

# Charles Sanders Peirce

## The Architect of Pragmatism

Cornelis de Waal on the man and his ideas.

In 1851, when he was only twelve years old, Charles Sanders Peirce discovered in his brother's bedroom a copy of Richard Whately's *Elements of Logic*. He immediately stretched himself on the floor and began reading. The young Peirce quickly devoured the book and from then on logic would remain his passion. He was not a dry, bookish logician, however. Peirce trained as a scientist and his mind was that of a scientist at work. As he liked to remind his readers (Peirce always wrote with the reader in mind), he developed his views on logic and philosophy in the laboratory.

The scope of Peirce's "laboratory work" is staggering and recalls the old Renaissance ideal of the homo universalis. During his long career at the US Coast Survey, then America's premier scientific institution, Peirce worked extensively on the calculation of the shape of the earth, swinging pendulums in many places and carefully measuring the minutest gravitational variations. He did pioneering work on the magnitude of stars and on the form of the Milky Way, and invented a new projection of the earth that gave a world map with a minimum distortion of the distance between any two points (the map was used during WWII for charting air routes). He was a pioneer in mathematical economy, did important work on Shakespearean pronunciation, engaged in experimental psychology, wrote several books on logic and mathematics (none were ever published), gave lectures on the history of science, developed a bleaching process for wood pulp, made calculations for a suspension bridge over the Hudson river, wrote more than 16,000 definitions for the twelve-volume *Century Dictionary* – including all the definitions for logic, metaphysics, mathematics, mechanics, astronomy, and weights and measures – and he was the first to use a wavelength of light to determine the exact length of the meter. Almost as an aside he invented the electronic switching-circuit computer. Till then all computing machines had been purely mechanical, as they would continue to be for more than half a century. Impressive as this list already is, it could easily be extended. Peirce's scientific work clearly shaped his philosophic views. The view for which he is most famous, namely his pragmatism, is to a large extent an outgrowth of the methods used in the sciences.

As was fashionable in the nineteenth century, Peirce spent much time and energy in developing a philosophical classification of the sciences. This classification is useful for sketching Peirce's philosophy and the role pragmatism plays in it. Defining science broadly as the activity of a group of men

and women who have devoted themselves to inquiring into truth for truth's sake, Peirce first divided science into mathematics and what he called "the positive sciences."

Mathematics, for Peirce, is the discipline that draws necessary conclusions from ideal or purely hypothetical constructions. Within pure mathematics, Peirce maintained, we do not care whether these constructions – or even their conclusions – apply to anything real. In this respect mathematics differs from the positive sciences, which aim to gain some positive knowledge about reality. More concisely, whereas mathematics, in its pure form, studies how things could be imagined to be, the positive sciences restrict themselves to discovering how things really are.

Next, Peirce divided the positive sciences into philosophy and the "special sciences." Thus, for Peirce, philosophy is part of science. We should keep in mind, though, that Peirce construed science in a very broad sense, which saves him from the narrow reductionism sometimes found among contemporary philosophers who are only satisfied when moral imperatives, erotic feelings, and all those other messy things people talk about, are reduced to the laws of physics. In contrast to the special sciences, which deal with specialized fields of study such as physics, neurophysiology or medieval history, philosophy studies the facts of everyday life in the most general sense possible. It uses no fancy equipment and needs no exotic travels. Philosophy, Peirce explained, takes a very close look at the facts that present themselves to us in every day and hour of our waking lives. Its purpose is to furnish us with a general conception of the world in which we live, which can act as a basis for the special sciences.

For Peirce, philosophy itself can be divided into three areas: phenomenology, the normative sciences, and metaphysics. Phenomenology is the most basic of the three. Its central task is to bring order to the manifold of phenomena that appear before the mind. One way of doing this is by inquiring whether there are certain general characteristics that can be found in all phenomena, no matter whether they are forced upon us by outward experience, highly abstract conclusions of theoretical physics, or colorful products of the most vivid nightmares. Such characteristics Peirce called categories, following the practice of Aristotle, Kant and Hegel. Peirce found only three categories and, in an effort to avoid any contamination with already existing metaphysical systems, called them firstness, secondness and thirdness.

Firstness is the pure presentness of the phenomenon, without any reference to anything or anybody that it might be

present to. As Peirce explained, it is the phenomenon “such as it is, utterly ignoring anything else.” A simple, self-effacing, positive quality of feeling – like that of a faint muscle ache after working out – would come closest to an experience of pure firstness.

Secondness is the category of resistance or struggle. This category is also found in all phenomena. Whereas firstness involves only the phenomenon in isolation, secondness always involves something else, to which it is a second. However, it concerns otherness only in its purest form, that is, without any notion of a relation between the two, as a relation would inevitably introduce a third element, namely that relation. Being struck in the back of one’s head by a stray baseball would come close to the experience of unmediated otherness, or pure secondness. It is this experience of pure secondness also that shows us that life is not ‘all but a dream.’

To specify a relation between two objects, say between the baseball and the subsequent headache, is to introduce something new that, according to Peirce cannot be reduced to the objects that are related. Hence, there must be a *third* category, that of mediation. Peirce rejected the idea that relations could be reduced to properties of the objects related, leaving only two objects with their properties. He argued that even if a relation can be successfully reduced to the properties of the objects related, we still need to ask the deeper question of how those properties are related to the objects in which they are said to inhere. In short, the need for a third category remains wholly in place.

It is the acceptance of this third category that separates the *realists*, with whom Peirce aligned himself, from the *nominalists*. The debate between nominalists and realists, a debate that according to Erasmus even led to fistfights among medieval philosophers, plays a prominent role in Peirce’s thought. Whereas the nominalist claims that only individuals are real, the realist holds that relations are as real as the individual objects they relate.

Peirce’s account of firstness, secondness, and thirdness implies that you cannot have thirdness without secondness or secondness without firstness. You need a first before you can relate it to a second, and you need two before you can introduce a third. However, within experience, it also works the other way around, which must be the case if the three categories are indeed to be found in all phenomena. According to Peirce, you cannot have a first without also having a second, and you cannot have two without also having a third. Even when you conceive of something purely in isolation (i.e., as a first), you are already also conceiving of

something else, namely that which it is not (and which is a second to it) that stands in a particular relation to this first, namely, the relation of negation (which brings in a third).

Peirce devoted much effort to an extensive defense of the categories, showing that more complex relations, such as “Mary gave Jim the book Joe’s father had inherited from the granddaughter of Aunt Helen’s next-door neighbor,” can all be construed from, or reduced to, combinations of firstness, secondness, and thirdness. In short, Peirce denied that there was a category of fourthness, fifthness, etc., a denial that has provoked some thinkers to dedicate their entire careers to proving that there *is* real, irreducible fourthness.

The three categories appear in almost anything Peirce wrote, to the point that he feared that people would think him a triadomaniac. He even wrote a paper about it, “The Author’s Response to the Anticipated Suspicion that he Attaches a Superstitious or Fanciful Importance to the Number Three, and Forces Divisions to a Procrustean Bed of Trichotomy”; but he never published it. Instead, Peirce proclaimed that for most of his life he had tried to disprove the doctrine of the three categories, but that no matter what he did or how he reasoned, the doctrine was always confirmed. One triadic division of Peirce that has gained prominence within contemporary philosophy is that of icon, index and symbol. A second division that did not quite come out as clean is the famous type-token distinction, which comes from the Peircean triad of tone, token and type. But let’s return to Peirce’s classification of the sciences. As far as philosophy goes, we have looked only at phenomenology, which studies phenomena as they appear in their immediacy, that is, in their firstness. The normative sciences, which come next, go a step further. They look at phenomena, not as they appear in their own right, but in their relation to certain ends,

that is, in their secondness. Traditionally, Peirce observed, these ends have been beauty, goodness and truth, and the disciplines that dealt with them are esthetics, ethics and logic.

For Peirce, logic is thus very distinctly a normative science, as it studies the difference between good and bad reasoning (good reasoning being reasoning that leads to truth). Central to this view is the idea that reasoning contains an element of self-control. When we reason, we deliberately submit ourselves to certain rules, which, like moral imperatives, we have the power to break. Instead of finding out how things truly are, we may choose to use our reasoning capacity to find support for what we prefer to believe, or for what we think others want to hear. Thus, the avid smoker may be on the



**“A philosophy is not a thing to be compiled item by item, promiscuously. It should be constructed architectonically.”**

**Charles S. Peirce**

constant lookout for the slightest evidence that smoking isn't all that bad (and cling to it tenaciously), and the medical researcher who works on grants from pharmaceutical companies may become too vested in the interests of the industry that sponsors her research.

Just as morality comes with its maxims (such as "thou shalt not steal") which, when followed, promote right conduct, so too logic comes with certain maxims that are conducive to right reasoning. In logic, such maxims include Ockham's famous Razor ("do not introduce more entities than necessary"), Ernst Mach's principle of economy of thought ("for competing theories, start with the one requiring the least amount of effort for its formulation and verification"), and the one Peirce is most famous for: the *pragmatic maxim*.

Pragmatism has been many things to many people, but for Peirce pragmatism was always strictly a maxim of logic. Philosophers, but others also, all too easily assume that they know the meaning of the concepts they use and much energy is wasted in endless discussions caused by conceptual unclar-

ities. Peirce's pragmatic maxim is a rule designed to clarify our conceptions by directly relating them to experience. In very broad terms, it stipulates that *we should anchor the concepts we use within conceivable practical action*.

In an early article entitled 'How to Make Our Ideas Clear', Peirce distinguished three grades of clearness. At the most basic level, an idea is clear when we recognize it whenever we come across it. For instance, the pawnbroker who can see instantly whether a piece of jewelry is made of real gold, has a clear idea of gold. The second grade of clearness is traditionally obtained by developing abstract criteria that unambiguously determine what is part of the concept and what is not. The scientific definition of gold is an example of this. On this definition, gold is defined as the element that has atomic number 79, meaning that it has exactly 79 protons in its nucleus. This definition uniquely determines gold, as no other element has this atomic number. This second grade of clearness comes close to the traditional notion of clear and distinct ideas that is found in Descartes or Leibniz.

## Charles Sanders Peirce

(1839–1914)

Charles Sanders Peirce (pronounced 'purse') was the second son of the Harvard mathematician and astronomer Benjamin Peirce. Charles Peirce had a difficult personality and powerful enemies. He was a bit of a dandy, and as one of his students later observed, there was an air of irresponsibility about him. He studied at Harvard and in 1861 joined the US Coast Survey, which was then the most prestigious scientific institution in the United States. In 1879, while remaining at the Coast Survey, Peirce joined Johns Hopkins University as a logic instructor. Johns Hopkins University, the first modern-style graduate school in the US, had just opened its doors.

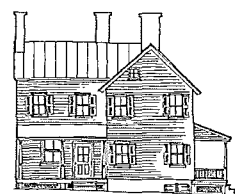
In the early 1880s, respected both as a scientist and as an academic, Peirce was well on his way in what looked like a most brilliant career. It didn't work out like that. On April 26, 1883, only two days after he divorced his first wife, Peirce married his mistress, Juliette Froissy Pourtalais, a woman of uncertain origin with whom he had openly carried on an affair. The circumstances surrounding his marriage quickly gave him the reputation of a deeply immoral man, even though his first wife, Melusina Fay, had left him more than six years before. Peirce lost his position at Johns Hopkins, and his position at the Coast Survey would never be the same. In 1891, after thirty years of service, he was finally forced to resign.

By that time the Peirces had already moved to Milford, Pennsylvania, a small resort-like town a few hours by train from New York City. There they bought a two-thousand acre property with a small farmhouse. Driven by grandiose but unpractical plans, they transformed the farmhouse into a mansion that soon became too expensive for them to maintain. Making most of his money by writing book reviews, Peirce and his wife often went for days without food or firewood, and lived mostly in poverty.

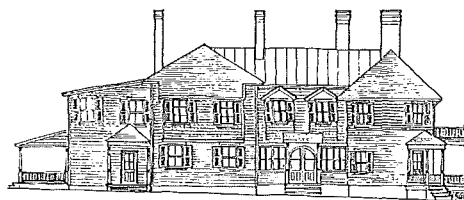
Isolated as he was by the end of his life, Peirce was not forgotten. At Harvard, Josiah Royce was teaching Peirce's philosophy, and after Peirce died Royce was instrumental in

### Peirce's "Arisbe"

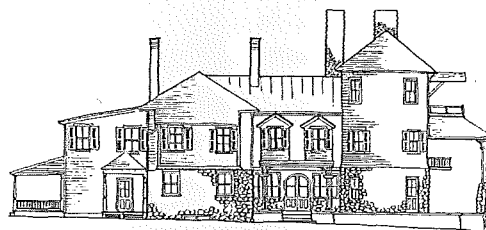
Milford, Pennsylvania



1888



1892



1909



1914

bringing his manuscripts to Harvard. Currently, more than 100,000 manuscript pages (Peirce wrote an estimated two thousand words a day) are held at the Houghton Library at Harvard. In the 1930s a truncated eight-volume edition of Peirce's papers began to appear with Harvard University Press, largely organized around Peirce's division of the sciences. Currently, a more extensive thirty-volume chronological edition, *The Writings of Charles S. Peirce*, is underway at Indiana University.

A problem with definitions like this is that they are made entirely in the abstract. They do not provide any guidelines on how to determine whether an object we actually encounter falls under it; they do not even tell us whether they apply to anything at all. The definition of gold given above only stipulates that if something fits the criteria specified in the definition, then it is (by definition) made of gold.

Peirce sought to overcome this deficiency through his pragmatic maxim: "Consider what effects, that might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object." Application of this maxim gives what Peirce called the third grade of clearness. An important advantage of this third grade of clearness is that it relates meaning directly to the process of inquiry, instead of imposing it upon inquiry in the form of an abstract definition. To further explain the maxim, Peirce applied it to a number of concepts, such as weight, hardness, force, reality, transubstantiation and, a few years later, lithium.

Take lithium. We can define lithium, abstractly, as the element with atomic number 3, as we did earlier with gold, or else we can define it, pragmatically, in terms of its experiential effects. The latter led Peirce to the following definition: "if you search among minerals that are vitreous, translucent, grey or white, very hard, brittle, and insoluble, for one which imparts a crimson tinge to an unluminous flame, this mineral being triturated with lime or witherite rats-bane, and then fused, can be partly dissolved in muriatic acid; and if this solution be evaporated, and the residue be extracted with sulphuric acid, and duly purified, it can be converted by ordinary methods into a chloride, which being obtained in the solid state, fused, and electrolyzed with half a dozen powerful cells, will yield a globule of a pinkish silvery metal that will float on gasoline; and the material of that is a specimen of lithium." What makes this definition pragmatic is that it tells you what the word means by prescribing what you must do to gain a perceptual acquaintance with its object. Hence, far from the passive sense impressions of a Locke or Hume, experience must actively be sought out.

It is, however, Peirce's application of the pragmatic maxim to the concept of truth that has drawn most attention. The result is often called the pragmatic conception of truth. Applying the pragmatic maxim led Peirce to the following conclusion: "The opinion which is fated to be ultimately agreed to by all that who investigate, is what we mean by the truth, and the object represented in this opinion is the real." Individual inquirers may be mistaken or ignorant with respect to particular facts, Peirce argued, but given the pragmatic maxim there can be no errors that are absolutely undetectable, or any ignorance that cannot possibly be remedied. Irremediable ignorance and undetectable errors fail the pragmatic maxim.

Like other theories of truth, such as the correspondence theory of truth, Peirce's pragmatic theory is not without its problems, but it seems to fare better than most. It is, however, important to separate Peirce's pragmatism from the pragmatic views of especially James and Schiller, who both had the tendency to identify the truth of a belief with the good consequences of holding the belief for the believer. When James began to speak of the "will to believe," Peirce

immediately replied by calling for a "will to learn." And although Peirce anticipated the idea of meaning as use (which would later play such an important role in Wittgenstein), he rejected the equivocation of truth with usefulness.

Peirce claimed not only that inquiry will lead in the end to an ultimate opinion, but also that for many of our beliefs it has already done so, even though we cannot say for any specific belief that we have reached it. In this way, Peirce sought to wedge a third alternative between skepticism and dogmatism, which he called fallibilism. The skeptics claim that we can never know anything for sure and that we should thus suspend our judgment. The dogmatists hold that some truths are self-evident and erect upon these their philosophic edifices. Peirce rejected the dogmatist's claim that we know with certainty that some particular beliefs are true, while at the same time dismissing the skeptic's conclusion that it follows from this that all our beliefs must be deemed untrustworthy. Instead, Peirce argued that overall we can trust our ideas, but we should not bet our lives on any single one of them. The skeptic, Peirce objected, makes the basic mistake of concluding from the circumstance that each belief can be doubted that all beliefs can be doubted. These are different things. If at an intersection you may go in each direction, it does not mean that you can go in all directions at once.

Continuing our tour along Peirce's classification of the sciences, we come to the third province of philosophy, namely metaphysics. The aim of metaphysics is to study the most general features of reality and real objects. It is the first and most basic application of logic to the objects encountered in phenomenology. It sets them in relation to each other, so that metaphysics studies the phenomena in their thirdness. Although Peirce confessed that in its present form metaphysics is "a puny, rickety and scrofulous science," he never suggested that we would be better off without it. Find a scientist who boastfully exclaims that he does not need a metaphysics, Peirce maintained, and I will show you a man who holds the crudest and most superficial metaphysical views. Instead of abandoning metaphysics, Peirce advocated that metaphysics be made scientific. Since reasoning in metaphysics is only tangentially checked by experience, proper procedures to avoid bad reasoning are of the utmost importance. Metaphysicians are all too easily swayed by some beautiful system created in the abstract. Peirce's own metaphysics include his "extreme scholastic realism," his evolutionary cosmology, and his rejection of determinism. Peirce also developed a sevenfold classification of metaphysical systems based on the three categories.

Metaphysics is followed by the special sciences (physics, psychology, geography, etc.), which is a good place to end our tour along Peirce's division of the sciences. It was a brief tour and many facets of Peirce's philosophy were not touched upon, including his semiotics, his philosophy of mind and self, his "neglected argument for the reality of God," and his pioneering work in symbolic logic, to name only a few. Peirce was a Renaissance man in philosophy as well.

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