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## Peirce, Pragmatism, and The Right Way of Thinking

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# Peirce, Pragmatism, and The Right Way of Thinking

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## Abstract

This report is a summary of and commentary on (a) the seven lectures that C. S. Peirce presented in 1903 on pragmatism and (b) a commentary by P. A. Turrisi, both of which are included in Pragmatism as a Principle and Method of Right Thinking: The 1903 Harvard Lectures on Pragmatism, edited by Turrisi [13].

Peirce is known as the founder of the philosophy of pragmatism and these lectures, given near the end of his life, represent his mature thoughts on the philosophy. Peirce's decomposition of thinking into abduction, deduction, and induction is among the important points in the lectures.

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## A. Introduction

This Introduction answers the following questions:

1. What are the Peirce lectures?
2. What is pragmatism?
3. What is my response to these lectures?
4. How can we use these lectures for our benefit?
5. What material have I collated?
6. How is the remainder of this report organized?

The first appearance of each Glossary entry in the body of this report—outside of appearances in Tables—is shown underlined.

### A.1 What Are The Peirce Lectures?

In 1903, near the end of his career, C.S. Peirce<sup>2</sup> (1839-1914) presented seven lectures on pragmatism, a philosophy that is customarily attributed to him. In 1987 P. A. Turrisi wrote a commentary on those lectures [13]. This report is a summary and condensation of the lectures and the commentary.

### A.2 What Is Pragmatism?

Pragmatism is a practical approach. The value of an idea is its “cash-value,” a term coined by William James. In philosophical terms, pragmatism states that practicality precedes dogma, even though pragmatism is itself a dogma.<sup>3</sup>

As Peirce puts it, in several places,

...pragmatism is the doctrine that every conception is a conception of conceivable practical effects. (Lecture VII, page 250)<sup>4</sup>

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2. Pronounced “purse.”

3. “dogma 1 a: something held as an established opinion; *esp*: a definite authoritative tenet b: a code of such tenets <pedagogical ~> c: a point of view or tenet put forth as authoritative without adequate grounds 2: a doctrine or body of doctrines concerning faith or morals formally stated and authoritatively proclaimed by a church.” [15]

4. I use the following reference formats in this report:

A reference of the form

(Lecture VII, page 250)

refers to page 250, in Lecture Seven, of Turrisi’s book, in either Peirce’s lecture or Turrisi’s commentary. If this report comments on that material, the additional phrase

(page 57 herein)

indicates the associated page number in this report. A reference of the form

(page 1)

refers to a page in Turrisi’s book that is outside of lecture or commentary (e.g., Turrisi’s Introduction).

[Pragmatism] allows any flight of imagination, provided this imagination ultimately alights upon a possible practical effect. (Lecture VII, page 249 (page 57 herein))

Any hypothesis, therefore, may be admissible, in the absence of any special reasons to the contrary, provided it be capable of experimental verification and only in so far as it is capable of such verification. This is approximately the doctrine of pragmatism. (Lecture VII, page 250 (page 58 herein))

Pragmatism, Peirce wrote, is “nothing else than the logic of abduction” (Lecture VII, footnote 4, page 282 (page 57 herein)). For example, suppose we are in the midst of our work, considering a number of facts but not able to see any general principles. However, it suddenly comes to us that if a certain principle were true, then it would explain these facts. This process is abduction. Mendeleev’s development of the Periodic Table is an example of abduction. He sought the general principle that would explain the facts of inorganic chemistry. He noticed that if atomic weights were the general principle, then it would explain the facts.

Abduction is the process that generates hypotheses and has the following logical form:

“The surprising fact, C, is observed;

“But if A were true, C would be a matter of course.

“Hence, there is reason to suspect that A is true.” (Lecture VII, page 245 (page 56 herein))

Each of us has an “abduction engine” (my phrase) in the “uncontrollable” parts of our minds (i.e., our subconscious) which provides for us a stream of hypotheses about the world around us.

Peirce’s three propositions of pragmatism, from which much of the above material can be derived, are as follows:

1. Everything in our minds is based on something generated by our senses.
2. Perceptual judgments include generality, which enables us to produce general statements based on them.
3. The subconscious uses abduction to produce perceptual judgments; the conscious mind does not criticize those perceptual judgments. (Lecture VII, pages 241-2 (page 54 herein))

Burch [3] explains Peirce’s pragmatism as follows: “When [Peirce] said that the whole meaning of a (clear) conception consists in the entire set of its practical consequences, he had in mind that a meaningful conception must have some experiential ‘cash value,’ capable of being specified as some sort of collection of possible empirical observations under specifiable conditions.”

Atkins notes that pragmatism is intended to enable us to “see what difference the truth of certain concepts would make to our lives” [1].

Webster’s Dictionary describes pragmatism as the proposition that “the meaning of conceptions is to be sought in their practical bearings, that the function of thought is to guide action, and that truth is preeminently to be tested by the practical consequences of belief” [15].

Thayer explains that “Because the emphasis is upon method, Peirce often remarked<sup>5</sup> that pragmatism is not a philosophy, a metaphysic, or a theory of truth; it is not a solution or answer to anything but a technique to help us find solutions to problems of a philosophical or scientific nature” ([9], “Pragmatic Theory of Truth” entry).

I save for last in this section what I believe to be the most abstruse of Peirce’s definitions of pragmatism. I believe it is also the most famous. It is often referred to as the Maxim (i.e., principle) of Pragmatism:

Consider what effects that might conceivably have practical bearings we conceive the object of our conception to have; then, our conception of those effects is the whole of our conception of the object. (Lecture VI, page 231 (page 50 herein))<sup>6</sup>

I translate this to mean that pragmatism is the proposition that the value and meaning of any concept is the set of its possible effects. That is, meaning is consequence (Lecture I, page 110 (page 19 herein)). The deciphering of the above definition is easier, I believe, with an example “concept” in mind. I pass along Atkin’s example of “vinegar” [1]. Vinegar is a concept that concerns a substance. We each use our concept of vinegar to explain and predict experience with the substance we call vinegar. Using a concept in this way is to be thinking pragmatically.

If that is the case, what does it mean to think un-pragmatically? To continue with the vinegar example, to think un-pragmatically is to hold to a concept that is not supported by experience. For example, suppose that I hold to the concept that vinegar tastes sweet. I do not allow the fact that vinegar does not taste sweet to change the concept I hold but rather I use it to call into question the veracity of the label on the bottle or my taste buds or my concept of “sweet.” That is, to think un-pragmatically is to force the square peg of authoritative tenets into the round hole of experience. But persisting in such behavior is not so much a philosophy as it is a recipe for mental illness! Does pragmatism then reduce to little more than the admonition to be mentally fit? In addition, the philosophy of pragmatism presents a conundrum: if all philosophy is dogmatic, how do we classify pragmatism, the philosophy that we should not be dogmatic?<sup>7</sup>

As people in the midst of everyday life we address such problems by waving them aside as nonsense and we get on with our lives.

Perhaps, then, pragmatism is the admission by philosophers that the way we handle everyday life (i.e., pragmatically) is an acceptable position. Like the man who learned to his surprise that he had been speaking prose all of his life, perhaps pragmatism is the philosophy that we are all philosophers and pretty good ones at that. Pragmatism just hopes to help us see how we do it so we can get better at it.

With all due respect, I believe that the nuts and bolts of pragmatism is the admonition to cultivate the use of abduction—an unconscious process—and the conscious application of deduction and induction. I believe that Peirce would agree that this is the “right way of

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5. I did not notice this remark in these lectures.

6. This passage is from Peirce’s paper “How to Make our Ideas Clear” (1878).

7. If existentialism is the philosophy that the problem is philosophy itself, then perhaps pragmatism and existentialism are bedfellows of some sort.

thinking.” It is pragmatism’s cash-value.

## A.3 What Is My Response To The Lectures?

### A.3.1 What I Wish

I wish that Peirce had begun with Lecture Seven. As the reader will note, all of the lecture passages quoted in Section A.2 above, except for the Maxim of Pragmatism, come from Lecture Seven. That lecture is the one that I found most focused on pragmatism and what it means. What would the lecture series have been if Peirce had started from there?

I wish someone had hired an editor who could have sent back to Peirce for re-writing the murky, extraneous parts of the lectures, such as any time Peirce talks about “infinity,” any time Peirce presents geometric proofs, any time Peirce tries to distinguish “genuine” from “degenerate,” any time Peirce defines “goodness,” and almost all of Peirce’s architectonic<sup>8</sup> discussions. At times I find Peirce sparkling in his clarity, the words fairly crackling on the page. But at other times I find him far afield, pursuing a murky path, trying to support extraneous claims and answer extraneous objections. I wish he had had an editor.<sup>9</sup>

I wish that Peirce had spoken to us and not to his immediate audience. I believe that the lectures would have then provided more of the material that I find wanting in their current form.

I wish that Peirce had noted that pragmatism is at the “bottom of things,” to use one of Peirce’s phrases, and thus there can be no supporting proof.<sup>10</sup> Instead, Peirce could have described what pragmatism is not and then have proceeded to show why pragmatism is superior.

### A.3.2 Where I Think Peirce Was Right

I think Peirce was right about a central point of our existence, about what he calls in one place the “instinctive mind”:

But the sum of it all is that our logically controlled thoughts compose a small part of the mind, the mere blossom of a vast complexus which we may call the instinctive mind, in which this man will not say that he has faith because that implies the conceivability of distrust, but upon which he builds as the very fact to which it is the whole business of his logic to be true. (Lecture VII, page 256 ((page 59 herein))

In addition, I think Peirce rightly attributed Thirdness—see Section A.5.1 on page 13 for a

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8. “of, relating to, or according with the principles of architecture” [15].

9. As, no doubt, my readers wish as well!

10. Living in a practical age, it is facile to project practicality on to other ages. But there are arguments that ours is an unusual age: Nowadays we take the practical attitude for granted. We seem to think that there is in most people an inborn inclination to make use of every device and circumstance to facilitate their work and further their ends. Yet it needs but a moment’s reflection to realize that, so far from being natural, the practical sense has been throughout history a rare phenomenon. Its prevalence is a peculiarity of the Occident and here, too, it has asserted itself only during the last two hundred years. ([10], page 48)

description of “Thirdness”—to the subconscious. He rightly compared it with abduction. And he rightly acknowledged that we do not know how the subconscious mind generates instances of Thirdness.

However, I think Peirce missed the importance of context. “Thirdness,” he says, “pours in upon us through every avenue of sense” (Lecture VI, page 224 (page 49 herein)), but it comes complete within a context that includes goals and actions to accomplish those goals. Peirce is not to be blamed—such luminaries in Artificial Intelligence as Minsky, Schank, Simon, and Feigenbaum, also missed this point. When we see a “table,” that insight comes packaged with it all of human endeavors, as Dreyfus points out:

A normal person experiences the objects of the world as already interrelated and full of meaning. There is no justification for the assumption that we first experience isolated facts, or snapshots of facts, or momentary views of snapshots of isolated facts, and then give them significance. The analytical superfluosity of such a process is what contemporary philosophers such as Heidegger and Wittgenstein are trying to point out.” ([6], pages 269-70)

Note that Dreyfus is talking about conscious experience.

As Wilson observes, “Consider that at any given moment [i.e., each second], our five senses are taking in more than 11,000,000 pieces of information...The most liberal estimate is that people can process consciously about 40 pieces of information per second” ([16], page 24). Apparently there is considerable subconscious machinery involved, able to manage six orders of magnitude more information than our conscious minds can manage. Wilson continues

According to the modern perspective [i.e., that of Wilson and others], Freud’s view of the unconscious [what I call the “subconscious” in this report] was far too limited. When he said (following Gustav Fechner, an early experimental psychologist)<sup>11</sup> that consciousness is the tip of the mental iceberg, he was short of the mark by quite a bit—it may be more the size of a snowball on top of that iceberg. ([16], page 6)

I think Peirce was right in many other places, such as when he takes other philosophers to task, but these are minor points compared to the major one above.

### A.3.3 Where I Think Peirce Was Wrong

I think Peirce was wrong to pursue what he called a “proof” of pragmatism. Proofs apply only to hypotheses; Peirce did not provide us with a hypothesis. Peirce wanted to establish pragmatism as something more than a definition. But pragmatism *is* nothing more than a definition. As a consequence Peirce wasted time establishing his architectonic view of science and confusing us with inadequate mathematics. I think Peirce would have been better served to have confined his presentation to arguments in favor of pragmatism.

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11. Note that these parenthesized comments are part of the original passage, whereas the bracketed comments have been inserted as part of this report.

I think Peirce was wrong to assume that by giving abduction an inferential form that his reader would be convinced that abduction was an element of logic and that therefore we would be convinced of its truth. While logic may be a good helper, it is a poor guide, as the Columbia Encyclopedia unwittingly points out in its entry on Kant:

Kant demonstrated with unimpeachable logic that space and time are infinite and that they are finite; that matter is infinitely divisible and that it is not infinitely divisible; that the will is completely determined and that it is completely free; and that a necessary being (God) exists and that He does not exist. ([5], "Kant" entry)

I think Peirce was wrong in not identifying what pragmatism is not. This is one way to clarify a concept. If a concept applies to everything, then the concept is useless: it does not distinguish anything. For example, if "blix" is true of everything, then the use of the word does not help us: we are none the wiser.<sup>12</sup> So what is pragmatism not? Is it formalism? Thomism? Cartesianism?

I think Peirce was wrong about Firstness and Secondness being distinct from Thirdness—again, see Section A.5.1 on page 13 for a description of "Firstness," "Secondness," and "Thirdness." They may be distinct. After all, our five senses *do* receive raw data. But that is not the point. I think that except for rare instances we—our consciousness—we experience Thirdness only. In addition, I think we have no desire to experience anything but Thirdness. Secondness is immediately translated into Thirdness. And in those rare instances when we are confronted with Firstness it is so terrifying that in the instant it takes us to translate it into some semblance of Secondness and then on into something that will do for the nonce as Thirdness we are already in a state of panic.

## A.4 How Can We Use The Lectures For Our Benefit?

In practical terms, we can use Peirce's lectures to build a model of how we make decisions. Peirce presents three logical forms: abduction, deduction, and induction. Abduction generates hypotheses; deduction makes predictions based on those hypotheses; induction winnows the hypotheses by testing the predictions generated by deduction. This process "approximates" experience. It is, at the same time, an "explanation" of experience. It is close to the way that we get an increasingly better handle on life, as Turrisi explains (Lecture VII, page 97 (page 54 herein)).

Pragmatism is the proposal that the value and meaning of any concept is the set of its possible effects (Lecture VI, page 231 (page 50 herein)). If a concept has no possible effects, then it has no value and no meaning. If two concepts have the same set of possible effects, then the two concepts are the same. Pragmatism is utilitarianism with long-range goals (Lecture VI, page 224 (page 49 herein)).

A "perceptual judgment" is the recognition of a type in some perceptual field. For example, when we recognize a table, we have made a perceptual judgment. In this example, the perceptual field is our visual field and a table is a type of object. Perceptual judgments are

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12. There is a matching problem with "unique objects," objects that share no properties with any other object, that Leibnitz claimed existed [14]. But how could you describe such an object?

made by the subconscious mind. The process whereby perceptual judgments are made is abduction. We may understand the logical form of abduction but we do not understand how the process is performed. Our own minds provide us with a working model from which we can learn. As we pragmatically apply Peirce's three logical forms to the perceptual judgments that our own subconscious serves up to us, we will be better able to refine our conscious minds and make better decisions.

## A.5 What Material Have I Collated?

Peirce's phenomenological categories and his architectonic view of science are important to understand but are presented in a scattered fashion in the lectures. I have collated this material here for ease of comparison and reference.

### A.5.1 What Are Peirce's Three Phenomenological Categories?

Peirce argued that there were three phenomenological categories, which he called "Firstness," "Secondness," and "Thirdness."<sup>13</sup> A Firstness experience involves a perception without a perceptual judgment, like seeing the color red. A Secondness experience is a reaction. There are always two parties to a Second, hence the name.<sup>14</sup> A Thirdness experience involves an object, a symbol, and someone to connect the two. There are always three parties to a Thirdness, hence the name. Peirce describes these categories in various ways in various places in these lectures. For ease of understanding, I have collated some of these varieties and they are shown in Table 1. (Peirce sometimes referred to the categories as "First," "Second" and "Third" (Lecture III, page 167 (page 31 herein)) as opposed to "Firstness," "Secondness," and "Thirdness." In this report I use the latter set only.)

**Table 1 Peirce's Three Phenomenological Categories**

Firstness	Secondness	Thirdness	Reference
Sensation	Perception	Thought	Lecture III, page 49 (page 29 herein)
Feeling <sup>a</sup>	Reaction	Thought	Lecture V, page 68 (page 41 herein)
Esthetics	Ethics	Logic	
Seeing the color red (Lecture III, page 188 (page 34 herein))	Surprise <sup>b</sup>	A gives B to C <sup>c</sup> (Lecture III, page 186 (page 34 herein)). This describes the concept of "giving."	
Beauty	Right	Truth	Lecture V, page 208 (page 43 herein)
Phenomenology	Normative Sciences	Metaphysics	

13. As Burch noted, trichotomies appear with "overwhelming obtrusiveness" [3] in Peirce's philosophy.

14. Murphey writes that "Peirce derived a threefold ontological classification of all there is into matter (the object of cosmology), mind (the object of psychology), and God (the object of theology). Peirce referred to these three categories as the It (the sense world), the Thou (the mental world), and the I (the abstract world), respectively; and it was from these pronouns that he subsequently derived the names Firstness, Secondness, and Thirdness, by which he usually called his categories" ([11], page 71).

**Table 1 Peirce’s Three Phenomenological Categories**

Firstness	Secondness	Thirdness	Reference
Inference	Otherness	Character	Lecture VII, page 248 (page 57 herein)
Quality	Relation (also “Struggle” (Lecture II, page 141 (page 25 herein)))	Representation	Lecture V, footnote 3, page 276 (page 45 herein)
Abduction	Induction	Deduction	

- a. The trio in this row are what Peirce calls the “psychological aspect” (Lecture V, page 68 (page 41 herein)) of the three categories.
- b. The following are two examples that Peirce gives of “surprise:”  
 “Yet if while you are walking in the street reflecting upon how everything is the pure distillate of Reason a man carrying a heavy pole suddenly pokes you in the small of back...” (Lecture III, page 188 (page 34 herein)).  
 “A ship is sailing along in a smooth sea, the navigator having no other expectation than that of the usual monotonous voyage, when suddenly she strikes upon a rock” (Lecture II, page 144 (page 25 herein)).
- c. The example given here is of the act of “giving”.

### A.5.2 What Is Peirce’s Architectonic View Of Science?

Peirce believed the sciences could be organized hierarchically, a view he shared with Kant. For example, it is customary to consider that biology is based on chemistry which, in turn, is based on physics. Peirce considered mathematics to be the foundation; philosophy is built on mathematics, and the other sciences are built on philosophy. Within philosophy, phenomenology is at the base, with the “normative sciences” (namely esthetics, ethics, and logic) successively built up from there. Pragmatism is an element of logic, so in order to understand it, we need to understand its foundation, at least down to and including phenomenology. Peirce’s structure of the sciences is shown in Table 2 below.

**Table 2 Peirce’s Architectonic Structure**

		Pursuit	Category
Special sciences <sup>a</sup>		Facts	
Philosophy	Metaphysics	Reality	Thirdness
	Normative sciences (see also Lecture I, page 34 (page 19 herein))	Logic <sup>b</sup>	Secondness
		Ethics <sup>c</sup>	
		Esthetics <sup>d</sup>	
Phenomenology	Universal phenomena	Firstness	
Mathematics			

- a. e.g., psychology, anthropology, linguistics, history.
- b. “...those things whose ends are to represent something” (Lecture V, page 71 (page 41 herein)).
- c. “...those things whose ends lie in action” (Lecture V, page 71 (page 41 herein)).
- d. “...those things whose ends are to embody qualities of feeling” (Lecture V, page 71 (page 41 herein)), “...what it is that we are prepared to admire” (Lecture One, page 118 (page 21 herein)).

## **A.6 How Is The Remainder Of This Report Organized?**

The remainder of this report consists of my notes on Turrisi's book. For ease of reference my notes are shown page-for-page with the text. So that my notes do not break up paragraphs, I define the beginning of a page to be the beginning of its first full paragraph. Headings in the text are included herein as separate paragraphs in bold text. The page numbers are shown in parentheses at the beginning of my notes for the page.

As far as possible I use my own words, not Peirce's and not Turrisi's. The advantage of this approach is that I provide digested material; the disadvantage is that the material is colored and limited by my understanding. I believe that the disadvantage is mitigated by keeping my notes aligned, by pages, with the original so that comparison is straightforward: the reader can see the original and easily compare it to my notes. Occasionally I quote Turrisi or Peirce, in which case I use quotation marks. I include a summary of footnotes, when appropriate, in the place where they appear (e.g., Lecture II, page 261 (page 25 herein)). I begin each lecture with my own summary.

In my summary of Turrisi's commentary I use the third person but in my summary of Peirce's lectures I do not use a person—I write as though I were Peirce—except for pages 205-8 (page 42 herein) in which Peirce describes his method of philosophizing. In that particular passage the explicit use of the first person singular would have jarred more, I believe, than writing in the third person.

I confine my explicit comments and questions to indented paragraphs, formatted the way this paragraph is formatted.

A number of topics come up a number of times. I have not tried to collect these instances and thereby present the material in the lecture by topic except for the two topics in Section A.5. Rather I review the lectures page-by-page in their original sequence.

## B. Turrisi's Introduction

This Introduction provides the context within which to understand the lectures.

Pragmatism was developed by Peirce in the Metaphysical Club in Cambridge, Massachusetts in the 1870s. James in his 1898 Berkeley lecture to the Philosophical Union, [entitled] "Philosophical Conceptions and Practical Effects," articulated pragmatism so clearly that the lecture seems to have been the defining moment for the concept. However, Peirce did not agree with James' 1898 definition.<sup>15</sup> That little bit of history sets the stage.

In 1903 Peirce was destitute. He had applied for a grant and was rejected. Without any means of support, Peirce informed James, then a professor of psychology at Harvard and longtime associate of Peirce, that he, Peirce, would work on what he had proposed until his food ran out, then end his life. Alarmed, James arranged for Peirce to give a lecture series, for which we could be paid, on any topic he chose.<sup>16</sup> Peirce chose pragmatism.

Peirce considered pragmatism to be an element of logic: Peirce espoused "logical realism" (page 17). James, on the other hand, considered pragmatism to be an element of psychology: James espoused "psychological nominalism" (ibid.).

Peirce was direct about this difference, trouncing nominalism several times in the lectures (see the "Nominalism" entry in the Glossary (page 65)). Those attending the lectures must have known that Peirce was talking about James' position, even though, from my reading of the lectures, Peirce nowhere attributes James' position to James himself.

James, on the other hand, sublimated the friction. When James spoke to Peirce, he claimed that he, James, was logically and mathematically unequipped to understand Peirce's lectures. But when James spoke to others, he made ad hominem attacks on Peirce, complaining about Peirce's way of life and habits. James did not attend all of the lectures, and he blocked publication of the lectures during his lifetime.<sup>17</sup>

Tellingly, the title that James provided for the series, without first consulting with Peirce, was "Pragmatism as a Principle and Method of Right Thinking," but the title that Peirce chose, as shown by his manuscripts, was simply "Lectures on Pragmatism" (page 9).

The significance of the Peirce-James divide is that the lectures can be seen as Peirce's opening argument in what Peirce hoped would be a debate with James.

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15. "Peirce's pragmatism became widely known through [William] James' lectures and writings, but Peirce was dissatisfied with James's version of pragmatism, and renamed his own form of it 'pragmaticism,' which he considered to be 'ugly enough to keep it safe from kidnapers'" ([4], "Peirce, Charles Sanders" entry).

16. James once wrote that Peirce was "a man of genius in the purest sense of the word" (page 1).

17. H.S. Thayer notes that one could maintain that James was developing a different philosophy than Peirce and that James' "habitual overgenerosity [sic] led him to call what he was doing 'pragmatism' and to cite Peirce as the 'inventor'" ([9], "Pragmatic Theory of Truth" entry).

# 1 Lecture One: "Introduction"

In this lecture, Lecture One, Peirce describes the goal of the lecture series, namely to provide formal support (as opposed to empirical support, I believe) for pragmatism. Yes, pragmatism is certainly valuable, but this does not mean that it is "true." Peirce believed in an architectonic arrangement of science, namely, mathematics supports phenomenology, and phenomenology supports esthetics, and esthetics supports ethics, and ethics supports logic, and so on (see Table 2 on page 14).

Logic is where pragmatism fits. This hierarchical notion is similar to the notion that physics supports chemistry, and chemistry supports biology.

Peirce intended to establish pragmatism by first establishing phenomenology, then building on that to establish esthetics, and then building on that to establish ethics, and finally building on that to establish logic.

Peirce does not answer or raise the question of why he descends to a level so far removed from logic. If logic, where pragmatism sits, rests on ethics, then why can he not develop formal support for pragmatism by principles of ethics alone?

## 1.1 Turrisi: Commentary On Lecture One

(23) Perhaps Williams James was the one who described these lectures as philosophy as it pertains to the "practical bearing upon life." At any rate, Peirce described these lectures as a "philosophical system" that applied to science, philosophy, and the "conduct of life." Peirce intended in these lectures to provide a proof of pragmatism, preceded by a definition.

I think what Peirce means by "proof" is simply a "convincing argument." As we will see below, Peirce wanted to convince us that pragmatism was a principle of logic. The significance of this is that we can then describe pragmatism as at least one of the possible inference forms, namely what Peirce calls abduction. We are then in a position to understand better pragmatism and apply it.

### (24) Pragmatism as a Logical Maxim

Peirce in 1878 presented 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 those effects is the whole of our conception of the object" (Lecture VI, page 231 (page 50 herein)).

That is, the meaning of an idea is the effect it has on the set of things that are of interest. Meaning is thus subjective, because what is of "interest" depends upon the person.

But, contrarily, what else could an idea mean? Is there an idea that has no effect?

Peirce wanted to reclaim the definition of the term.

In 1898, five years before Peirce presented these lectures, William James gave a lecture, "Philosophical Conceptions and Practical Results," that popularized pragmatism. Peirce disagreed with James' definition. Peirce's lectures can be seen as a response to James' definition.

(25) According to Turrisi, Peirce believed that he invented pragmatism. James thought that activity is how we evaluate an idea: we see how it works when we apply it. Pragmatism—an idea itself—is valuable to the extent that it helps us get along in life. Peirce, on the other hand, thought that pragmatism helps us with logic, with thinking correctly. In fact, he went so far as to argue that you have to use pragmatism to think anything.

If pragmatism does not just divide "good" thinking from "bad" but is essential to any kind of thinking, then one wonders what is the basis for Peirce making any argument at all. How would those who think badly be able to comprehend his argument, let alone be convinced and change their minds?

Peirce wanted to establish the proof of pragmatism as a principle of logic.

(26) Turrisi states that Peirce wanted to base his proof on the "ladder" or hierarchy of the sciences.

At the foundation is mathematics. Philosophy builds on mathematics. The physical sciences build on philosophy, and so on.

This hierarchy is an "architectonic" view.

(27) Solutions in one science should be derived from building on knowledge developed by sciences below it in the hierarchy. Within philosophy, logic is based on ethics, and logic, in turn, is based on esthetics.

(28) Turrisi says that this set of lectures provides Peirce's most detailed description of the hierarchy.

### **Pragmatism's Efficacy versus Pragmatism's Truth: The Need for a Proof**

Pragmatism "works," as evidenced by people who use it.

How do we know? That is, what does it mean to claim that "pragmatism works"? What would it mean for someone to think un-pragmatically? Would this be herd-behavior? superstition? mental illness?

(29) Peirce argued that just because something has practical value does not imply that it is "true," hence the need for a proof of pragmatism. Also, like other scientific theories, pragmatism is simple and may need adjustment over time to fit in practice. Peirce thinks that we humans want to be consistent, so we want to act according to what we reason out.

(30) We humans want to reduce what Peirce called "doubt."

(31) Peirce placed pragmatism within logic. He thought that humans were disposed to think pragmatically. Perhaps this was no more than the result of evolution, which could include

logical forces.

### **The Role of Pragmatism in Logic and the Role of Logic in the Architectonic of Science**

(32) Is “doubt” and its motivation logical? Turrise explains that Peirce considered logic to be a way to determine how to reason.

(33) If pragmatism is part of logic, then it should help further the goal of logic. A proof should rely upon the sciences below logic in the hierarchy.

(34) Logic corresponds to thought; ethics corresponds to reactions; and esthetics corresponds to feeling. These are the three “normative” sciences: they describe what ought to be. These rest on phenomenology, the intent of which is to consider things “as they are.”

Of course we are unable to determine if we ever see things as they are. “Out of the great cake of life, each species cuts a slice,” as Uexkull puts it ([2], page 227), meaning that each species has sensors for only a limited range of input. Dogs, for example, hear more frequencies than humans, but humans see more frequencies—color vs. only black & white—than dogs. What we do know is that if we are able to survive, our perception has some correspondence to reality.

Meanwhile, we “see” things (i.e., we perceive meaning) only within a context. It is the context that provides the meaning. In the split-second occasions when we are without context—when we are awoken from a deep sleep, sometimes—we work frantically to establish context.

(35) Peirce uses mathematical examples in these lectures because of his belief in the architectonic nature of science.

(36) Peirce considered these lectures to present a complete arrangement in support of pragmatism and that he was the only one to have provided such a complete arrangement.

## **1.2 Peirce: Lecture One**

(109) Pragmatism is a fundamental principle of logic. That is, it is a rule of how we should think. It is valuable in practical terms, but there are objections to it. There are many definitions of pragmatism, all moderately acceptable, but none of them describe pragmatism with a satisfying precision.

(110) The initial definition of pragmatism for these lectures is the one from January 1878 (Lecture I, page 24 (page 17 herein)). Many have people have built on this definition, all without acknowledging the author (Peirce). Perhaps those other writers have thought the author too pedestrian.

(111) Imagine people who are “infinitely” rich, gambling. Whether each person continues to play depends upon whether or not they are winning. But no matter how many times they win, the winners are no richer than before because they were already “infinitely” rich.

I think Peirce is confused about the meaning of “infinitely,” hence the value of the scenario is suspect.

(112) So probabilities involve “paradoxes” and “puzzles.” An insurance company uses probabilities so that the company’s income will be greater than its claims.

(113) Probabilities, at least for insurance companies, reflect what happens in the world and is not simply a mental construct.

(114) Probabilities are intended to reflect ratios involving events for an unbounded number of events. Imagine tossing a coin—we win if it is heads; we lose if it is tails—an indefinite number of times. In this case it is impossible to determine whether we end up winning or losing.

The indeterminate nature of winning/losing in this example is not a problem with probabilities. It is part of the construction of the game. The equivalent is the number of zeros in a random and unbounded bit string. If the string is random, then the number of zeros will tend to  $1/2$  the number of bits but it will vary above and below that in order to accommodate the randomness of the string.

(115) A probability of 1 does not mean certainty, oddly enough.

Peirce’s example is contrived because it depends upon the use of infinity as a number, this time in a ratio, as though a constant divided by infinity were defined. Granted, the ratio  $A/B$  goes to zero asymptotically if  $A$  is a constant and  $B$  increases without bound, but this is a different matter than saying that  $A/B = 0$  when  $B$  is infinity.

There is an association between “successful” and “efficient” people and those who use pragmatism. Pragmatism solves many questions. But this does not mean that pragmatism is “true”: it might need embellishment.

Peirce provides no support for either claim, nor does he tell us what “true” means.

(116) The argument in the “original paper” [12] is that the proof of pragmatism rests on “belief,” which is a willingness to put into action one’s cognitive conclusions. Perhaps belief is a manifestation of people’s desire to act “consistently.” Can we attribute this desire for consistency to evolution? Can we understand a concept independently of our belief in it (i.e., our willingness to adapt our behavior based on the concept)?

What would Peirce think about societies that practice sympathetic magic such as voodoo? Are these people thinking pragmatically? The magic certainly works, so I think we would have to conclude that the people are thinking pragmatically. We do not believe in such magic in our society, and it does not work here. Does that mean that two people can both think pragmatically and yet arrive at different and legitimate conclusions? What, then, is “truth”?

(117) An “assertion” is different than “laying a wager.” Can belief have any effect besides upon behavior? What difference in behavior is there if we do or do not believe that we can state the precise value of an irrational number, say? One of the values of pragmatism is that it can accept or discard theories based on their practical effects.

(118) Because pragmatism is valuable, we should determine if it will always lead us aright. Logic describes what we should think and is dependent upon ethics, which describes what we should do and is dependent upon esthetics, which describes what we should admire.

I think that what Peirce wants is the assurance that we can follow pragmatism based on the nature of pragmatism itself, instead of having to build confidence—always tenuous—based on the results of using pragmatism in a necessarily limited number of instances.

But this argument presumes that there is a way to establish non-tenuous conclusions. If that were the case, there would be no need of a “proof” of pragmatism, because we would use that other way in our lives and dispense with pragmatism altogether.

(119) Esthetics is dependent upon phenomenology, which describes what is. The goal of phenomenology is to describe the “categories” or “fundamental modes” by which we describe a phenomenon. Hegel thought there were two types of categories, namely (1) Universal and (2) a sequence of categories that are a function of evolutionary stages.

(120) There are three categories in Hegel’s Universal type. Hegel did not call them “categories” but rather called them, accurately, “stages of thinking.” Because esthetics, ethics, and logic all depend upon phenomenology, phenomenology should be studied prior to the others.

I believe that Hegel’s “stages of thinking” to which Peirce refers are his dialectic: thesis, antithesis, and synthesis.

(121) Phenomenology is based on mathematics. Mathematics is concerned with how things could be, not how they are. Hegel’s phenomenology depended upon an immature mathematics and as a consequence is a “pitiful clubfooted affair.”

## 2 Lecture Two: “Phenomenology or the Doctrine of Categories”

In this lecture, Lecture Two, Peirce argues (1) that mathematics is the basis of logic (or at least phenomenology) and (2) that there are three categories of phenomena.

Mathematics consists of hypotheses that have at least one, two, or three terms. Phenomenology, in Peirce’s view, also has three categories—Firstness, Secondness, and Thirdness—which correspond to mathematical expressions of one, two, and three terms, respectively.

Also in this lecture, Peirce presents his method of philosophizing as an example of pragmatism in action, so to speak. His method is explicit, methodical, and intellectual. It is as slow as the growth of a seedling and requires as much care.

### 2.1 Turrisi: Commentary On Lecture Two

(37) The focus of this lecture is phenomenology. This is equated with the “categories,” i.e., the mental bins that we have and by which we mentally organize our world. Peirce felt he did not have enough time in the lectures to present the material that he considered that his audience required. A book is not so constrained, so Turrisi presents in this lecture several draft versions of the lecture to give the reader some of the added material that Peirce wanted to include.

(38) Peirce was forced to trim his material.

#### A Method of Work and its Application

There are five drafts extant of parts of Lecture Two. Turrisi includes this material in the lecture. In her commentary Turrisi also includes manuscripts on Peirce’s approach to developing philosophy, which is an example of pragmatism in action, so to speak. Turrisi considers Peirce’s early drafts to show what Peirce thought. Later drafts are an adaptation of that material for a particular audience, hence the value of the earlier drafts.

(39) Peirce was frustrated by the constraints of the lectures. Peirce felt he could not do his topic justice and yet provide enough foundation for his audience to understand him. Peirce wanted to explain and justify his architectonic view of the sciences.

Why did Peirce not trim his topic? Alternatively he could have spoken in each lecture a subset of what he had written for that lecture. Why did Peirce not use the lectures as a platform to speak to the world?

(40) Like Descartes and Leibniz, Peirce described his method for developing philosophy. His method required such detail that he felt he could do little more in the lectures than give conclusions.

(41-45) Turrisi provides Peirce’s description of his philosophical method, from MS 311 and MS 312, which was explicit and intended to be exhaustive. His method was iterative, examining a question from as many sides as he deemed reasonable, periodically starting anew and comparing those results with previous results. Peirce compares his method of addressing a philosophical question to the process of a seedling growing into a tree: both require nurturing

and both proceeding slowly (see also Lecture V, pages 205-7 (page 42 herein)).

(46) Turrisi notes that Peirce's approach can be a description of how to think pragmatically. Such thought is methodical above all else.

How else besides the method Peirce describes would one justifiably consider philosophical questions? Peirce's approach would have more significance if we could see it within the context of how such questions could be addressed and have in fact been addressed. The next step would be to evaluate the output given a particular method. Only then would we be in a position to consider the relative merit of the methods. It is the relative merits—i.e., we are pragmatists—that is of value to us.

Meanwhile, whether or not Peirce himself actually followed his method is irrelevant because Peirce is describing what he considers to be a pragmatic way to think. However, Peirce's method appears to be intellectual and unemotional. He seems to discount intuition, for example, though he elsewhere mentions the "flash" with which subconscious abduction arrives in the conscious mind (Lecture VII, page 242 (page 55 herein)).

### Some Pedagogical Considerations

Peirce considered that his audience needed preliminary instruction to understand his message. Turrisi views the early drafts of Peirce's lectures to be independent of his audience, the later drafts adapted to this particular audience.

(47) Peirce had a lifelong interest in pedagogy. He believed that we understand only what we derive ourselves [as opposed to what we hear in a lecture?<sup>18</sup>] and that thought requires method and attention to detail.

## 2.2 Peirce: Lecture Two

Note: This lecture contains two drafts of "Part A: Mathematics as a Basis of Logic" and three drafts of "Part B: On Phenomenology."

### Part A: Mathematics as a Basis of Logic (Draft One)

(123) The first job of education is thoroughness. The second job is logic (i.e., how to think). The significantly-less-important third job is the detail of various topics such as mathematics, history, and geography.<sup>19</sup>

(124) Mathematics studies hypotheses. Hypotheses can be categorized based on the number of terms they use. The simplest hypotheses consist of a single term. Such hypotheses provide no information. The next simplest hypotheses consist of two terms. These hypotheses bifurcate

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18. or read in a report like this?

19. Peirce considered that 50% of the lessons should be "teaching some small branch, no matter which, thoroughly,—say perhaps to boiling an egg." The other 50% should be distributed as follows: 36% on logic; 3% on mathematics; 2% on ethics; and 1% on each of (a) metaphysics, (b) psychology, (c) "the living and dead languages," (d) history, geography, and "statistics ancient and modern," (e) "dynamics and physics," (f) chemistry, (g) biology, (h) astronomy, geology, and physical geography [it is not clear what the previous "geography" in the list is], (i) law, divinity, medicine and "other applied sciences."

the world. Boolean algebra fits here (because all Boolean variables are constrained to hold one of only two values).

(125) Two-term hypotheses constitute "Dichotomic Mathematics," which includes linear algebra.

(126-7) The "logic of relatives" undermines Kant's philosophy.

If there are three terms, then we have "trichotomic mathematics." Three terms can be arranged in only one way, as points of a triangle, so that each relates to the other two.

(128) Similarly, four objects can be arranged in only one way. This is self-evident, like all mathematics.

It is not clear what Peirce means about being "arranged" in "one way." Could he be arguing something as trivial as that any graph can be fully connected?

(129) An arrangement is a relation. A "relation" itself can be thought of as an object in its own right, though an unusual one. The objects and their arrangements can be likened to atoms and chemical bonds, respectively.

#### **Part A: Mathematics as a Basis of Logic (Draft Two)**

(130) Mathematics is the study of abstract hypotheses. The field depends on diagrams or pictures of some kind.

(131) Mathematics enables generalizations that apply in all cases, unlike natural science. But no one has ever described the steps of how to think mathematically.

(132) Mathematical thinking usually includes a particular type of logical step. "Hard" is an example of a "concrete" type of description, and "hardness" is an example of an "abstract" type of description.

(133-4) The logical step involves moving from the concrete to the abstract. Or, more simply, presuming that there is an explanation, it involves detecting something more fundamental.

(135) This logical step is demonstrated in geometry. Let "filament" be the part of a line occupied by a particle at any instant. Filament is abstract and the particle is concrete.

A part of a line is still a line. And lines consist of "points," not "particles." This is a confusing demonstration.

(136) A "film" is an abstraction of a filament, and a "solid body" is an abstraction of a film, and so on. Another abstraction is a "collection" and its constituting members.

(137) The branches of mathematics derive from the different number of terms in their hypotheses. Hypotheses with a single term are the simplest but because these hypotheses apply to everything (or nothing), they provide no description. Hypotheses with two terms dichotomize the universe.

(138) Hypotheses with three terms describe triadic relations.

(139) **Part B: On Phenomenology (Draft One)**

We would like to provide a convincing description of what it means to say that something is in our minds. Peirce said he had been at work on this problem for forty years. The first thing we notice, he says, is “presentness.”

Unfortunately Peirce leaves “presentness” undefined and unexplained.

(140) That is, what is before our minds has no relation to anything else.

Is this what presentness is? When is there ever something before our minds (i.e., in our consciousness) that has no relation to anything else? How could we identify it?

(141) Presentness is the first category, named “Quality.” Emotion is composed of Quality. The second category is “Struggle,” implying interaction between at least two things. There would be no “struggle” if the two things were not reacting in some way.

(142-3) Struggle is the fundamental aspect of experience, and that is almost self-evident.

I have omitted here what appears to me to be a tangent in Peirce’s lecture. Peirce dismisses determinism and then argues about whether or not “law” is a force and whether or not this is “intelligible.” What does it mean to say that force is “intelligible?”

(144) Experience is the only way we learn. Experience teaches by “surprises.” An example of a surprise is a ship unexpectedly hitting a rock. Experiments increase the number of surprises.

(145) Surprise forces two, separate items before our minds: “ego” and “non-ego.” At the moment of surprise they are both present. The production of these two items is not under our control (i.e., they arise from the subconscious) so there is no sense in judging them to be either good or bad.

I would define “ego,” as Peirce uses the term, to mean “what we were thinking was how the world worked” and “non-ego” to mean “how the world really works (perhaps).”

(146) How do we recognize it when we are surprised? It cannot be that we infer the surprise because the surprise is forced upon us: our consciousness is split and there is a struggle.

(261) (footnote 2) Do we surprise ourselves or do we infer the surprise? Neither path is reasonable. Rather, non-ego—the world around us—surprises us.

(147) Surprise sets off a struggle, a Reaction. If, in this struggle, the non-ego side collapses, then we attribute the experience to Perception. That is, we say that we correctly understood what the world was saying to us. If, on the other hand, the ego side collapses, then we attribute the experience to Imagination. That is, we say we only imagined what we thought the world was saying. In between these extremes, the struggle is more energetic.

(148) A “genuine” form of struggle involves two items that are different; a “degenerate” form involves two items that only appear to be different. The genuine/degenerate dichotomy is

sometimes expressed as objective/subjective, outward/inward, true/false, good/bad dichotomies.

(149) The third category—the first two being Quality and Surprise—involves a sign. We judge what we see, whereby we associate it with signs. The third category, which is a triadic relationship, has two “degenerate” forms. In one form, A is related to both B and C, but B and C are not related to each other. In the second and more degenerate form A is a sign of A to A.

I suppose that this second form is “more” degenerate because everything can be thought of as a sign of itself to itself?

(261) (footnote 3) This third category is the “category of *representation* or *thought*”; it is the category of “*Thirdness* or *mediation*” (emphasis in the original).

I do not understand the degenerate forms of Thirdness. The example that Peirce gives—of Consciousness being a “representation of itself to itself”—has no meaning to me. I can think about being conscious, and I can think about thinking about being conscious, but I do not see a “representation” here. (Meanwhile, the significance of all of Peirce’s comments about “degeneracy” seem pointless.)

#### (150) **Part B: On Phenomenology (Draft Two)**

Lecture One described pragmatism, noting its worth and the importance of verifying its truth. There are points in mathematics in which pragmatism seems to have no bearing, because the points seem to have no practical bearing. This lecture is intended to determine the “meaning or significance of any phrase or conception.”

(151) Mathematics does not concern itself with the correspondence between its theories and reality. Philosophy is unique in that it does not generate experiments but uses everyday experience. Metaphysics provides a *Weltanschauung*; phenomenology provides an understanding of “appearance”; and the normative part of philosophy distinguishes between good and bad.

(152) There are certain phenomenological questions, the answers for which will concern pragmatism. To answer these questions, one needs to be able to do the following: (1) to see things as they are, (2) to follow an intellectual path, and (3) to generalize away inessentials. Phenomenology’s goal is the establishment of “categories” that are the building blocks of phenomena in a manner that is similar to the way that the chemical elements are the building blocks of material. There are two types of categories: “particular” and “universal.” Hegel’s “three stages of thought” [presumably, thesis, antithesis, and synthesis] are the correct universal categories, though Hegel does not call them categories.

(153) The three categories are both necessary and sufficient. Other philosophers err by ignoring one or more of the categories. If we name the three categories A, B, and C, and if a given metaphysics can accept any combination of those three categories, then there are exactly seven types of metaphysics, characterized by the categories accepted, namely, A, B, C, AB, AC, BC, and ABC.

Pierce has left out the eighth type of metaphysics, the one that accepts none of the three categories. Would an anti-rational approach, such as that espoused by the Zen Buddhists, fit here?

(154) The first category is “Quality of Feeling.” It is independent of anything else, in the sense, I believe, that it does not require a context. It is “presentness.” The blue of the sky is an example.

Granted, the sensors in our eyes act in a particular way when exposed to blue. And somewhere in our subconscious minds there is only the blue without the context of the sky. But what is served up to our conscious minds, what “pours in upon us,” as Peirce puts it in one place (page 220), is the blue sky with all of its attendant constellation of meaning. Our conscious minds insist upon that meaning and will, I believe, fabricate meaning of some kind—any kind!—if necessary.

(155) The second category is Struggle. It requires two parties, each exerting force. This is true of objects in the world around us, such as half-open doors that we might choose to push upon, and also true of the world within us, such as constructing mental images that we might choose to rotate or otherwise manipulate.

(156) This “struggle” is not a special phenomenon particular to humans, and it is not reducible to other phenomenon but is a result of two conflicting parties.

(157) Humans are able to hypothesize scientific laws because we are part of the universe. So the struggle we perceive is a function of our integration with all that is around us. In general an anthropomorphic idea is more probably correct than a non-anthropomorphic one. For example, it is more likely that the “old-fashioned God” is correct than the “modern patent [sic] Absolute.”

(158) Law implies active force, just as a legal court is of no value unless there is a sheriff ready to enforce the findings of the court. The struggle is more than just two parties in conflict: it is representative of law.

(159) We learn by experience. We are able to generate many hypotheses, some true, but most of them false. It is “surprise” that winnows out the false ones: “A ship is sailing along in a smooth sea, the navigator having no other expectation than that of the usual monotonous voyage, when suddenly she strikes upon a rock.” Experiments increase the number of surprises.

One could say that experiments are an attempt to increase the number of surprises we encounter, thereby winnowing the set of hypotheses, thereby coming closer to the truth. This is a concise definition of the scientific method. Note that it implicitly assumes that one chooses an area that is fertile for surprises.

(160) Oddly enough, we humans do not teach each other as experience does. No one advocates teaching via surprise, which involves, “practical jokes, mostly cruel.” The surprise consists of Ego—what we expected—suddenly confronted by Non-Ego—a “Strange intruder”—something at odds with what we expected. We should be able to confirm this description from our own experience. The surprise is not a conscious activity.

The surprise associated with experimentation is accompanied by a sense of satisfaction, relief, even delight—Oh! So that's how it works!—because surprise confirms that one has found out something about the world around us.

(161) The Ego and Non-Ego react to each other. This is the “doctrine of Immediate Perception,” accepted by dualists and rejected by idealists.

### **Part B: On Phenomenology, or the Categories (Draft Three)**

The categories are based on common sense.

(162) Testing the simplest hypothesis first (i.e., Ockham's razor) is a principle of scientific research. However, it is of no help in our everyday lives. Philosophy is based on Ockham's razor: it is all nominalistic (as opposed to realistic). Hegel's philosophy is especially nominalistic.

I think Ockham's razor applies to our everyday lives as much as it does in scientific research. I do not see the difference between the two except that in scientific research we deliberately choose areas in which we can control all of the variables.

(163) Nominalism is the basis of everyday thought for the “average modern mind.” Mechanics, it is presumed, can explain everything (i.e., Cartesianism). But ideas have an effect upon matter. Darwin's notion of evolution will eventually show the error of the mechanistic view.

Peirce considered himself a dualist.

(164) Physicists, who delve into mechanics and thus should be the ones to know, are apt to deny Cartesianism.

(165) As a refutation of Cartesianism, Peirce suggests that there is no mechanical explanation for the effect of molecules that twist light to the left vs. to the right.

## 3 Lecture Three: “The Categories Defended”

In this lecture, Lecture Three, Peirce argues that his three categories—Firstness, Secondness, and Thirdness—are both necessary and sufficient. Peirce explains the meaning of “icon,” “index,” and “symbol,” each an element of the three categories, respectively.

### 3.1 Turrisi: Commentary On Lecture Three

(49) The categories to which Peirce refers in the title of this lecture are “sensation, perception, and thought” (a.k.a. Firstness, Secondness, and Thirdness), and his “defense” consists in arguing that the three are each fundamental and none of them can be reduced to any of the others.

A computer scientist might say that the three categories are primitives (in the sense that they cannot be further decomposed, that they come to us without being able to be defined, as “point” and “line” come in geometry) and disjoint (they are orthogonal, like vectors in non-intersecting planes).

(50) Peirce explained the “genuine” forms of the categories by describing their “degenerate” forms. The fundamental nature of the categories is intended to help us understand what it means to know something. Peirce presented an analogy that compares consciousness to maps. We need to understand thought to be able to understand how pragmatism helps thought.

#### A General Theory of Modeling Applied to Thought

Not all of thought is conscious, so we view only part of the territory. Unlike other philosophers of the time, Peirce considered both subjects (i.e., thinkers) and objects (i.e., what thinkers think about). Peirce did not separate “noumena” from “phenomena,” as Kant did, but he considered all things before the mind to be phenomena.<sup>20</sup>

(51) Peirce was most concerned with a subset of phenomena, namely thoughts. Peirce used a model to explain thought. A model imitates an object by imitating relationships.

That is, both the model and what it represents are systems.

(52) Of the many types of models possible, Peirce favored the mathematical ones that represent relationships logically.

(53) Peirce’s term “representamen” is what we would today call a model. It is a representation and thus a form of Thirdness. Turrisi argues that Peirce’s text is itself a model of thought.

Using Peirce’s terms, Lecture Three is a representation of thought. As we read the lecture, we are “running” a “thinking” model. If the text were, say, an explanation of how to solve

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20. Kant “asserted that things of our experience, called phenomena, may be known, but that the mind could never practically know things-in-themselves, or noumena, which cannot be sensuously perceived. Phenomena, which can be perceived in the pure forms of sensibility, space, and time, must be understood to possess those characteristics which constitute our categories of understanding” ([5], Kant entry). If noumena cannot be known, what sense is there in even giving them a name?

an algebra problem, then it would be easy to understand what the lecture means: as we read the text, we move step by step through the explanation; we are running the model, and by so doing we see how to solve algebra problems. However, when the text is about thought, then there is a recursive aspect to the model that makes it abstruse.

### **The Definitions and Value of Degenerate Forms of Thirdness**

A symbol, for Peirce, succeeds only because of how it is interpreted.

(54) There are “genuine” representations and “degenerate” (also called “partial or reduced”) representations. The problem is not with the symbol but with the object: the object cannot be fully represented. A non-genuine symbol is an “icon.” For example, a statue of a centaur is an icon: it cannot fully represent a centaur because centaurs do not exist.

That is, a representation cannot be genuine of an object that does not exist because the representation cannot be compared with the object.

An “index” has its own relationship to the object and exists independently of interpretation. However, interpretation connects the index to the object. The example that Peirce gives is of a hygrometer. The hygrometer represents humidity, even if no one is aware of that, but interpretation makes the connection.

(55) The play *Hamlet* is itself a symbol of Shakespeare’s thought, but the play within *Hamlet*, *The Mouse-trap* in Act III, is not a symbol but rather an icon: the inner play exists and relates to the action it portrays, but the players within *Hamlet* give the play an added interpretation.

These are difficult examples. Easier are the examples of (a) a drawing of a fire using only several lines, (b) smoke, and (c) the word “fire,” for icon, index, and symbol, respectively, or the following description: “(1) an icon, which resembles its referent (such as a road sign for falling rocks); (2) an index, which is associated with its referent (as smoke is a sign of fire); and (3) a symbol, which is related to its referent only by convention (as with words or traffic signals).” ([8], “semiotics” entry, volume 10, page 627)

The degenerate forms of Thirdness represent (1) things about which we can think and (2) models of thought as well. Both of these are models to which pragmatism can be applied.

Why are these degenerate? I have a pencil before me; it is in the set of things about which I can think; it is also real; so why is a symbol in my mind of that pencil degenerate?

Peirce presented a recursive map as a model of consciousness.

(56) The map shows a certain territory. Imagine that within that map there is a second map of the same territory, and that within that second map there is a third map, “and so to infinity.” If such a map were faithful to the territory, then it would have to *be* the territory, and no longer a map. Representations are thus by definition “degenerate.” Every object is a mixture of the three categories.

Are all representations thus degenerate? But a “symbol,” independent of Peirce’s use of the word, can represent *more* than the object it symbolizes. A national flag is an example of such a symbol. How does Peirce account for this?

### 3.2 Peirce: Lecture Three

Note: This lecture consists of six sections, each denoted with a Roman numeral.

(167) I.

There are three fundamental categories: “Firstness,” “Secondness,” and “Thirdness.” Firstness is independent of anything else. It is a “Quality of Feeling.” Secondness is a “reaction.” Thirdness is a “representation.”

Firstness has no “degenerate” (or “weakened”) form. Secondness has a degenerate form, for example: “Psychological Reaction.” This can be “Willing” or “Sensation.” The former is a stronger form of Secondness; the latter is a weaker form.

(168) Thirdness has two forms of degeneracy: “Irrational Plurality” and a “dark instinct of being a germ of thought.”

I do not understand either form of degeneracy, nor the discussion of degenerate forms of Secondness.

A set of recursive maps can represent “pure self-consciousness.”

Peirce assumed that each of the maps he described is “infinitely minute.” This suggests that the maps provide an unbounded degree of detail. I suppose we could agree that the territory also provides an unbounded degree of detail because we could “zoom in,” so to speak, on any piece of the territory an unbounded number of times. But if the map can do this as well, then it is incorrect to call this a “map” because it *is* the territory, not a map.

(170) Thirdness has three types, one relatively genuine, a second somewhat like Secondness, and a third somewhat like Firstness, corresponding to the three types of signs: “symbol,” “index,” and “icon,” respectively. A word, perhaps “centaur,” is an example of a symbol; a hygrometer (for measuring humidity) is an example of an index; a statue of a centaur is an example of an icon.

What would an index for a centaur be?

An index has a degenerate form, such as a landmark, whose relationship to the item is based on convention, for example, and a genuine form, such as the example of the hygrometer, in which the index has some integral relationship to the item.

So “degeneracy” is not related to the realness of the object but rather in the integral (or non-integral) nature of the connection between the symbol, index, or icon and the referent?

(171) Symbols are of three types: Term, Proposition, and Argument, which require one, two, or three parameters, respectively.

## II.

The three categories define the seven, possible types of metaphysics—those that accept/reject each of the three categories. So if we name the categories F, S, T, the seven sets are  $\{F\}$ ,  $\{S\}$ ,  $\{T\}$ ,  $\{FS\}$ ,  $\{FT\}$ ,  $\{ST\}$ ,  $\{FST\}$ , where “ $\{FS\}$ ” means that the metaphysic acknowledges the existence of Firstness and Secondness but denies the existence of Thirdness.

Condillac’s metaphysic, for example, accepts only Firstness and is thus an example of  $\{F\}$ .

(172) Helmholtz’s corpuscularian metaphysics accepted reaction only, it appears, and is thus an example of  $\{S\}$ . Hegel’s metaphysics is an example of  $\{T\}$ .

The metaphysics that accepts only two categories include the nominalists ( $\{FS\}$ ), Berkeleyans ( $\{FT\}$ ), and Cartesian metaphysics, along with Spinoza and Kant ( $\{ST\}$ ). These different combinations are shown in Table 3 below.

**Table 3 Combinations of Categories (Lecture Three)**

Combination	Categories Accepted			Proponents
	Firstness	Secondness	Thirdness	
$\{\}$ <sup>a</sup>				?
$\{F\}$	X			Condillac
$\{S\}$		X		Helmholtz
$\{T\}$			X	Hegel
$\{FS\}$	X	X		nominalists
$\{FT\}$	X		X	Berkleyans
$\{ST\}$		X	X	Cartesian metaphysics, Spinoza, Kant
$\{FST\}$	X	X	X	Peirce

a. I have added this eighth category for completeness.

Is there a metaphysic that denies the existence of all three categories, i.e.,  $\{\}$ ?

## III.

All three categories exist. They are independent of each other and, together, they can account for all thought. Enough was said in Lecture Two about Firstness. The “logic of relations” implies Secondness.

(173) Schroder, like the hedonists, wrongly assumed that logic (Secondness) is based on feelings (Firstness).

(174) But a feeling cannot feel anything about the feeling.

Or, more simply, the statement “This statement is false” shows that it does not make sense to say that every statement provides its own support.

(175) Propositions (i.e., logical statements) use a symbol that represents an object. The symbol and object are distinct...

(176) ...and thus propositions are elements of Secondness.

(177-8) If feeling were based on feeling, as Sigwart held, then there would be no distinction between truth and falsehood. But Sigwart's position can be trivially refuted by anyone claiming to feel good about their refutation of Sigwart's position.

#### IV.

While Secondness involves two parameters, Thirdness necessarily involves a third. For example, if we say that X reacts to Y, we can also say that Y reacts to X. The description differs only in the viewpoint that it represents because the reality is that X and Y react to each other—the relationship is symmetric. However, "giving" is an example of Thirdness because not only does it involve some X and some Y, but it also involves some Z that represents "ownership."

Or, to put it another way, "X gives Z to Y" is materially different than "Y gives Z to X."

(179) A genuine index could be a photograph, for example. By comparison, an icon could be a drawing that represents the object photographed.

(180) A degenerate index is related to an object by agreement. A proper name is an example of a degenerate index. It provides no information in and of itself.

(181) Formal fallacies in logic are due to misuse of "Anything" (i.e., for all) and "Something" (i.e. there exists).

Peirce notes that "All men are mortal" should be written "Anything is mortal or else not a man."

(182) Mathematics is almost free of this problem because it confines itself to relations between "single objects" (a set of objects is also a single object).

(182) Kempe argues that Thirdness can be reduced to Secondness because a (mathematical) graph, which consists of nodes and edges, can represent mathematical relationships. The ten-ray theorem<sup>21</sup> supports this position.

Kempe can be refuted via three arguments.

The first argument is that a graph is written on a surface, which represents the third category.

(183) The second argument, which seems specific to the nine-point theorem,<sup>22</sup> is that the

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21. The "ten-ray theorem" is also known as the "theorem of Desargues," according to the Internet search engine Alta Vista. Unfortunately this does not explain what the ten-ray theorem is. Google returns no site when directed to search on the "ten-ray theorem."

22. The "nine-point theorem," according to a site that the Internet search engine Google finds, states that "the circle that passes through the feet of the altitudes [of a triangle] passes also through the midpoints of the segments that join the vertices to the orthocentre," where the "orthocentre" of a triangle is "the point of intersection of the three altitudes" (and an "altitude" is the line perpendicular to a side and passing through the opposite vertex).

important relation is a triple—the three rays share a common point (i.e., copunctual)—which requires a new type of edge.

(184) The third argument is that Kempe does not deal with “infinite collections.” But consider a graphical system in which (a) nodes represent predicates, (b) arcs represent relations, (c) the page upon which the system is written represents the “Universe of Truth,” and (d) circles represent negations (circles enclose predicates and relations that are outside of the Universe of Truth (the default is to be connected)).

Peirce mistakenly portrays the arcs as edges. He seems to give two different definitions of the same graphical system instance.

(185) This graphical system is the simplest possible.

(186) Thirdness represents an idea that is “unanalyzable” (and hence Thirdness is not reducible to any combination of Firstness and Secondness). The reader is encouraged to explain the concept of representation without introducing Thirdness, and then explain “A gives B to C.”

(187) And finally the reader is challenged to explain the idea of some convolvement of two items—i.e., explain  $Z = XY$ —without Thirdness.

## V.

Hegel argued that Thirdness alone is sufficient. But actually the concept of Thirdness assumes (but does not subsume) the concepts of Firstness and Secondness.

(188) Thirdness could be pure reason. The following is an example of Secondness (a.k.a. Reaction): “Yet if while you are walking in the street reflecting upon how everything is the pure distillate of Reason a man carrying a heavy pole suddenly pokes you in the small of back...” You and the pole react. An example of Firstness (a.k.a. Quality) is seeing the color red.

## VI.

The next lecture (Lecture Four) will consider the sufficiency of the three categories and their reality (i.e., that they exist independent of the mind).

## 4 Lecture Four: “The Seven Systems of Metaphysics”<sup>23</sup>

In this lecture, Lecture Four, Peirce establishes the existence of Thirdness, then Firstness, and then Secondness. The order is significant: it represents a decreasing order with which we can accept existence. That is, we find it hardest to accept the existence of Thirdness and easiest to accept the existence of Secondness.

### 4.1 Turrisi: Commentary On Lecture Four

(59) The title notwithstanding, the topic of this lecture is the existence of the three categories. Of the three, it is most important to establish the existence of Thirdness, followed by Firstness, and then finally by Secondness.

#### The Reality of Thirdness: A Condition for the Possibility of Science

We can abstract a similarity (or regularity), given a set of events. This similarity is due either to chance only (i.e., randomness) or to law.

(60) Chance can account for any behavior. Theories based on chance are thus not falsifiable, implying that they can not provide us with any information.

The question is not whether there is chance or law. (That is a question that we are unable to answer.) Instead, the question is, What do we stand to gain by assuming chance as opposed to law? We gain nothing by assuming chance and we stand to gain something by assuming law. So we assume law. But chance might nevertheless still be the reason for the perceived similarities.

(61) Theories developed under the assumption that there is chance cannot be proven but theories developed under the assumption that there are laws can be proven.

No, law-type theories can only be disproven. What we gain are theories that have withstood falsification efforts, providing a growing confidence that the theories are true. (Note that this is a pragmatic approach.)

(62) Science is based on the assumption that there are laws. There would be no reason to run experiments if there were no laws (“some active general principle”).

#### The Reality of Firstness and Secondness: The Universe as an Argument

Firstness involves both a “perception” and a “perceptual judgment.” Firstness is a type of inference—because it draws conclusions based on premises—over which the conscious mind has no control. As a result value judgments (i.e., “good” and “bad”) are inappropriate. In this way, Turrisi claims that Peirce addressed illusions and delusions.

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23. Actually there are eight possible systems, as we saw above (Lecture III, page 172, (page 32 herein)) and as we will see below (Lecture IV, page 189 (page 36 herein)).

But we have no choice but to impose a value judgment on illusions and delusions. They are errors *by definition*.

I thought that “perceptual judgments” are a function of Firstness, not Thirdness because perceptual judgments involve a generality (Lecture VI, page 221 (page 48 herein)).

(63) Humans are integral with the universe. The premises and process of Firstness are natural, as we would use the word today. The universe can thus be seen as an “argument,” i.e., of some logical form such as deduction: given A and B, we can conclude C. The “mind of God” established the relations; we perceive them as phenomena; their order enables meaning. Meanwhile, the world impinges on us via Secondness: it is more than simply feelings. For example, surprise (a feeling) is a reaction (a Secondness) to the world.

(64) Surprise is an inference, because one thing was expected but another thing occurred, but surprise is not consciously generated. The universe itself, both biological and non-biological parts, is developing.

## 4.2 Peirce: Lecture Four

(189) I.

Firstness is associated with “Quality,” Secondness with “Reaction,” and Thirdness with “Representation.” There are a number of combinations of these three categories, most of them associated with a form of metaphysics, as shown in Table 4.

**Table 4 Combinations of Categories (Lecture Four)**

Combination	Proponents as listed in...	
	...Lecture Three <sup>a</sup>	...Lecture Four <sup>b</sup>
{}	?	
{F}	Condillac	“Nihilism so-called; and Idealistic Sensualism.”
{S}	Helmholtz	“Strict individualism. The doctrine [of] Lutaslawski and his unpronounceable master.”
{T}	Hegel	“Hegelianism of all shades.”
{FS}	nominalists	“Ordinary Nominalism”
{FT}	Berkleyans	“Berkeleyanism.”
{ST}	Cartesian meta-physics, Spinoza, Kant	“Cartesianism of all kinds, Leibnizianism, Spinozism and the metaphysics of the Physicists today”
{FST}	Peirce	

a. see Table 3 on page 32.

b. All quotes in this column are from page 190.

Table 4 is slightly different than Table 3 on page 32 from Lecture III. The {F} class includes Nihilism and Idealistic Sensualism, the {S} class includes “strict individualism” and

Lutaslawski, the {FS} class includes “ordinary nominalism,” and the {ST} class includes “the metaphysics of the Physicists today.”

Peirce considered himself an Aristotelian of the “scholastic wing, approaching Scotism, but going much further in the direction of scholastic realism.”

(190) Aristotle noted that humans are able to be in the present, as well as in the future. Hegel tried to formulate the same two modes but failed because Hegel only believed in being in the present. Meanwhile, all of the first seven systems of metaphysics described above fail.

Being in the present and the future is, I suppose, a way we might describe the existence of focus and hopes, plans and expectations.

## II.

Thirdness is more than a product of the mind. Consider a “silly experiment” of letting go a stone to see if it will fall.

Peirce argues that the stone will fall if there is “no obstacle between it and the floor.” But this depends greatly on what is meant by “no obstacle.” For example, is a powerful fan, blowing upwards from the floor, an “obstacle”?

(191) We all know that the stone will fall, based on experience.

No, we only have confidence that the stone will fall. It could be that experience is of no help: perhaps at each instant in the past when we performed the experiment, our tiny part of the universe that we occupied at the moment just happened to be in a stone-falling mode.

The theory of falling objects is a type of representation. That does not in and of itself make the theory real, i.e., give it existence outside our minds. A reaction, on the other hand, is evidence of something real outside our minds. A theory, a Thirdness, “corresponds” to reality and can cover future events.

(192) Hypotheses are based on some perceived regularity. The regularity is attributable either to chance or to some cause.

(193) “Scholastic realism” argues that the regularity we experience around us is not due to chance, that there is some cause. That cause is a set of “general principles.”

Peirce explicitly subscribed to the Scholastic realism school.

## III.

A generality, such as a theory, is a representation but it circumscribes more than all possible instances. Thirdness describes the aspect of “Betweenness or Mediation” of an object.

How can there be more than “all possible instances”?

(194) Thirdness is a “synonym” for “Representation” (hence the meaning of “Betweenness or Mediation”). A “general principle” operates in the world the way a Representation (or a

symbol) does. Words, for example, are Representations, and words, such as Patrick Henry's, have an effect on the world. Words can have an effect independently of who spoke them. But we do not know how words effect the world. We know that thoughts affect and are affected by the world—perhaps words affect thoughts. In the same way the “laws of nature” effect the world. A law is only a symbol. Perhaps these laws are God's thoughts, “ideas or resolutions in the mind of some vast consciousness.”

**(195) The Reality of Firstness**

People think that Quality (i.e., Firstness) exists only in the mind. The “older” physicists believe that the interaction of molecules was due to a law, in particular the law of force, implying a belief in Thirdness. These physicists also believe in Secondness because they believe in reactions. But they think Firstness exists in the mind only.

(196) The process of inference is a conscious activity and thus subject to the critique of logic which weeds the good from the bad. The subconscious uses a similar process but it is not “inference” because it is outside of conscious control: it does not make sense to judge whether this process is good or bad.

(197) There are two objections to this train of thought. First, that logic has been reduced to psychology. But, logic is independent of psychology. Second, that logic has been reduced to morals, which are esthetics, which reduces to hedonism. The reply to this objection is based on a point made in the next lecture (Lecture V, page 210 (page 43 herein)).

(198) Humans want to avoid pain. The reason for this, it is supposed, is that there is a commonality to different types of pain. But there does not appear to be any commonality.

(199) Thus the second objection is answered.

First a precept is formed, then, sometime later in the process, a judgment about the precept is formed, and then, sometime later, cognition begins. The activity prior to cognition is subconscious and uncontrollable. Thus there is no sense in criticizing the goodness or badness of this part of that activity but only in judging its consistency. Precept formation and perceptual judgment generate the premises of our reasoning. Physicists dismiss this activity as illusory because it is outside of their theoretical structure. This dismissal is infantile.

I present my understanding of the relationship between “precept formation,” “perceptual judgment,” and “cognition,” as Peirce describes them, in Figure 1.

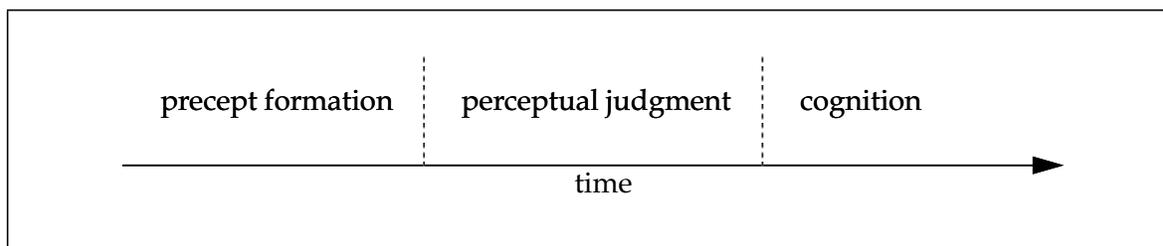


Figure 1 Steps to Cognition (my own construction)

(200) Both illusions and hallucinations (and, it appears, delusions) are real experiences, but that is not sufficient grounds to doubt the truth of what our senses report.

(201) The universe is a “vast representamen.” It is an “argument,” perhaps as all art (e.g. poetry, painting, music) is an argument. The premises of Nature are “all the independent uncaused elements of fact.”

### **The Reality of Secondness**

One objection to the claim that the three categories are independent is that Firstness and Thirdness can explain Secondness, that Secondness is a “succession of feelings.”

(202) The “easiest” reply to this objection is to use the experience of surprise. When we are surprised we know that we are surprised. How do we come to this knowledge? If Secondness can be reduced to Thirdness and/or Firstness, then we come to the knowledge either by inference (a Thirdness) or by perception (a Firstness). If it is by inference, then we run counter to what happens in surprise, because the surprise forces itself upon us. If, on the other hand, we argue that it is by perception that we know we are surprised, then how do we explain the ego/non-ego conflict inherent in surprise?

(203) Because perceptual facts arise from the subconscious there is no sense in judging them either good or bad. There is sense only in judging their consistency.

## 5 Lecture Five: “The Normative Sciences”

In this lecture, Lecture Five, Peirce describes the normative sciences—esthetics, ethics, and logic. The goal for each is to determine possibilities, not standards of conduct. At the end of the lecture, Peirce describes the three kinds of arguments, namely abduction, induction, and deduction.

### 5.1 Turrisi: Commentary On Lecture Five

(65) In this lecture Peirce intends to use the relationship between the three normative sciences (i.e., esthetics, ethics, and logic) to explain how we figure out what anything means.

That is, logic is a proper subset of ethics, which, in turn, is a proper subset of esthetics.

But pragmatism also needs an understanding of the larger question of the purpose of philosophy. Peirce considered that his view of phenomenology would help.

Peirce considered that esthetics is a proper subset of phenomenology, which is where Peirce’s three categories come in.

#### The Proper Division of Philosophy

Philosophy is a science that, unlike other sciences, does not generate facts but confines itself to those facts that are already available to all of us. The first question is, What are the building blocks of those facts?

Peirce calls the “facts” the “universal phenomena”; and the “building blocks” he calls the “universal Categories or Elements of the Phenomenon.” I believe that they are to philosophy what the elements of the Periodic Table are to chemistry: they constitute the world around us.

(66) The three divisions of philosophy are (1) phenomenology, (2) the normative sciences, and (3) metaphysics. Phenomenology is the study of the Firstness of phenomena. That is, the phenomena themselves. The normative sciences are the study of our interaction with phenomena, which is a Secondness. Metaphysics is outside of the scope of these lectures.

The normative sciences study the purpose of our interaction with phenomena.

I understand this to mean “the purpose to which we can apply our interaction with phenomena.”

(67) Philosophy is based on mathematics, in Peirce’s view, but in these lectures Peirce did not pursue mathematics. In particular he did not pursue “multitude and continuity.”

#### The Foundation of the Normative Sciences in Esthetics

Peirce never developed a significant esthetics, though he noted its role as the foundation of the normative sciences.

(68) Pragmatism cannot be understood without first understanding the more fundamental normative sciences, namely esthetics and ethics. Esthetics, ethics, and logic correspond to Firstness, Secondness, and Thirdness, as well as to Feeling, Reaction, and Thought. Consciousness exists in Feeling, Reaction, and Thought.

Good and bad can be judged by logica docens and logica utens.

(69) Peirce provided a classification system for esthetics. He equated esthetic goodness with suitability and with clarity of reaction. For example, a Kentuckian thinks that all types of whiskey are (esthetically) good, presumably because all of them are suitable for a purpose, namely as an alcoholic drug, and they are clearly whiskey.

(70) The extent of an item's esthetic goodness can be gauged by the strength of the reaction that it engenders in us. That is, we respond to something that is esthetically good, even if it sickens, frightens, or otherwise unsettles us. Note that esthetic goodness is independent of pleasure. We do not respond to something that is esthetically bad. We can train ourselves to be more esthetically aware.

Turrisi notes that Peirce's concept of esthetic badness (i.e., that to which we do not respond) is "barely conceivable," suggesting to me that Peirce's notion of esthetic goodness and badness is of limited value. As Peirce notes, "I am seriously inclined to doubt there being any distinction of pure esthetic betterness and worseness."

Esthetics deals with our reaction (i.e., Secondness) to phenomena.

(71) The normative sciences deal with ends (i.e., purposes). Esthetics, ethics, and logic deal with ends based on feelings, action (and reaction), and representation, respectively. Ethics is built on esthetics because ethics uses a proper subset of feelings—only those that are "deliberate"—upon which to direct action.

(72) We make ethical choices to conform to a pattern we feel to be admirable (i.e., esthetically worthwhile). The purpose of the normative sciences is not to provide guidance on how to live but rather on how to understand what is possible in the focus areas of the normative sciences.

(73) Like Schiller, Peirce believes that we can learn better esthetic sense.

### **The Role of Ethics in the Determination of Ultimate Aims**

Ethics, as a normative science, focuses on what is possible. Ethics requires choice. A bad ethic is one that presents no choice. This only applies if the ethic has no final goal, when all roads are deemed the same, because only then is there no basis for decision. The "special sciences," such as psychology, cannot help here. In fact, what people naturally do has no bearing on the efficacy of esthetics, ethics, or logic.

(74) The reason that what people naturally do is of no bearing is that the purpose of the normative sciences is to determine what purposes are possible, what rules would always apply, given an unbounded extent of time. A candidate purpose is one that meets two conditions: (1) we think it is right and (2) it is in harmony with the world around us in the sense that it does not force us up against laws that would prevent its fulfillment.

People in their everyday lives are inherently short-sighted, from Peirce's perspective, and thus not in a position to speak about absolute purposes. But even if we were sufficiently far-sighted, do we know enough about the laws that would constrain such purposes to enable us to be in a position to separate the possible from the impossible?

### (75) **The Good of Logic**

According to other philosophers, logical goodness consists of two parts: "logical" truth, such as the results of formal arguments, and "material" truth, such as is inherent in propositions. In terms of logical goodness, the propositions are more important than the conclusions for two reasons. First, the propositions are accepted as true, by their nature as propositions. Second, the propositions are pregnant with more conclusions than we have been able to derive.

The logical goodness of a conclusion depends upon the type of argument by which it was derived. There are three types of arguments: abduction, induction, and deduction.

## **5.2 Peirce: Lecture Five**

Note: This lecture consists of two parts.

### (205) I.

Peirce developed philosophy in a thorough manner. He would consider all of the (reasonable<sup>24</sup>) arguments concerning a given point. He would apply to these all of the criticism of which he was capable. He would review the arguments and criticisms many times. He would put aside his arguments and criticisms so that approximately a year later he could approach the point with a fresh point of view, whereupon he would again generate arguments and criticisms, and would compare these with the previous list(s). He would repeat this procedure multiple times. Each of the points he presents in these lectures he had considered at least four times. The majority of the points he had considered at least a dozen times. (Turrisi also describes Peirce's method for developing philosophy (Lecture II, pages 41-5 (page 22 herein)).)

(206) Peirce placed confidence in his approach. Granted, it was slow, but Peirce presented it as a model for philosophizing.

(207) Peirce noted that his approach was fine-grained, so much so that in the time allotted for the delivery of the lectures he had time to present only the primary conclusions and only suggestions of the arguments by which he arrived at them. Peirce did not want to mistake this brevity for a coarse-grained approach, which he abhorred. He considered that his audience did not understand logic as he well as he did: the subject was not adequately taught at universities, in his opinion.

Peirce's purpose in describing how he philosophized was to notify his audience that his approach was in fact fine-grained even though it would appear, due the constraint of the lectures, to be coarse-grained. Also, Peirce noted that a conclusion should not be accepted until one understands the arguments that lead to the conclusion.

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24. How is this determined?

## II.

Philosophy is a "Positive Science, or Science of Fact," meaning that philosophy does not generate facts but uses what is everyday before us. Philosophy does not generate facts because philosophy does not need to generate facts: Peirce argues that "nobody doubts or can doubt" what Peirce calls "*common experience*" (emphasis in the original).

(208) Philosophy is divided into three parts: phenomenology, the normative sciences, and metaphysics. These parts correspond to the categories of Firstness, Secondness, and Thirdness, respectively, which correspondence lends credence, in Peirce's mind, to the efficacy of those categories. The normative sciences are themselves divided into three parts: esthetics (which pursues "Beauty"), ethics (which pursues "Right"), and logic (which pursues "Truth").

(209) All three parts of philosophy deal with phenomena. Phenomenology focuses on their direct nature, thus phenomenology deals with Firstness. The normative sciences focus on how phenomena relate, via laws, to purposes, thus the normative sciences deal with Secondness. And metaphysics focuses on the lawful nature of that law, thus metaphysics deals with Thirdness.

The normative sciences are theory. It is not their purpose to provide practical guidance. It just so happens that people feel, act, and think in accord with the results of the normative sciences, but that lends no weight to those results.

(210) The normative sciences are distinct from mathematics for three reasons. First, the hypotheses of the normative sciences are facts; in mathematics they are ideals. Second, the process that normative science uses is not deduction, as it is for mathematics. And third, the normative sciences study the purposes to which phenomena serve, whereas there is no concept of purpose in mathematics.

It is a mistake to think that the purpose of the normative sciences is to separate the good from the bad logically, ethically, or even esthetically. If that were not a mistake, then the normative sciences would be concerned with quantity, i.e., how much good or bad. But the normative sciences are interested in quality, i.e., the type or kinds of truth, right, and beauty.

(211) What is the goodness that is free from error, as opposed to the goodness that achieves some end? One of the problems of traditional philosophy is that it confines the normative sciences to human activity, as though mind existed in human pineal glands only, as Cartesians suppose. Meanwhile, few logicians acknowledge that esthetics and ethics are normative sciences. However, the division shown above (page 208) is based on the three categories. The purpose of the three normative sciences is the study of what leads to feelings (esthetics), what leads to actions (ethics), and what leads to representations (logic).

Peirce was slow in his philosophical development to include ethics and was still unsure about his development of esthetics.

(212) The normative sciences assume both volition and an ideal. Esthetics is the study of what ideals we can admire (and thus what ideals we have the opportunity of choosing); ethics is the study of what ideals to which we can conform our action; and logic is the study of what ideals to which we can conform our arguments (i.e., what arguments we accept as valid). Logic is

based on ethics, which, in turn, is based on esthetics.

(213) Because pragmatism is an element of logic, we must understand logical goodness, which implies that we understand ethical goodness, which, in turn, implies that we understand esthetic goodness. Something is esthetically good to the degree that its parts serve the same end. Something is esthetically bad to the degree that its parts conflict.

Another way of describing Peirce's notion of esthetic goodness/badness is the clarity of our response. Something that is esthetically good will evoke a precise, focused response; something that is esthetically bad might not evoke any response (see Lecture V, page 70 (page 41 herein)).

There may be nothing that is esthetically bad, leaving only different qualities.

Perhaps what Peirce means is that there may be things that are esthetically bad but how would we identify them? They would be unnoticeable, maybe even invisible because they evoke no response in us. Hence we are left with only qualities?

(214) Ethical goodness implies some goal, some maxim of behavior that both (a) applies in all circumstances, and (b) we can choose to ignore. If the goal does not apply in some circumstances, then there is some other maxim that does, and that other maxim is actually the goal. If we are not able to avoid conforming our action to the goal, then the goal has no ethical nature to it. Only if we have no goal are we ethically bad.

But choosing no goal is itself a goal, somehow. It seems, then, that we have no choice: we must have a goal. Perhaps ethical badness consists in choosing all goals, somehow, or not differentiating between possible goals.

Ethics studies possible goals. The special sciences such as psychology are of no help here.

Pragmatism, an element of logic, is intended to help us act. Possible actions can be evaluated only in light of goals. Goals are the purview of ethics. Thus the study of ethics is required to understand the significance of pragmatism.

A goal is a rule that applies in all circumstances and is something that can be achieved. Because we are limited in our ability to discern what can be achieved and what cannot, we have to assume that the goals that interest us can be achieved.

(215) Logic is Thirdness, so an element of logic is a representation. A representation, such as a proverb, must be repeatable and must be related to some object.

(216) Truth derived from logic—"logical truth"—is not superior to truth inherent in propositions—"material truth." The former is one instance of what can be gleaned from the latter, but the latter embodies all that can be gleaned from the propositions.

(217) There are at least two aspects of arguments, their soundness (i.e., the efficacy of the process of the argument) and the extent to which they teach us about the world. There are three kinds of arguments: abduction, induction, and deduction. Only deduction is "necessary," meaning that given the premises, there is no choice but to arrive at the conclusion. Mathematics

uses deduction. Induction is used to test a theory via experiment. Abduction alone generates theories. Science depends fundamentally upon abduction because abduction is fundamental to understanding.

(218) It is not clear how these three kinds of arguments relate to the three categories.

(276) (footnote 3) Perhaps abduction, induction, and deduction relate to Firstness, Secondness, and Thirdness, respectively.

Quality, Relation, and Representation were terms Peirce used for Firstness, Secondness, and Thirdness respectively in 1867.

(219) Mathematical reasoning uses diagrams, each of which is by necessity a special case from which the viewer is to infer the general case, which is a Thirdness.

(220) We do not derive generality. Rather, generality comes to our consciousness as part of perceptual judgments.

## 6 Lecture Six: “The Nature of Meaning”

In this lecture, Lecture Six, Peirce argues that abduction is the process used by the subconscious mind to generate instances of Thirdness. Abduction is the basis for science. Deduction, on the other hand, generates conclusions, based on the results of abduction, and induction tests those conclusions against the world.

### 6.1 Turrisi: Commentary On Lecture Six

(77) In this lecture Peirce intended to address the question of the ultimate meaning of a symbol.

#### (78) Generality in Perceptual Judgments

A general concept or proposition is one that describes a class and is in this sense universal. On the other hand, a singular concept or proposition is one that describes an individual. All singular concepts or propositions depend upon general concepts or propositions for their meaning. For example, the proposition “Tully is Cicero,” which is a singular, depends upon the general concept of identity.

The same parallelism applies to perceptual judgments: they are based on generalities, which are Thirdness. So Peirce says, “Thirdness pours in upon us through every avenue of sense” (Lecture VI, page 224 (page 49 herein)). That is, perceptual judgment is Thirdness.

But how can a proposition about single things involve generality? Consider the proposition that event A precedes event B. This proposition implies that A precedes any event C—a generality—that follows B. In addition, the concept of precedence—a second generality—is transitive—a third generality.

(79) This implies a continuous flow of time—a fourth generality.

You could say that language, even something as basic as mere grunts, relies upon generalities. If someone cannot grasp the notion of a general case, then that person is not in the world of language.

Zenos’ “problem” of Achilles and the tortoise is not a problem because there is no value in assuming that time is a series of disconnected instants: this engenders no meaning.

#### Logical Goodness and Logical Soundness

Logical soundness means not only that the premises are true and the conclusion valid but also that the conclusion corresponds to fact, to how things really are. Each of us by ourselves cannot determine facts.

Facts are determined by a community, not individuals.

(80) Columbus proposed that the earth was spherical, contrary to common sense. The germ theory of disease was also contrary to common sense [contrary, presumably, because at that time there were no means to see the hypothesized “seeds” (i.e., bacteria and viruses) of disease].

On the other hand, a popular theory that does not correspond to what might happen “in this universe or in any universe” is still false.

### **The End of Thought** [i.e., the goal or purpose of thought]

Goodness is measured by how well something serves a purpose. Utilitarianism is pragmatism inasmuch as it serves true or long-term ends, as opposed to short-term ends.

(81) Logic serves the ends defined by ethics, which, in turn, serves the ends defined by esthetics. Logic is not confirmed by a feeling or by noting what most people think. After all, mistakes in Euclid have come to light only after thousands of years of most people feeling good about it, all the while overlooking mistakes.

(82) In addition, people do not have an instinct for correct logic. However, experience can teach us better logic if we are careful. We can use experience to develop predictive hypotheses that can be tested against future experience. This presumes that there is law-like behavior in the world around us.

There are three kinds of predictive hypotheses. The first, deduction, is necessary reasoning: the conclusion must be true—it is necessary—if the premises are true. The second, induction, tests a theory by experiment, the name for an activity that is based on observation. [The third is abduction.]

(83) Deductive reasoning involves the relationship between premises and conclusion. It does not involve the relationship between reality and premises. Deductive reasoning is “diagrammatic”: we build an icon (or model) by developing abstractions based on our focus of attention; we then manipulate the abstractions by refinement, augmentation, and combination.

(84) This abstract reasoning is arduous, hence many people avoid it.

(85) Induction investigates how closely a theory aligns with facts (reality). The soundness of an inductive argument can be measured by the difference between the integer one and the ratio of predictions to reality. The soundness of an abductive argument can be measured by the soundness of the theories it generates.

I think Peirce would say that the metric of soundness is “reasonableness” (Lecture VI, page 231 (page 50 herein)).

Elements of logic are arguments. I believe it is in this light that Peirce speaks of abductive arguments. Deduction begins with premises and generates a conclusion. Abduction has the same general structure but it begins with surprise and it generates theories.

Arguments are generative.

(86) The set of things that an argument can generate is its meaning, in the same sense that colloquially we use the word “meaning” to indicate the items to which we are referring, as in “what I meant when I said X was the set Y.”

### **The Problem of Ultimate Meaning**

It is sufficient to say that the ultimate meaning of an element of an argument is what it contributes to what the argument generates. But this is not enough; it is not necessary; that is, we need more to be able to weed out nonsense.

(87) We can define concepts in one of two ways. We can recursively consider the constituents of the concepts. With each recursion, the constituents become more abstract. This is Kant's approach. Alternatively, we can consider to what the concepts refer and to what end they serve. The advantage of the latter approach is that it can use concrete or at least pedestrian items.

Kant's approach seems hierarchical, supported at the bottom with, as Peirce describes it, "absolutely simple conceptions such as Being, Quality, Relation, Agency, Freedom, etc., which were regarded as absolutely incapable of definition and of being in the highest degree luminous and clear." (I presume that for Kant the ethical equivalent of the absolutely simple conceptions was his categorical imperative.) This is contrasted with Peirce's approach which defines concepts by the things to which they refer, by their "relations."

## 6.2 Peirce: Lecture Six

(221) I.

Perceptual judgments involve a generality. Even expository judgments<sup>25</sup> involve a generality. For example, the expository judgment "Tully is Cicero" involves the generality of identity.

A singular interacts with the mind in forming a perceptual judgment that makes use of a generality.

That is, the mind understands a singular based on the singular conforming to some generality. If there is no generality available, then the singular has no meaning.

(222) In a proposition, we can refer to a subset of singulars by using the word "some" for the subject, as in "Some calf has five legs" or by using the word "any," as in "Any salamander could live in fire." If the subject uses neither of these words, then the subject refers to a particular singular. ("All" refers to a generality.)

(278) (footnote 2) But every perceptual judgment refers to single objects. Perceptual judgments are understood because they refer to single objects with which we are already familiar. When we read the remark "a flying-machine, however successful, could be of no advantage to commerce," we understand its meaning by relying upon our familiarity with the concepts of (1) objects that fly, (2) machines, and (3) commerce, independent of whether a flying-machine exists or could exist, and independent of whether we can articulate what constitutes a machine and what commerce is.

(223) A particular proposition asserts existence and has a subject of the form "any \_\_\_ some \_\_\_" The following is an example of a particular proposition: "Any catholic [sic] there may be adores some woman or other." A universal proposition asserts non-existence and is of the form "some \_\_\_ any \_\_\_." The following is an example of a universal proposition: "There is some

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25. An expository judgment does not involve perception.

woman whom any catholic adores.”<sup>26</sup> (The universal proposition “asserts non-existence” by asserting, to use the example, that there does not exist a Catholic who does not adore some woman.) Perceptual judgments can only assert existence because perceptual judgments are developed in reaction to the world (and they are outside the control of consciousness). Perceptual judgments have the capacity to reveal facts but they do not do so necessarily. If I perceive (by perceptual judgment) that event A precedes event C because (1) event A precedes event B and (2) event B precedes event C, then from this I can infer a universal proposition, labeled “transitivity,” namely “If A precedes B, and B precedes C, then A precedes C.”

(224) “Thirdness pours in upon us through every avenue of sense.”

Yes, but note that those “avenues” pass through our subconscious on their way to “us.” Otherwise, what would arrive would be meaningless.

## II.

“Goodness” is a measure of focus on an end. This is utilitarianism. The “vulgar” utilitarians use short-term ends, not long-term. What is the end (or purpose) of reasoning? It is not, as the Germans suggest, to satisfy an esthetic sense, i.e., to satisfy ourselves that we are logical. That would be to confine our view to Firstness.

(225) If we confine our view to Secondness, then we consider reasoning to be an uncontrollable reaction to the world. But thinking is Thirdness. We can learn to improve our ability, moving from unfocused reasoning (which is bad) to focused reasoning (which is good). There are three types of reasoning: deduction, induction, and abduction. Of the three, deduction alone is necessary. That is, given the premises, the conclusion must follow. The validity of the argument is independent of the truth of the premises. Deduction is “diagrammatic,” meaning that when we think deductively we construct a model via abstractions which we refine, augment, and combine in an artful way to ferret out conclusions from the abstractions.

(226) For example, if we say that “A is a bay horse, Therefore A is a horse,” we believe this to be true because it remains true under any circumstances we consider, such as the size of the horse, its age, its health, and so on. This is a perception.

(227) Meaning is what can be deduced, so the meaning of a set of premises is the set of possible conclusions. Note that if deduction is done properly, we affirm the truth of the conclusions to the same extent that we affirm the truth of the premises. J.S. Mill’s inductive support for logic is now passé because it uses an antiquated notion of induction.

(228) Induction is a way to test a theory via investigation that asks a question of nature. A negative answer shows the theory to be in error. An affirmative answer can provide support for the theory. We cannot use probability here because probability is the ratio of the number of particular occurrences over time to the number of possible occurrences, and in general we do not know the number of possible occurrences. For example, it is reasonable to ask the probability of an object being red if we know the possible colors for the object, but it is not reasonable to ask the probability of a color being red, because we do not know the number of

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26. Namely Mary, I presume, else why the focus on Catholics?

colors. Laplace, Quetelet, Edgeworth lapse into nonsense here. Poincare, on the other hand, sensibly suggested that all theories are wrong to some degree.

(229) Induction presumes that with each additional test that we apply, we learn more. There is no end to the tests we can apply. The effect is similar to trying to determine the rule that generates a bit string by observing each bit as it is generated. The more bits we have, the greater our opportunity for inferring the rule.

The analogy of the bit string enables articulation of the problem. In this analogy we have a machine into which we can insert a function. Whenever we turn on the machine, it generates bits and continues to do so until we turn the machine off. The function determines the sequence of bits. If we do not change the function, then each time we turn on the machine, the sequence of bits that is generated is the same. We do not have access to the function itself, but only to its output. Our task is to infer the function itself, given only the output.

Because we can only consider a finite number of bits, the best we can do is construct a function that would generate all of the bits seen thus far. The longer the string available to us, the more reliable we believe our rule to be. If the rule is able to predict subsequent bits, our confidence increases. But because we do not have access to the function itself, we have no assurance, no matter how long the string that has been generated, that the next bit that the machine will generate, after all the ones we have seen, will accord with our prediction.

Induction presumes that there is regularity (in the form of a law) that describes the generation of the bit string.

Is there a law if the function generates a random bit string? Of course. But how could we tell what the law is and whether the bit string is random?

(230) Abduction creates hypotheses to be tested by induction. Abduction is the only way we can understand anything. All of science has been built by abduction.

Deduction "provides that something *must* be." It "merely evolves the necessary consequences of a pure hypothesis." Induction "shows that something *actually* is operative." Abduction "merely suggests that something *may* be." It is the "process of forming an explanatory hypothesis." It is "the only logical operation that introduces a new idea" (emphasis in this paragraph is in the original).

Science has progressed too rapidly for chance to be the engine of abduction. There are trillions of possible hypothesis, including the alignment of the planets, or words spoken by the dowager empress of China, or the action of an invisible Jinni.

(231) Psychologists are unable to explain the rate of progress of science, and there has not been enough time for it to be attributable to evolution. Man seems to have an "Insight" into the Thirdness of Nature, into its "general elements." This Insight is similar to instinct in that it gives Man the appearance of knowing more than we do. This Insight is more often incorrect than correct but it is correct enough of the time to produce the results we have seen. This Insight originates outside consciousness, the way perceptual judgments do. We reveal our use of it when we justify the pursuit of a theory on the grounds that the theory is "reasonable."

Another explanation is that every world view is self-supporting. The support or justification for each world view is generated by standards established by the world view itself. We in the Occident point to the advances of science to support our claim that we are the latest (i.e., most advanced) step in evolution. Note that evolution is one of the elements of our world view. We think that technological advance is incontrovertible evidence of the supremacy of our world view. But I am not convinced that other societies could not be just as convinced that their world view is best, even in light of a full understanding of ours. They could point to the unsustainability of our way of life, for example, to pollution and to prisons.

### III.

The following is the “maxim of Pragmatism:” “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.”

That is, the cash value of a concept is its possible effects.

Meaning is connected with purpose. Traditionally, “meaning” has been used to refer to the conclusions of an argument.

(232) Kant was confused in thinking that meaning is the set of conclusions of an argument. This approach presumes that meaning can be traced back to fundamental concepts such as “Being,” and “Quality.” An alternative approach is based on how one item is related to another.

(233) Kant was also incorrect in thinking that all deduction was Barbara. This confines the conclusions to a small number. But Legendre and Gauss showed that an unbounded number of theorems can be generated from a small number of premises.

(234) The meaning of a term or proposition is everything that it can contribute to a conclusion. The meaning an argument is all of the possible conclusions. In both cases, the resulting set has further meaning. So what is the end to which those sets arrive?

### IV.

A “term” is a common noun, which did not exist in primitive languages, such as old Egyptian and Arabic.

(235) A “rhema” is a term plus a verb and a subject, but it includes parameters: that is, a rhema is a proposition with parameters. For example, “Every man loves nature” is a proposition and “Every man loves \_\_\_” is a rhema. A rhema with one parameter is a monad, with two parameters a dyad, and a proposition is a medad.

A term always contains an index, which is a “reacting singular” (hence a Secondness), such as “Theodore Roosevelt.” We react to such singulars by abductively gathering our knowledge of Mr. Roosevelt, which forms a Thirdness.

(236) In the same way that we form a conception of Mr. Roosevelt or any other individual, we form conceptions in general, based on a collection of singulars (perceptual experiences). For

example, one's concept of "dog" is based on perceptual experiences. A concept is a class, and that class is itself an individual.

(237) The concept of "dog" is formed by perceptual judgments that have been connected via abduction and been supported via induction. A concept includes laws, which for dogs would include habits such as their frequency of napping. Nominalists, on the other hand, argue that our minds are of a different nature than the world around us. But they are like a man who is color-blind to red, say, attempting to convince someone with no color-blindness that the latter does not see red either.

Pragmatism is based on three truths:

(238) (a) our conceptions are based on perceptual judgments; (b) perceptual judgments contain generality, implying that we perceive Thirdness; and (c) abduction is similar to perception. Perceptual judgments serve cognition by populating propositions.

The process (beyond conscious control) by which perceptions generate perceptual judgments is abductive. Pragmatism appears to be a similar abductive process, based on concepts. Thus the logic of abduction is the basis of pragmatism.

(239) Comte argued that the only hypotheses that should be considered are those that are verifiable, which must mean verifiable by induction because that is the only possible way to verify an hypothesis. This implies that a conception is a candidate member of a proposition if and only if its consequences are perceptual. Otherwise the conception is not amenable to induction. This is the essence of pragmatism.

Peirce takes Comte to task elsewhere (Lecture VII, page 250 (page 58 herein)).

I think Popper's argument is clearer: only falsifiable hypotheses are of value.

## 7 Lecture Seven: “Three Cotary<sup>27</sup> Propositions of Pragmatism”

In this lecture, Lecture Seven, Peirce argues that pragmatism uses abduction. The process by which perceptual judgments are generated is also abductive.

### 7.1 Turrisi: Commentary On Lecture Seven

(89) An eighth lecture was announced, on “Multitude and Continuity,” but we have little more than the introductory remarks of that lecture.

#### (90) Psychological versus Logical Determinations of the Ultimate End of Reasoning

The purpose of reasoning is to find out something we do not know, based on something that we do. In 1877 Peirce thought that reasoning—what Peirce called “Inquiry”—was motivated by psychology. That is, we find ourselves irritated by doubt, so we change our beliefs until the doubt dissolves. However, by 1903, when he delivered these lectures, Peirce had changed his mind: he then thought that Inquiry was motivated by logic, by the question, Is this belief that I have true or false? A logical motivation suggests a logical criterion to resolution.

(91) Kant argued that Inquiry is resolved by opinions—more firmly held opinions, but opinions just the same. These more firmly held opinions are supported by even more firmly held opinions. In 1877 Peirce suggested that there were three ways to reach resolution: (1) accept the first available hypothesis; (2) accept what culture or those in authority preach; or (3) accept the hypothesis that seems the best. By 1903 Peirce noted that these approaches are limited by the initial set of hypotheses. So we need to understand how hypotheses are generated.

#### (92) The Cotary Propositions of Pragmatism

Peirce’s three “cotary” propositions describe aspects of the mind. (This is the same set that Peirce presented at the end of Lecture Six (Lecture VI, page 238 (page 52 herein))).

(93) 1: Everything in our minds is based on something generated by our senses.

2: Perceptual judgments include generality, which enables us to generate general statements based on them. 3: The subconscious uses abduction to generate perceptual judgments; the conscious mind does not criticize those perceptual judgments.

I believe that the reason that Peirce says that the conscious mind does not criticize the perceptual judgments generated by the subconscious is that those perceptual judgments represent reality to the conscious mind. They are the foundation. However, as plastic as the mind appears, I believe it is possible to question and deny those perceptual judgments, even to insist upon a different reality, but this enters the realm of psychopathology.

We experience the world based on context. Without context we would be unable to experience the world. Visual illusions demonstrate the presence of a context that provides meaning: for example, we interpret Peirce’s serpentine line, a drawing of which is included in the text, as a

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27. Elsewhere Peirce provides an explanation of this term (Lecture VII, page 241 (page 54 herein)).

stone wall, and, after repeated exposures, as just as serpentine line possibly, but never as a book or a chair, say. It is difficult for the conscious mind to influence the selection of a context.

Peirce's position is Kantian, namely that we understand the world based on the "glasses" we wear. The opposing position is Locke's, that we understand the world by removing our glasses because those glasses represent prejudice, bias, ethnocentricity, and so on. Though there is truth in both positions, as usual, I think that Kant's position is the more correct one and Locke's describes only the possibility of correction in our glasses.

(94) We can influence the subconscious and we can, with exposure, refine our discrimination, as, for example, a chili taster can educate his palette. But our perceptual judgments are based on the reality outside of us and thus not entirely subject to our control.

Perception and abduction are both inferences in that they find out something we do not know, based on something that we do. They both explain something by generating perceptual judgments and hypotheses, respectively.

Perceptual judgments are the basis for abduction. An abduction, like a perceptual judgment, is an explanation. However, the explanation is already in the premises.

(95) An abduction is unlike a perceptual judgment in that it can be questioned and denied.

### **Proof as Enumeration**

The latter part of Peirce's lecture is an example of Peirce's method. Peirce's proof, which he develops pragmatically, is philosophical.

(96) Descartes worked by reduction (recursively divide a problem until each sub-problem can be solved, then aggregate the solutions) or by approximation (start with a guess, then refine it). Calculus bridges continuity (i.e., continuous functions) and discontinuity (i.e., rectangular areas between the X-axis and the graph of a continuous function).

(97) However, when people use pragmatism, they include in the purpose of a concept all of the ends or purposes to which the concept can contribute. (This is what Turrisi means by "enumeration.") We generate that set of ends or purposes by abduction.

Abduction generates hypotheses; deduction makes predictions; induction tests the predictions. This process "approximates" experience and it is an "explanation" of experience: it is close to the way that we get an increasingly better handle on life.

## **7.2 Peirce: Lecture Seven**

(241) I.

The three "truths" mentioned at the end of Lecture Six are the "cotary" propositions of pragmatism. The word "cotary" is a neologism from the Latin for "whetstone:" the propositions sharpen, so to speak, the concept of pragmatism.

1: Everything in our minds is based on something generated by our senses. 2: Perceptual

judgments include generality, which enables us to produce general statements based on those judgments.

(242) 3: The subconscious uses abduction to produce perceptual judgments; the conscious mind does not criticize those perceptual judgments.

If we think of perceptual judgments as abductions, which are based on premises, then we are led to search for the premises of perceptual judgments, and, in turn, for the premises of those premises. There is no logical end to this reduction and thus it does not explain perceptual judgments. The fault lies in the assumption that there are discrete premises. Just as Achilles overcomes the tortoise not by a series of discontinuous steps but rather as one continuous movement, so perceptual judgments proceed in "one continuous process."

Abduction comes to us in a "flash," like an "insight." The pieces were there in our minds before; what is new is their connection.

Thus abduction is, at root, a connection, a relationship.

## II.

Included in the text is a drawing, consisting of a single, serpentine line, that looks like a stone wall. This drawing will help in understanding the second proposition.

(243) The line can be classified (i.e., viewed) as either a line or as a stone wall. Our perception can move from one classification to the other, and then back again, which we observe as a change in the drawing itself somehow, as though it (not our perception of it) jumped from being a line to a stone wall, and then back again. But after a time, the illusion can dissipate: we somehow see the line as both a line and as a stone wall. However, note that the classification is embedded in the perception. The classification is an interpretation.

With some visual illusions we can consciously change the perception. We can say, "Now I am going to look at this drawing not as a stone wall but only as a serpentine line," and then, with mental effort, we can do so. (Sometimes it requires visually occluding parts of the scene.) When we do this we usually laugh. We feel giddy, I believe, because we feel a super-human power, that by mere force of will we are able to change reality. That is, we are under the illusion that we are changing what is out there. This is evidence of how closely bound are perceptual judgment and interpretation.

Can we see the line, after a time, as both a line and as a stone wall because we have formed a new perception? This suggests to me that the conscious mind can influence the formation of perceptions by the subconscious mind.

I think Peirce would have enjoyed showing M. E. Escher's art at this point in his lecture.

(244) Other areas of perception reveal the same structure. For example, we can activate a subconscious alarm clock to wake us; if we are accustomed to some regular sound, such as the striking of a clock, then we can become aware of the absence of the sound even while we are unaware of its presence; proof-readers depend for their employment upon their ability to see letters as opposed to meaning; we can remember the meaning of a conversation even if we do

not remember the words; politicians can suggest words without saying them.

This establishes the third cotary proposition. In order for the abduction implied by perceptual judgments to be possible, perceptual judgments must contain generality. And this establishes the second cotary proposition.

The process the conscious mind uses—abductive judgment—and the process the subconscious mind uses—perceptual judgment—are different only in that the results of the latter are unquestioned. For example, we find it hard to believe that anyone can perceive an object as red, and then subsequently decide it is not red...

...except if there be some explanation, such as the light was bad or there was a strange shadow. The unquestioned nature of the process of perceptual judgments is the source of the surprise and giddiness behind visual illusions, I believe.

(280) (footnote 2) Turrisi notes that Kuhn's description of "paradigm shifts" implies that a theory could be thought of as similar to a perceptual judgment in that we believe the results of the judgment so firmly and with so little awareness of the judgment that we believe we are seeing reality as it really is. Similarly, once a theory is established, we have to apply mental energy to break out of its mold and see the world from a different perspective. Experiments in perception suggest that we are able to perceive more easily when what is presented to us is in line with what we expect. If what is presented is anomalous, our perceptual performance is impaired.

(245) The unquestioned nature of perceptual judgment is the "test of inconceivability": if it appears to us inconceivable that a concept could be questioned, then the concept is the result of perceptual judgment; otherwise, it is the result of abductive judgment.

Note that it is only the appearance of inconceivability that is important. Specifically, it is not important that the concept not be capable of being controverted. The visual illusions that Peirce describes earlier in this lecture show that a perceptual judgment can be unquestioned initially and yet be controverted.

Abduction (also known as "adopting an explanatory hypothesis") is an inference. It has a logical form:

"The surprising fact, C, is observed;  
"But if A were true, C would be a matter of course.  
"Hence, there is reason to suspect that A is true."

(246) Note that the conclusion—"A is true"—is in one of the premises—"But if A were true..."

There are three objections to the argument that all conceptions are based in perception. First, conceptions might arise outside of logic. Second, how could every hypothesis, even fanciful ones, be rooted in perceptual judgments? And third, the conclusion is in the premises in the form of abduction, as shown above, but "common knowledge" suggests that there is some other origin for some hypotheses.

The first objection is an objection about logic, not about perceptual judgments.

In response to the first objection, suppose that some part of an argument's conclusion is unconnected with any of the premises of the argument. This unconnected part arrives as a perceptual judgment and its inclusion in the argument is an inference we make consciously.

This is a confusing rebuttal. The objection is that conceptions could arise in some non-logical way. But Peirce does not argue that all conceptions are logical, only that all conceptions are based on perceptual judgments. One possibility is that the general field of logic, as we know it today, might not be "complete" in the sense that it does not yet have sub-disciplines that collectively cover all of the territory.

(247) In response to the second objection, deduction is able to derive conclusions from premises, and this objection is due to ignorance of the "logic of relations."

This rebuttal seems to miss the point. Why does Peirce think that all hypotheses are based on experience?

In response to the third objection, inference is a conscious activity consisting of a series of steps, of which there must be a first step, which must be based on something outside of consciousness. This activity is finally a winnowing process, not a generative one.

I think what Peirce intends here is that inference only removes possibilities. Of all the conclusions that we could draw from a given set of premises, inference winnows out some of the false conclusions; it does not generate new ones. Thus common knowledge here is wrong.

(248) Continuing with the rebuttal of the third objection, when we first encounter the concept of an inference, for example, such as deduction, we encounter it as a type of inference. If the concept of "inference" means nothing to us, then we must understand how mental objects can be related. If that, in turn, means nothing to us, then we must understand the "world of ideas." The point is that we must already have in mind a type within which we can consider deduction in order to understand deduction. The context for that type is based finally on perceptual judgment.

Inference, otherness, and character are "obviously" forms of Firstness, Secondness, and Thirdness.

### III.

Even if we ignore the cotary propositions, we will still define pragmatism the same way. There are three fundamental ways of reasoning: deduction, induction, and abduction. Induction is intended to be a process of testing hypotheses, or, less formally, testing expectations.

(282) (footnote 4) Analogy is not a fourth fundamental way of reasoning but rather a combination of the other three.

Peirce does not explain what the combination is.

Pragmatism is "nothing else than the logic of abduction." For example, suppose we are in the midst of our work, considering a number of facts but not able to see any general principles.

However, it suddenly comes to us that if a certain principle were true, then it would explain these facts. This process is abduction. Mendeleev's development of the Periodic Table is an example of abduction. He sought the general principle that would explain the facts of inorganic chemistry. He noticed that if atomic weights were the general principle, then it would explain the facts.

(283) The purpose of induction is to generate theories which, by deduction, can develop expectations that can be tested by induction. This agrees with Comte's argument that theories must be verifiable, meaning tested against experience.

(284) Unfortunately Comte seemed to confine himself to Secondness, which confines him to hypotheses about physical things, as opposed to mental attitudes, for example. However, Comte, along with his French countrymen, endorsed certain non-physical theories on the basis of their "wholesomeness" for society.

Logic presumes a distinction between truth and falsehood, that those concepts apply independent of our being, and that we seek to align our notions of truth and falsehood of a given item based on the item's actual truth and falsehood. This alignment is to the representation of the item, hence Thirdness. But the color red is not a representation; it is simply red, a Firstness. And taking action—a Secondness—is independent of the other two. The three categories are necessary for an understanding of abduction.

I do not agree with the conclusion that the three categories are necessary for an understanding of abduction. Granted, if we knew how the subconscious performed its work, then we believe we would be better able to understand abduction, but understanding abduction could be achieved independently from understanding how the subconscious performs its work.

(249) Pragmatism provides a way to judge hypotheses. If two conceptions lead to the same practical conduct—what we can expect if the conceptions are true—then the conceptions are identical. Pragmatism neither includes bad hypotheses nor excludes good ones: it exactly characterizes the set of good abductions. Pragmatism cannot impinge upon induction, though it can reduce some deductive premises, but these premises would lead to conclusions that we would not want to consider anyway.

(250) IV.

"...pragmatism is the doctrine that every conception is a conception of conceivable practical effects."

"Any hypothesis, therefore, may be admissible, in the absence of any special reasons to the contrary, provided it be capable of experimental verification and only in so far as it is capable of such verification. This is approximately the doctrine of pragmatism."

Pragmatism serves abduction, and abduction serves the end of producing hypotheses that can be verified by experiment. There are five opinions about what experimental verification means.

The first opinion, espoused by Auguste Comte, is that experimental verification is confined to direct perception: we are to believe "only what we actually see." But this opinion rules out itself

because it is an hypothesis that itself cannot be subject to direct perception.

(251-2) The second opinion is that experiment can support theories but not verify them because the latter implies an endless number of trials.

The third opinion concerns “infinite multitudes.”

It is not clear what this third opinion is nor what Peirce’s response is to it. Peirce considered the “lowest grade” of “infinite multitude” to be “the multitude of all integer numbers,” i.e., the first transfinite number,  $\aleph_0$ . This third opinion has some basis in mathematics.

(253) The fourth opinion is attributable to mathematicians and involves the existence of infinitesimals—positive numbers that are smaller than any positive real number.

Peirce argues that the points in a line are “discrete and separate,” and that “there can be no merging of one into another.” Unfortunately, any line segment has the same cardinality as the set of real numbers. So it is unclear what Peirce is talking about here and what his point is.

The fifth opinion is that we perceive continuity. For example, we perceive time to flow without interruption, as opposed to a sequence of instants.

How is this opinion an opinion about experimental verification?

(254) V.

Pragmatism should serve to get rid of vague ideas and make clear ideas that are difficult to understand. Thirty years ago, it was presumed that the only way ideas could be defined was by recursively defining their constituting ideas. This regression was presumed to stop with fundamental ideas such as “Pure Being, Agency, Substance,” and so on. But in fact this process is endless. The logic of relations has shown this view to be in error. Defining ideas in terms of pedestrian experiences was considered so novel as to be “utterly incomprehensible.” An example of this latter way of defining ideas is the definition of energy: we know what energy does, which we have learned by experience, but nothing about what it is. The second task of pragmatism—making clear ideas that are difficult to understand—is of higher relative importance today.

(255) There are three attitudes about Thirdness. First, Thirdness cannot be verified experimentally and thus cannot be used to support theories. But this implies that there are no laws in nature. Second, Thirdness can be verified experimentally but not perceived. But this implies that perception does not report reality and that finally we are constrained to the present. If we ask questions, we assume that there is truth and that we cannot influence it because it is independent of us. Third, Thirdness can be perceived, thereby implying the three cotary propositions.

All three attitudes question the inclusiveness of perceptual judgments as “antecedents of all conditional judgments.” These objections could be answered by assuming that there is some antecedent that is not a perceptual judgment and then asking how this antecedent is generated? It could be by logic of which we are not yet aware. But it could not be by conscious activity

because conscious activity is a series of steps, always with a first step.

(256) Consciousness uses perceptual judgments in order to precipitate action that is directed to some end. It is not reasonable to base conscious activity on something other than perceptual judgment, just as it is not reasonable to perform conscious activity for some purpose other than action directed to some end.

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## Appendix A Biography

from the Dictionary of Philosophy (<http://www.ditext.com/runes>)

Peirce, Charles Sanders: American Philosopher. Born in Cambridge, Mass, on September 10th, 1839. Harvard M.A. in 1862 and Sc. B. in 1863.

Except for a brief career as lecturer in philosophy at Harvard, 1864-65 and 1869-70 and in logic at Johns Hopkins, 1879-84, he did no formal teaching. Longest tenure was with the United States Coast and Geodetic Survey for thirty years beginning in 1861. Died at Milford, Pa. in 1914

He had completed only one work, *The Grand Logic*, published posthumously (*Coll. Papers*). Edited *Studies in Logic* (1883). No volumes published during his lifetime but author of many lectures, essays and reviews in periodicals, particularly in the *Popular Science Monthly*, 1877-78, and in *The Monist*, 1891-93, some of which have been reprinted in *Chance, Love and Logic* (1923), edited by Morris R. Cohen, and together with the best of his other work both published and unpublished, in *Collected Papers of Charles Sanders Peirce* (1931-35), edited by Charles Hartshorne and Paul Weiss.

He was most influenced by Kant, whom he thought, raised all the relevant philosophical problems but from whom he differed on almost every solution. He was excited by Darwin, whose doctrine of evolution coincided with his own thought, and disciplined by laboratory experience in the physical sciences which inspired his search for rigor and demonstration throughout his work. Felt himself deeply opposed to Descartes, whom he accused of being responsible for the modern form of the nominalistic error. Favorably inclined toward Duns Scotus, from whom he derived his realism. [Peirce argued that] Philosophy is a subclass of the science of discovery, in turn a branch of theoretical science. The function of philosophy is to explain and hence show unity in the variety of the universe. All philosophy takes its start in logic, or the relations of signs to their objects, and phenomenology, or the brute experience of the objective actual world. The conclusions from these two studies meet in the three basic metaphysical categories: quality, reaction, and representation. Quality is firstness or spontaneity; reaction is secondness or actuality; and representation is thirdness or possibility. Realism (q.v.) is explicit in the distinction of the modes of being actuality as the field of reactions, possibility as the field of quality (or values) and representation (or relations). He [Peirce] was much concerned to establish the realism of scientific method: that the postulates, implications and conclusions of science are the results of inquiry yet presupposed by it. He was responsible for pragmatism as a method of philosophy that the sum of the practical consequences which result by necessity from the truth of an intellectual conception constitutes the entire meaning of that conception. Author of the ethical principle that the limited duration of all finite things logically demands the identification of one's interests with

those of an unlimited community of persons and things. In his cosmology the flux of actuality left to itself develops those systematic characteristics which are usually associated with the realm of possibility. There is a logical continuity to chance events which through indefinite repetition beget[s] order, as illustrated in the tendency of all things to acquire habits. The desire of all things to come together in this certain order renders love a kind of evolutionary force. Exerted a strong influence both on the American pragmatist, William James (1842-1910), the instrumentalist, John Dewey (1859-), as well as on the idealist, Josiah Royce (1855-1916), and many others. -- J.K.F.

## Appendix B Glossary

Note: Glossary entries that appear to be coined by Peirce I note by the phrase “(Peircean term);” terms that Peirce uses and defines and which appear not to be coined by Peirce I note by the phrase “(Peircean usage);” all other entries are, I presume, in general usage.

Barbara

A form of syllogism in which the two premises and the conclusion are all of the form “Every  $\alpha$  is a  $\beta$ .” That particular form was given the name A in the Middle Ages (four other forms were given the names I, E, and O). The vowels in “Barbara” indicate the form of the three parts of the syllogism. Other syllogistic forms include Celarent, Darii, and Ferio. (I suppose Barbara could be equivalently known as Bandana, for example, or Banana or even Savanna.) ([8], Volume 23, page 262)

Categorical Imperative

“Ethical judgments are essentially based on faith in necessary moral law, which is expressed in two forms of the categorical imperative, ‘Act as if the maxim from which you act were to become through your will a universal law of nature’ and ‘So act as to treat humanity, whether in your own person or that of another, in every case as an end in itself, never as a means’” ([5], “Kant” entry). (The Columbia notes that “In [Kant’s] tradition can be put scientific agnosticism and the pragmatism of James and Dewey” ([5], “Kant” entry).)

Expository judgment (cf. Perceptual judgment)

One meaning of an “exposition” is a “discourse or an example of it designed to convey information or explain what is difficult to understand” [15]. The example of an expository judgment that Peirce gives is, “Tully is Cicero” (Lecture VI, page 221 (page 48 herein)).

Generality (cf. Singularity, Nominalism, Realism)

The concept of a class. That is, the concept of a common element shared by a set of objects. There are only individuals (“singularities”) out there, outside of us in the world. However, in our minds we perceive generalities. Whenever we use the indefinite article in speech, as in “a chair,” we are using a generality.

Hedonism

“The doctrine that pleasure or happiness is the sole or chief good in life” [15].

“The doctrine that pleasure is the highest good. Ancient hedonism expressed itself in two ways: the cruder form was that proposed by Aristippus and the early Cyreniacs, who believed that pleasure was achieved by the complete gratification of all one’s sensual desires; on the other hand, Democritus and Epicurus, though accepting the primacy of pleasure, taught that it could best be attained through the rational control of one’s desires....While ancient hedonism was egoistic, the modern hedonism of the British philosophers is universalistic in that it is conceived in a social sense—‘the greatest happiness for the greatest number.’ Its modern expression is in utilitarianism” [5].

Peirce considered hedonism to be a philosophy “which no man in his sense and not blinded by theory or something worse can admit” (Lecture IV, page 197 (page 38 herein)).

#### Logica docens

logic theory, logic as a systematic doctrine, or formal reasoning.

#### Logica utens

applied logic; logic as used in thought in general, or habits of reasoning.

#### Logic of relations (Peircean usage)

The purpose of logic is, in Turrisi’s words, to “analyze and display logical relations rather than calculate arguments” (page 99, note 7). DeMorgan argued that the symbols and operations were all that mattered in an algebra, not the items to which the symbols refer. The symbols were “empty of actual referents” (Lecture II, footnote 7, page 259). Firstness, Secondness, and Thirdness are defined via the logic of relations. Boolean algebra appears to be an instance of the logic of relations.

One use of the “Logic of Relations” (Lecture VI, page 221 (page 48 herein)) that Peirce demonstrates is the “general relation of identity of Tully and Cicero” that is expressed in the expository judgment “Tully is Cicero.”

#### Normative

Of, relating to, or prescribing [i.e., to lay down a rule, dictate] norms [i.e., a principle of right action binding upon the members of a group and serving to guide, control, or regulate proper and acceptable behavior] [15].

#### Noumena

“The ground of phenomena that is unknowable by the senses but is conceivable by reason” [15].

#### Nominalism (cf. realism)

“1: a theory that there are no universal essences in reality and that the mind can frame no single concept or image corresponding to any universal or general term. 2: the theory that only individuals and no abstract entities (as essences, classes, or propositions) exist” [15].

“A theory of the relation between universals and particulars...contrasted with realism. The problem arises because in order to perceive a particular object as a particular thing, say a table, we must have a prior notion of table. Then does this prior notion have an independent existence? Nominalism says that it does not, that it is just a name for a group. Nominalism is appropriate to materialism and empirical philosophy and hence has been popular in modern thought” [5].

“...general concepts have no existence at all, they are but generalizations of individuals” ([5], “realism” entry, in defining nominalism).

“Peirce’s use of ‘nominalism’ requires some explanation. Nominalism is more normally associated with the medieval discussion on the existence of universals. The nominalist position in this debate sought to explain universals in terms of properties of the words or *names* used (hence ‘nominalism’ from *nominalis* or belonging to a name) rather than as separately existing forms. Peirce, however, uses ‘nominalism’ to refer to any theory that does not take the real separate existence of laws, generalities, possibilities, etc. seriously” [1].

“Most, if not all [of] you, are, I doubt not, Nominalists; and I beg you will not take offense at a truth which is just as plain and undeniable to me as is the truth that children do not understand human life. To be a nominalist consists in the undeveloped state in one’s mind of the apprehension of Thirdness as Thirdness. The remedy for it consists in allowing ideas of human life to play a greater part in one’s philosophy” (Lecture V, page 208 (page 43 herein)).

“Yet this is what the nominalistic reasoner is continually doing. He would persuade us that the mind,—that to say our opinions,—are filled with notions wholly unlike anything in the real world. Now the real world is the world of percepts, concerning which perceptual judgments are our only witnesses” (Lecture VI, page 237 (page 52 herein)) (the unusual punctuation is in the original).

Normative sciences (Peircean usage) (see Normative)

A trio consisting of esthetics, ethics, and logic that is built on top of mathematics and supports metaphysics.

Perception (Peircean usage)

“...perception being for the logician simply what experience is, that is, the succession of what happens to him, forces him to admit immediately and without any reason” (Lecture VI, page 238 (page 52 herein)).

Perceptual judgment (cf. Expository judgment) (Peircean usage)

A conclusion, provided by the subconscious, that arises from experience.

“For reaction is existence and the perceptual judgment is the cognitive product of a reaction” (Lecture VI, page 223 (page 48 herein)).

“All that I can mean by a perceptual judgment is a judgment absolutely forced upon my acceptance and that by a process which I am utterly unable to control and consequently am unable to criticize” (page 223, VI).

“Now the real world is the world of percepts, concerning which perceptual judgments are our only witnesses” (Lecture VI, page 223 (page 48 herein)).

Phenomena

“a: an object or aspect known through the senses rather than by thought or intuition; b: an object of experience in space and time as distinguished from a thing-in-itself; c: a fact or event of scientific interest susceptible of scientific description and explanation” [15].

"[Kant] asserted that things of our experience, called phenomena, may be known, but that the mind could never practically know things-in-themselves, or noumena, which cannot be sensuously perceived" ([5], "Kant" entry).

### Phenomenology

"1: the philosophical study of the progressive development of mind. 2: the description of the formal structure of phenomena in abstraction from interpretation or evaluation, esp. as a foundation for the sciences" [15].

### Pragmatic

"*adj* 1 *archaic* a (1): BUSY (2): OFFICIOUS b: OPINIONATED 2: relating to matters of fact or practical affairs often to the exclusion of intellectual or artistic matters: practical as opposed to idealistic <the problem-solving mentality, the product of science and ~ effort –T. F. O’Dea> <~ men of power have had not time or inclination to deal with ...social morality –K. B. Clark> 3: relating to or being in accordance with philosophical pragmatism" [15].

### Pragmaticism

"The philosophic doctrine of C. S. Peirce" [15].

### Pragmatism

"1: a practical approach to problems and affairs <tried to strike a balance between principles and ~> 2: an American movement in philosophy founded by C. S. Peirce and William James and marked by the doctrines that the meaning of conceptions is to be sought in their practical bearings, that the function of thought is to guide action, and that truth is preeminently to be tested by the practical consequences of belief" [15].

"method of philosophy in which the truth of a proposition is measured by its correspondence with experimental results and by its practical outcome. Thought is considered as simply an instrument for supporting the life aims of the human organism and has no more metaphysical significance than the opposition of thumb and forefinger. Pragmatism stands opposed to doctrines which hold that truth can be reached through deductive reasoning from a priori grounds and insists on the need for inductive investigation and constant empirical verification of hypotheses. It normally holds that ideas, to be considered true, must be verifiable by an impartial observer. There is constant protest against speculation concerning questions which have no application and no verifiable answers. Pragmatism holds that truth is modified as discoveries are made. Truth evolves and is relative to the time and place and purpose of inquiry. In its ethical aspect pragmatism holds that knowledge which contributes to human values is real and that values inhere in the means as vitally as they do in the end itself. The principles of pragmatic theory are generally considered to have been first developed as formal doctrine by C. S. Peirce (1878). He was followed by William James, who introduced the term (1898). James held that in vital matters of faith the criterion for acceptance was the will to believe, a theory reminiscent of the Kantian ethic. John Dewey in his works developed the instrumentalist aspect of the doctrine. In England, F. C. S. Schiller formulated his theory of humanism (human values are the test of truth)" [5].

Atkin [1] distinguishes two forms of Peircean pragmatism, what Atkin calls an “early” form (circa 1878) and a “later” form (circa 1903, i.e., at the time of the lectures that are the subject of this report). The early form Atkin describes as follows: “Put in its simplest terms, the pragmatic maxim allows us to see what difference the truth of certain concepts would make to our lives.” The later form of pragmatism is broader. The truth of a concept includes not only what *will* happen but also what *would* or *could* happen. The truth of a concept includes not only real experiences but also “diagrammatic” ones (e.g., mathematically derived conclusions) and even “any flight of imagination provided this imagination ultimately alights upon a possible practical effect.”

## Predicate

“*n* 1 a: something that is affirmed or denied of the subject in a proposition of logic <in ‘the paper is white,’ whiteness is the ~> b: a term designating a property or relation 2: the part of a sentence or clause that expresses what is said of the subject and that usu. consists of a verb with or without objects complements, or adverbial modifiers” [15].

“*vt* 1 a: AFFIRM, DECLARE b archaic: PREACH 2 a: to assert to be a quality, attribute, or property b: to make (a term) the predicate in a proposition 3: to cause to based: FOUND 4: imply” [15].

## Realism (cf. nominalism)

Realists hold that “general concepts [such as “the notion of chair”] have an existence independent of individuals.” “...objectivism [as opposed to subjectivism] is also called realism, because it teaches that there are real objects in existence outside the mind” [5].

## Scholasticism

“Philosophical thought of medieval Western Europe. The term suggests more unity in the thinkers than there was; it is analogous to an expression like ‘Chinese philosophy.’” The entry mentions Augustine’s Neoplatonism and Thomas Aquinas’ separation of philosophy from theology and his notion that reasoned and revelatory truth cannot conflict. Scotism, after Duns Scotus, argued that “what was good was good because God willed it to be good.” Thomists considered this a denial of natural law. William of Occam, from whom we get Occam’s Razor, was a Scotist; he argued a “flat denial of everything Thomistic,” that there is “no rational ground to anything in faith.” The entry notes that in “1879 Pope Leo XIII proclaimed Thomism to be the ‘official’ philosophy of the Church” [5].

## Singularity (cf. Generality)

“That which is not general is singular; and the singular is that which reacts” (page 221, VI).

## Special sciences (Peircean term)

The sciences that build on metaphysics (see “normative sciences”), such as psychology, anthropology, linguistics, history etc., in what Peirce calls the “Psychical wing” or dynamics, physics, chemistry, physiology, anatomy, astronomy, geology, etc., in the “Physical wing”

(Lecture II, page 151 (page 26 herein)). The special sciences, unlike the normative sciences, generate facts.

## Utilitarianism

“1: a doctrine that the useful is the good and that the determining consideration of right conduct should be the usefulness of its consequences; *specif*: a theory that the aim of action is the largest possible balance of pleasure over pain or the greatest happiness of the greatest number 2: utilitarian character, spirit, or quality” [15].

“We have seen that any kind of goodness consists in the adaptation of its subject to its end... If you call this utilitarianism, I shall not be ashamed of the title. For I do not know what other system of philosophy has wrought so much good in the world as that same utilitarianism” (Lecture VI, page 224 (page 49 herein)).

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