Pragmatism*. In 1905 he expects to publish one article (and hopes that more may be accepted) in the 'Monist' on Pragmatism. {More were published: P 107780, 1124, 1126, 1128, 1171, 1193.} P wrote all the philosophical definitions in the *Century Dictionary* {P 373}, and some of these relating to logic in Baldwin's *Dictionary* {P 761-78, 806-970}.

Although Peirce is much given to raising doubts about his own philosophy, yet the alterations it has undergone since 1866, except for the introduction of the problematical tychism and a few minor corrections (of which the most important relate to the precise nature, definitions, and grounds of validity of induction and abduction), and an increasing insistence on the exclusion of psychological premisses from logic, consist in the extension of his inquiries to new problems and the greater fullness of his positions. In order to understand his doctrine, which has little in common with those of modern schools, it is necessary to know, first of all, how he classifies the sciences. He divides all science into Science of Research, Science of Review (comprising such works as those of Comte and Spencer, and the doctrine of the classification of the sciences itself), and Practical Science. That of the third branch, though elaborately worked out, need not detain us; and that of the second has not engaged his attention. The classification of Science of Research is shown in outline in the following scheme.

MATHEMATICS

PHILOSOPHY

Phenomenology, or Ideoscopy {Phaneroscopy}

Normative Science

Esthetics Ethics

Logic {Semeiotic}

Speculative Grammar {Stechiotic}

Critic

Methodeutic {Speculative Rhetoric}

Metaphysics

IDIOSCOPY (Bentham), or SPECIAL SCIENCE

Physics

Nomological Physics, i.e. Physical Geometry, Dynamics, General Physics, etc.

Classificatory Physics, Chemistry, Crystallography, Biology, etc.

Descriptive Physics, Geognosy, Astronomy, etc.

Psychics

Nomological Psychics, i.e. General Psychology, Psychical Chrononomy, etc.

Classificatory Psychics, Special Psychology, Linguistics, Ethnology, etc.

Descriptive Psychics, History, Criticism, etc.

This classification (which has been worked out in minute detail) is to be regarded as simply Comte's classification, corrected. That is to say, the endeavor has been so to arrange the scheme that each science ought to make appeal, for its *general principles*, exclusively to the sciences placed above it, while for instances and special facts, it will find the sciences below it more serviceable. Mathematics merely traces out the consequences of hypotheses without caring whether they correspond to anything real or not. It is purely deductive, and all necessary inference is mathematics, pure or applied. Its hypotheses are suggested by any of the other sciences, but its assumption of them is not a scientific act. Philosophy merely analyzes the experience common to all men. The truth of this experience is not an object of any science because it cannot really be doubted. All so-called 'logical' analysis, which is the method of philosophy, ought to be regarded as philosophy, pure or applied. Idioscopy is occupied with the discovery and examination of phenomena, aided by mathematics and philosophy. It is extremely doubtful which of its two wings should be placed first. The three main branches of philosophy are distinguished as follows. Phenomenology considers the phenomenon in general, whatever comes before the mind in any way, and without caring whether it be fact or fiction, discovers and describes the elements which will invariably be present in it, that is, the categories. Normative science considers the phenomenon only so far as it can be controlled, compares purpose with performance, and ascertains the general principles of the relation between them. Metaphysics is still more special only considering the phenomenon in so far as it is a sign of what is real. [The first of] the three branches of normative science, or the science of the phenomenon in so far as it is controllable, philosophical esthetics (which becomes something very different from the study which the noun usually designates) [.]

studies the characters which will belong to the phenomenon so far as it is controllable, that is, the characters of what is aimed at. Thus, the question, What is the *summum bonum*, is regarded as an esthetical question. If pleasure be defined as that quality of feeling which is common and peculiar to all experiences that we desire, P is inclined to deny that there is any such thing as pleasure, and to think that that which is common and peculiar to such experiences is an intellectual character, the realization of the ideal, or reasonableness. Ethics studies in the controllable phenomenon the act and process of controlling it. This study is the very heart of normative science, and emphasizes more strongly than the others that dichotomy which is the constitutive characteristic of normative science. For it is the study of the controlled and the uncontrolled as they appear in effort and resistance. This abstract ethics which can derive no principle from metaphysics or from psychology can plainly have little in common with ordinary ethics. Logic is of a much more special kind for it studies the relation of the phenomenon to the essential character of the phenomenon as controllable, that is, its reasonableness, or embodying an idea. That which embodies an idea is a sign, and it is best to make logic the science of the general properties of signs. Since P maintains that every thought, percept, image, feeling, etc. is a sign[,] ordinary logic, so far as it can be separated from metaphysics and psychology will be included in the abstract logic. Finally, under the head of metaphysics will be included, not merely ontology, but also whatever philosophy can determine respecting causation, the freedom of the will, the connection of mind and matter, optimism or pessimism, immortality, theology, time and space, etc.

Peirce's studies of philosophy have mostly been concerned with phenomenology, logic, and some parts of metaphysics. In phenomenology, he is of opinion that there are two sets of categories, a long list and a short one; and he admits that there may possibly be still others. Though he devoted two years to the study of the long list, he attained no satisfactory results. The shorter list is called by [the] easily remembered designation of the *cenopythagorean categories*. These are *Firstness*, *Secondness*, and *Thirdness*. *Firstness* is the mode or element of being by which any subject is such as it is, *positively* and regardless of everything else; or rather, the category is not bound down to this particular conception but is the element which is characteristic and peculiar in this definition and is a prominent ingredient in the ideas of quality, qualitiveness, absoluteness, originality, variety, chance, possibility, form, essence, feeling, etc. *Secondness* is that mode or element of being by which any subject is such as it is in a second subject regardless of any third; or rather, the category is the leading and characteristic element in this definition, which is prominent in the ideas of dyadic relativity or relation, action, effort, existence, individuality, opposition, negation, dependence, blind force. Secondness has two grades, the *genuine* and the *degenerate* (just as a pair of rays is called a "degenerate" conic) and this is true in several ways. Every genuine secondness has two correlative aspects, of which one is more active or first, the other more passive or second; and these two together make a total secondness between two correlative subjects. There is a long chapter of these dichotomic distinctions of secondness. *Thirdness* is that mode or element of being whereby a subject is such as it is to a second and for a third; or rather it is the

characteristic ingredient of this definition, which is prominent in the ideas of instrument, organon, method, means, mediation, betweenness, representation, communication, community, composition, generality, regularity, continuity, totality, system, understanding, cognition, abstraction, etc. That the three categories are independent of one another is proved as follows. Secondness involves Firstness, but it is discriminated from it by the circumstances that we may consider non-relative characters of subjects neglecting their dyadic relations. But a dyadic relation cannot be a result of non-relative characters, since if it were so there would be, besides the possession of non-relative characters of two objects, some connection between these facts; and this would be itself a dyadic relation. So Thirdness involves Secondness and thereby involves Firstness too; but it can be discriminated from Secondness by the circumstance that Secondness may occur either with or without Thirdness. Thirdness cannot be reduced to Secondness and Firstness, since if this were possible every triadic relation could be expressed in terms of dyadic relations and of non-relative attributions. Now no triadic relation can be so expressed, for it would appear in such expression as a composite relation formed of dyadic relations. Now composition is itself a triadic relation. On the other hand, there is no independent Fourthness or more complex mode or element of being; since it is easily demonstrable that every tetradic relation consists in a compound of triadic relations. Thirdness is subject to two grades of degeneracy. All genuine thirdness has a mental character.

Logic is by P made synonymous with semeiotic, the pure theory of signs, in general. Its first part, speculative grammar, {cf. *New Elements of Mathematics*, Vol. 3, pp. 207-210} corresponding to stecheology (Elementarlehre), classifies and describes signs. A sign is anything, A, in a relation,  $r$ , to something, B, its *object*, this relation,  $r$ , consisting in fitness to determine something so as to produce something, C, the *interpretant* of the sign, which shall be in the relation  $r$  to B, or at least in some analogous relation. Thus, the sign involves the idea of a possible endless series of interpretations. In what relation this entire series, taken as a whole, stands to the object, B, depends upon circumstances.