

Objective Logic and the General Theory of Categories

These lectures in part are designed to trace the development of Peirce's ideas and then to use them to construct a launch pad. Peirce's metaphysical life may be viewed as a barbell-heavy at both ends, thin in the middle. In fact, I believe that the early period, the period we have reviewed up to now, is the nebula out of which most of the later philosophical ideas arose. Peirce did not have a segmented philosophical life; his real life was segmented, disjointed, ruptured, and this caused a disjoint in his philosophic life. In 1872 he was given responsibility for the pendulum experiments for the U.S. Coast and Geodetic Survey and promoted to Assistant. Instead of seeking to discover a 'theory of the all' he was now making precise measurements of the very specific here and now. He traveled in Europe three times in the 1870s as part of this assignment, and again later. He separated from his wife in 1876, took a position at Johns Hopkins in 1879 and was terminated from it in 1884. That year he was put in charge of the Office of Weight and Measures. But throughout he never lost his metaphysical muse (or curse, depending on one's point of view), for even while he was trying to make precise measurements and measure disturbances that hinder such a goal, he was wondering whether the physical constants were really constant, or whether they were variable and if so by chance or according to some law. What he started as a somewhat sickly Harvard student he could not shake off and would bring him back to contemplate and elaborate from the mid 1880s to the end of his life.

Metaphysical Topics: 1872-1885

1. Thinking as Sign Creation

Before turning to the main topic of this lecture I want to review this interregnum period for ideas relating to the theme of these lectures. During this period Peirce is producing papers on the topic of pragmatism. In the early 1870s he is a member of the Metaphysical Club with William James, John Fisk, Francis Ellingwood Abbot, Chauncey Wright, Oliver Wendell Holmes, and others. Most were lawyers. Peirce claimed to have started the club. In later life he wrote to a former student: "In the sixties I started a little club called the Metaphysical Club. It seldom if ever had more than half a dozen present. Wright was the strongest member and probably I was next. . . . It was there that the name and the doctrine of pragmatism saw the light. There was in particular one paper of mine that was much admired ((Quoted in Kenneth Laine Ketner, *His Glassy Essence: An Autobiography of Charles Sanders Peirce* (Nashville: Vanderbilt University Press, 1998), p. 279.)). . ." Perhaps the practicing lawyers liked Peirce's analysis of meaning in the series of papers that included "How to Make Our Ideas Clear," (1878). They could use that non-dogmatical analysis to show judges what is really at stake in the legal controversies they were hired to win. Peirce, however, was not primarily interested in the context of legal conventions, where the right answer is what the judge says it is. He was looking for a test of metaphysical propositions that would improve upon the method Kant had used-analysis of logical truth. Kant's approach was static and deductive; metaphysical propositions derived whatever legitimacy they could have from their conformity with the *a priori* relations embedded in our fund of knowledge. Peirce's approach is dynamic; everything is in motion. Metaphysical fixity is always provisional; it is always relative, though invariably in some systematic way when regarded from the local view of a given metaphysician. When metaphysicians forget this they produce pompous works even if they had guessed right to begin with. And they make little progress toward a fuller metaphysical understanding because

they cannot link up their insights with the new information science is always generating. It is with this in mind that the following remark from a fragment written in 1872 should be interpreted: "I suppose that the fundamental proposition from which all metaphysics takes its rise is that opinions tend to an ultimate settlement & that a predestinate one." (W3, p. 8) In other words, if metaphysical truth is of a very general nature then it is inconceivable that as long as there are knowers those truths will come to be known. Now if the truths are not in fact true then it is perfectly conceivable they shall be only imperfectly known and then forever forgotten or remembered merely as historical curiosities. Thus, metaphysics as a subject always includes a meta-metaphysical theory about the convergence of opinion about its proper content, viz., that if metaphysics is really possible then the universe and the knower are systematically bound together in some obscure way.

Of course, if metaphysics is language gone on a holiday then it is possible that philosophers will forever go round and round and never shed light on reality. In his discussion on "practical logic" Peirce says that there are two ways to look at the subject; one, from the perspective of final causation, the other, from a perspective of efficient causation. Both involve special series of influences not normally treated or understood by empiricism. In the former case thought "is influenced by a final cause" which is the ultimate opinion that would be held after all investigation has been carried out. Peirce then says: "so the ultimate conclusion is that which determines opinions and does not depend upon them and so is the real object of cognition. This is idealism since it supposes the real to be of the nature of thought." (W3, p. 8) From the other perspective, where causes precede their effects, the ultimate opinion is connected not with this or that mind but with "mind in general." No matter which perspective is adopted, along with it one must adopt the view that generality influences human cognition in ways that human cognition is unaware of at first. Either it serves as a

shadow standard of what is reasonable or rational when hypotheses compete with one another or else it constitutively produces actual thought in a determinate situation. Peirce concludes: "We ought therefore to discard the conception of the real as something actual and to say simply that only thought actually exists and it has a law which no more determines it than it by the mode in which it acts makes the law. Only this law is such that in a sufficient time it will determine thought to any extent." (W3, p. 9) Thought doesn't make the law and the law doesn't make thought. These are one-sided limits of what is in fact a reciprocal and dialectical process.

In one draft of this argument Peirce conceived the extremes as reflected in the debate between nominalists and realist. (W3, p. 29) In another he tries to describe the process whereby particular sensations and feelings acquire generality and referentiality:

For an incomplex feeling to have a meaning, it must in the first place be considered to have a meaning. This involves a great deal. It can have no meaning which it is not considered to have. It must be considered to refer to some definite object; this object must itself be some immediate object of consciousness, some other feeling upon the occasion of which the feeling question arises. It will not be necessary, however, that this occasion should be any actual feeling; it will be sufficient if it is something virtually present in the consciousness just before. Nor will it be necessary that it should be clearly apprehended; it will be sufficient if it is in any degree in the consciousness. Thus, a certain complication of feelings may give rise to a feeling *which is a sign of that particular complication*. Now this complication was not actually felt except by this very feeling, nor perhaps even then very clearly, yet it is sufficient that there is held to be some element in the preexisting state of feeling which the feeling indicates to make this feeling mean that. The feeling must not only refer to some apprehended objects, but there must be some apprehended regularity in its application to objects.

(W3, p. 39; emphasis added) Here is dual consciousness: actual and virtual feelings arise nearly at once, the virtual upon the occasion of the actual. With a "complication" of these a sign arises. We see in this passage a restatement of the "New List" argument. There is something about consciousness that allows it to create 'subsidiary forms' of the objects it apprehends and then at once examines the relation between the two, designates that relation as a sign relation, abstracts elements of similarity between the two feelings, and interprets the relation and similarity as constituting a rule (an "apprehended regularity in its application to objects"). This is certainly a "great deal." This is a statement of Peirce's anti-cartesianism, his opposition to the view of mind as a passive receiver of simple and distinct ideas. To have even a feeling, Peirce is saying, is to have a feeling about the feeling.

If mentality follows a triadic process as a very condition for thinking then in that process there may be a steering mechanism that leads the mind along the proper path to ultimately correct opinions. This it does automatically as long as it is free to roam around without fear of prejudice or institutional constraints. Peirce seems to think that like the Delphic oracle the steering mechanism is an oblique one, perpendicular rather than direct. He makes this remark:

We do believe then in regard to every question which we try to investigate that the observations though they may be as varied and as unlike in themselves as possible, yet have some power of bringing about in our minds a predetermined state of belief. This reminds us of the species of necessity which is known as fate. . . . Fate then is that necessity by which a certain result will surely be brought to pass according to the natural course of events however we may vary the particular circumstances which precede the event.

(W3, pp. 43-44) Peirce found this doctrine to be “strange and paradoxical” (W3, pp. 49, 80) because “we are accustomed very rightly to think that causes always precede their effects and to disbelieve in fate, which is a fancied necessity by which some future event as it were forces the conditions which precede to be such as would bring it about.” (W3, p. 44) Mental action, therefore, appears to be “an extraordinary exception to the ordinary laws of mechanics.” (W3, p. 45)

In yet another draft he uses the term ‘sensation’ for the element introduced into consciousness and ‘mental affection’ as the act of identifying an object of consciousness, and then says “but *affection* is not the whole of investigation. It involves also the production of new beliefs out of old ones according to logical laws.” (W3, p. 48)

In 1872-73 Peirce was working on a book about logic. The remarks above probably are an introduction designed to show the deep and unifying implications of logical truth and of the metaphysical significance of the study of logic, regarded as a symbolic skeleton of mental action frozen in time. Included in the book, as part of later chapters yet to be written, were discussions of the categories and of representations. We can now appreciate that the following remarks (W3, p. 63)

It is therefore an essential property of an idea that it should address itself to the mind at another time.

and

A representation is something which produces another representation of the same object and in this second or interpreting representation the 1st representation is represented as representing a certain object.

were insights that Peirce had carried from the beginning. This was his main course of philosophic discovery. We are not surprised that the drafts contain a section "On Time and Thought." Time appears to serve as a matrix that keeps the effervescence of representational mentality from becoming utterly chaotic. But, Peirce argues, that matrix cannot be a discrete matrix of finite steps between events. If conscious events-sensations, ideas-occur separately in infinitesimal instants then they cannot be compared except through mediating events, and those mediating events require other mediating events needed to establish resemblance or comparison, ad infinitum; and so, "the link which is to bind the first two together which are to be pronounced alike, never being found." (W3, p. 69) But the mind is a comparing machine and from this we must conclude that the flow of time is continuous. Time is not a matrix but a continuum. Does this mean that simultaneity is a direct experience present to the mind in an instant? Peirce does not give this explanation because it is amenable to the objection just described. Instead he suggests that to be present to mind is to be present over an interval of time and not to be present in an instant. Ideas that are present to mind are present only by virtue of the presence of other ideas. Resemblance is possible because the apprehension of objects of consciousness can occur over intervals of time. Apprehension can narrow or broaden the temporal horizon of its object field, regarding some objects as brief whole subjects and then as parts of enduring events; and "during this longer interval they are present to the mind as different." (W3, p. 70) This difference then becomes the basis for an inference of resemblance. To say that an idea is present at an instant is just to say that it is present during an interval without changing.

Is Peirce following Kant here? Is he thinking of the unity of transcendental apprehension? I think these drafts may be just his thinking out loud. And I am interested, in any case, in his working thoughts on this strange and paradoxical subject. In MS 215 he does not want to give up using the

notion of a thought experienced in an instant, i.e., as continuously experienced as the same. Instead of a holistic/continuity theory described above, he suggests the following linear/dynamic theory:

The first thing that is requisite therefore to a logical mind, is that there should be elements of thought which are present at instances in this sense [i.e., the sense in which an idea is present in every part of an interval of time]. The second thing that is requisite is, that what is present one instant should have an effect upon what is present during the lapse of time which follows that instant. This effect can only be a reproduction of a part of what was present at the instant; because what is present at the instant, is present during an interval of time during the whole of which the effect will be present. And therefore since all that is present during this interval is present at each instant, it follows that the effect of what is present at each instant is present at that instant. *So that this effect is a part of the idea of which produces it.* In other words, it is really a reproduction of a part of that idea.

(W3, p. 71; emphasis added) In MS 216 (March, 1873) we get still another variation:

There is besides this a causation running through our consciousness by which the thought of any one moment determines the thought of the next moment no matter how minute these moments may be. And this causation is necessarily of the nature of a reproduction; because if a thought of a certain kind continues for a certain length of time as it must do to come into consciousness the immediate effect produced by this causality must also be present during the whole time, so that it is a part of that thought. Therefore when this thought ceases, that which continues after it by virtue of this action is a part of the thought itself.

(W3, pp. 74-75) We can imagine a thought as a line moving across a page. We may imagine that line as the same line, neither growing nor diminishing, but just moving; or we may that line as diminishing at one end and growing at the other at the same rate. Apparent (unreal) motion is a constant phenomenon on computer screens. Peirce may be saying that we perceive reality the way we perceive a computer screen, but the underlying logic is different. The effect of the line is more line, and more line is what the line was that produced it. Or consider a square patch of red color within a Mark Rothko painting of a red square. The patch is a continuous part of the whole or it is a reproduction of the whole. In the prior example the dynamism is assumed to be occurring outside our minds; the line is really replicating itself like a DNA molecule. In the latter, the painting is undifferentiated-although Rothko liked to play visual tricks on the viewer by creating vague boundaries and edges-and we provide the differentiating framework. Signs, by this analysis, are simply the left overs of prior experiences that continue through time and are captured by the 'attentive' mind. When cognition occurs signs are in existence for "every species of actual cognition is of the nature of a sign." (W3, p. 76)

2. Chance and Continuity

Between 1873 and 1877 Peirce took a holiday from metaphysics, producing works on "a general account of the theory of errors of observation" (W3, p. 114) and an essay "On the Influence of the Flexibility of the Support on the Oscillation of a Pendulum" (W3, p. 217) both for the Coast Survey. He also produced his popular essays, "Illustrations of the Logic of Science" for the *Popular Science Monthly* in 1878, but these are the works of Peirce the teacher, not Peirce the toiler, and they will not detain us long. In "The Order of Nature" (W3, p. 306) Peirce is a skeptical scientist who says that "the universe ought to be presumed too vast to have any character," (W3, p. 320) so that anyone who claims that universe

is benevolent or just or wise relies upon an "ill-founded notion of the finitude of the world." No doubt during this period Peirce was exposed to the cosmological philosophies that had been spurred by developments in astronomy and Darwin's views of evolution. John Fisk had written his *Cosmic Philosophy* by now, in which he traces an evolutionary cosmic development from indeterminacy and undifferentiated-ness to determinacy and complexity, using illustrations from physics, chemistry, psychology, and sociology. Furthermore, the "doctrine of evolution" required acceptance of the relativity of knowledge. Yet Fisk also provides a place for theism based upon the need "to postulate an Absolute Reality,-a Something whose existence does not depend on the presence of a percipient mind Without making such a postulate . . . it would be impossible to frame any theory whatever, either of subjective or objective phenomena. ((John Fisk, *Outlines of Cosmic Philosophy* (Boston: Houghton, Mifflin, 1874), Vol. 2, 414.)) " Peirce, of course, had tried to form many theories without first settling upon an theory of reality, and his own theory of reality at the time was that the 'reality' of a subject was whatever the final opinion on that subject would be. So also, Peirce must have been familiar with the cosmic ideas of his father, later published at *Ideality in the Physical Sciences* in 1881, which also asserts an ideal general character to the universe ((Benjamin Peirce, *Ideality in the Physical Sciences*, (Boston: Little, Brown, 1881) p. 178. "Whether you believe in the law of development or in the law of design, what other conclusion is consistent with your doctrine? There is a *spiritual potentiality of plan, </i> visible to the penetrating eye of the seer as any physical potentiality.")). *From the perspective of such simplistic evolutionism Peirce is a radical who seeks to tear down such beliefs. From his own perspective he was trying to build them up on a rigorous foundation of science and logic.**

In 1879 Peirce was adding new subjects to his logic book. In "Of thinking as Cerebration" he suggested the possibility of a nerve theory of logical

inference, arguing that the structure of thinking follows the structure of the nervous system, and that consciousness requires a nervous system, although also admitting that "to trace the correspondence throughout, with scientific accuracy, would not at present be possible. . . ." (W4, p. 41) He notes that nerves do not just stimulate muscles or glands; they also irritate other more centralized nerves, which transmits this irritation to more centralized nerves, and the brain. This may explain why belief is rest and doubt irritation (W4, p. 41), and why habits are formed based on a single experience: "But so plastic, so to say, are the avenues of nervous discharge in the higher centres, that a single performance of a brain-action suffices for the full formation of a habit." (W4, p. 42) Peirce's remarks are sketchy; I see in them an idea that linear neural connections form perpendicular intersections, in other words, triads, under certain conditions, allowing the 'interpretation' or modulation of the original connection and the formation of rules using signs to form single-instance habits.

Between 1879 and 1884 Peirce taught at Johns Hopkins University. During these years he devoted a great deal of time on the formal study of logic, the algebra of logic, Boolean algebra, number theory, and the logic of relations. In 1883 he drafted an outline of sixty lectures on logic (W4, p. 476), that provides of good road map of where Peirce had been over the past years and where he wanted to go. The following proposed lectures are of interest for our purposes: Lecture II (Physiological and psychological basis of logic. . . . Essential intricacy of connections.) (W4, p. 476); Lecture IV (Reality defined. Historical sketch of different forms of idealism.) (W4, p. 477) Lecture XVII (The principle of continuity.) (W4, p. 486) Lecture XXI (The Categories. Trendelenburg's view. Kantian categories. Other lists, including the lecturer's.) (W4, p. 487) Lecture LX (Anthropomorphic science. . . . Natural theology. One-sidedness of physical science.) (W4, p. 489).

In "Design and Chance" (1883) Peirce questioned the 'axiom' that for each intelligible question there is a "definitive and satisfactory answer." (W4, p. 545-46) This assumption may be founded on nothing more than that our instruments of observation are not refined enough to detect variations that would be counterexamples to any 'law' we would be inclined to formulate. (W4, p. 546) In the "Order of Nature" he had linked 'order' with intelligence: "The actual world is almost a chance-medley to the mind of a polyp. The interest which the uniformities of Nature have for an animal measures his place in the scale of intelligence." (W3, p. 312) Thus, the higher intelligence ought to regard all laws as contingent upon the context of their formulation, in terms of subject matter, instrument, and observer, and should regard law as subject to evolution: "We ought to suppose that as we go back into the indefinite past not merely special laws but law itself is found to be less and less determinate. And how can that be if causation was always as rigidly necessary as it is now?" (W4, p. 548) The real tendency of evolution to produce greater complexity is prohibited, Peirce notes, by the second law of thermodynamics-that energy dissipates and homogeneity increases as a natural course of events-"a truly astounding result, and the most materialistic the most anti-teleological conceivable." (W4, p. 551) ((In the 1870s Ludwig Boltzmann gave a statistical int retation to the second law in a series of papers. It is not clear whether irce had these papers in mind or was acquainted with Boltzmann work.

)) So Peirce believed that although forces may dissipate on local levels,

chance is in the long run concentrative . The dissipation of energy by the regular laws of nature is by those very laws accompanied by circumstances more and more favorable to its reconcentration by chance. There must therefore be a point at which the two tendencies are balanced and that is no doubt the actual condition of the whole universe at the present time.

(W4, p. 551)

3. Royce's Religious Philosophy

In considering the topic of these lectures—mutual affection- we seek a form of dynamism that is not explained in the mechanics of Newtonian physics, nor through thermodynamics, nor in terms of Darwinian evolution. The idealism of Schelling and Hegel address the need for a dynamism that is characterized by 'reciprocity' or 'dialectic'. The Peircean ideas just considered reveal that Peirce too was seeking a different kind of influence not treated in one-sided mechanics, and that he believed that influence, somewhat 'teleological' in nature, was detected when the mind follows idealistic principles. But Peirce was not comfortable with adopting all sorts of idealism wholesale. We know now that as a youth he worked very hard rethinking the thoughts of the Greats back to their roots. In 1885 he produced a review of Josiah Royce's Religious Aspect of Philosophy that was refused publication. Royce's book was a criticism of evolutionism that associated optimism and the growth of complexity. Why is the complex better than the simple?-Royce asked. And, why is such change 'better'? The answer to such questions inevitably presuppose a choice of personal values beyond the reach of science. Royce also asked: "How can I know that there is anywhere a will, W, that chooses for itself some end, E? Really to know this implies something more than mere outer observation of the facts." ((Josiah Royce, The Religious Aspect of Philosophy (New York: Harper, 1958), 134.)) A will is sui generis; it cannot be deduced, nor evolved, nor can it operate without willfully chosen values. Darwin was flat out wrong. There is no descent of man. The sceptic and doubter is wrong to believe that doubt by itself can discover truth. Nor can "empirical teleology" and a "halting half Theism of the empirical Design-Argument" (Royce, pp. 279-80) give us the values we have been accustomed to in a pre-Darwinian

world. Royce questioned the objectivity of scholarship inspired by the new 'scientific age':

Plainly, since active inner processes are forever modifying and building our ideas; since our interest in what we wish to find does so much to determine what we do find; since we could not if we would reduce ourselves to mere registering machines, but remain always builders of our little worlds,-it becomes us to consider well, and to choose the spirit in which we shall examine our experience.

(Royce, p. 323) Science is humbled in the face of the realization that all of its theories, by the very nature of their generality, make assumptions about what is the case in possible worlds. But such assumptions cannot be empirically based since the empirically based relies upon them. Therefore, what is ultimately real must be "in a definite relation of likeness to my present consciousness." (Royce, p. 361) My individual consciousness must partake in an actual world-consciousness. This view subordinates the importance of the postulate of causality and alters our common-sense view of what is real. Causality requires generality and is never about the particular. The same is true of judgments, which can never be in error according to the standards of knowing employed in empirical science, since both subject and predicate are ideal constructions and are always correctly linked within the mind that judges. Only in "the Unity of the Infinite Thought" (Royce, p. 433) does that judgment appear erroneous.

In his review, Peirce described Royce's thesis in the following way: "[T]hat the reality of whatever really exists consists in the real thing being thought by God." (W5, p. 222) This view clashed with that of a "luckless putter-forth" : that the real is that which a person will believe and be ready to act upon if his investigations were pushed sufficiently far. Royce's error, in Peirce's view, was to regard consciousness as a medium in which only

generality can exist. Here Peirce refers to the "insignificant exception of the present writer" (W5, pp. 223-24) as one who has dwelled upon the "transcendental bearings" of the study of formal logic, viz., that all judgment requires an indexical dimension as well as an identification of content, and this only occurs when the mind is capable of establishing an intuitive and immediate link between two sensations. Mind must be enmeshed with will to make this possible. The fact that space and time appear as dimensional grids is evidence of this marking capability of consciousness that Peirce calls "consciousness of duality or dual consciousness." (W5, p. 225) Indexical consciousness involves "the sense of action and reaction, resistance, externality, otherness, pair-edness." (W5, p. 225) By referring to this dimension, I take it, Peirce wants to refute Royce (and Hegel's) idealism that reduces all cognition to the interactions of abstractions. Peirce seems to be saying: there is a potency you attribute to God that we ourselves are capable of experiencing directly.

Peirce also disagreed with Royce's view of God as a measure of truth and reality, as if set apart from it:

I hold another theory, which I intend to take an early opportunity of putting into print. I think that the existence of God, as well as we can conceive of it, consists in this, that a tendency towards ends is so necessary a constituent of the universe that the mere action of chance upon innumerable atoms has an inevitable teleological result. One of the ends so brought about is the development of intelligence and of knowledge; and therefore I should say that God's omniscience, humanly conceived, consists in the fact that scepticism just spoken of would admit this omniscience as a regulative but not a speculative conception.

(W5, p. 229) The emergence of intelligence is a result of the "tendency towards ends"; this tendency reaches everywhere in the universe and its

not a scalar property. It is God or what God does by nature-"as well as we can conceive it."

4. Abbot's Theistic Evolution

Without doubt Peirce was a thoroughgoing evolutionary metaphysician much prior to the 1880s. I believe that he did not come to this view as a 'change' to Darwinianism, but rather through his reflections on the conditions for the possibility a new list of categories based on the analysis of logical inference as sign-reference. Peirce is saying in effect: if there are signs, then the universe is teleological. That is a big leap, but one he was prepared to bridge. His evolutionism at this period was described in Francis Abbot's diary entry for February 13, 1886:

Attended a meeting of "philosophers," including John Fisk, James, Royce, and Perry at Prof. J. M. Peirce's, 4 Kirkland Place, to welcome Prof. Chas. S. Peirce, of Johns Hopkins, (my classmate), and hear from him a new "logical theory of Evolution." Peirce begins with absolute or pure potentiality, with absolute Chance, or negation of all law, even logical, to evolve at last Absolute Being and Absolute Law-in fact, ingenious, and-impossible. Had a wine supper, during which Charley continued to spin his glistening cobweb. Did not break up till near midnight, when I walked home with Fiske. (((W5, p. xxxvii) Also reprinted in Joseph Brent, Charles Sanders Peirce: A Life (Bloomington: Indiana University Press 1993), p. 177.))p>

Such was the life of these gentlemen scholars a century ago.

In 1885 Abbot published Organic Scientific Philosophy: Scientific Theism, based upon a lecture he had given that year at a symposium, along with John Fisk and William T. Harris, on the subject: "Is Pantheism

*the Legitimate Outcome of Modern Science?" Abbot presents a view he calls Relationism, the view that relations are just as real as objects, and that once this is accepted the conflict between scholastic realism and nominalism disappears and both are seen as partial truths. In Relationism "genera and species exist objectively, but only as relations, and that things and relations constitute two great distinct orders of objective reality, inseparable in existence, yet distinguishable in thought." ((Francis Ellingwood Abbot, *Organic Scientific Philosophy: Scientific Theism* (Boston: Little, Brown, and Co., 1885 . 28.)) This insight "occurred to no one," Abbot writes (p. 29), because the nominalists and realists monopolized the debate until Kant achieved the victory for nominalism and phenomenalism. He describes the insight as "Scientific Philosophy":*

The theory of Scientific Philosophy (by which is meant simply the philosophy that founds itself theoretically upon the practical basis of the scientific method) teaches that knowledge is a dynamic correlation of object and subject, and has two ultimate origins, the cosmos and the mind; that these origins unite, inseparably yet distinguishably, in experience, i.e., the perpetual action of the cosmos on the mind plus the perpetual reaction of the mind on the cosmos and on itself as affected by it; that experience, thus understood, is the one proximate origin of knowledge; that experience has both an objective and a subjective side, and that these two sides are mutually dependent and equally necessary . . .

(Abbot, p. 39) Science is a product of this mutuality. Therefore, any philosophy that denies the objectivity of human knowledge is unscientific. And as long as the basis of empirical knowledge is sensation philosophy must be a subjective nominalism that cuts off the real from the phenomenal. Experience must be "enlarged as to include, not only the activity of the senses, but also the activity of the perceptive understanding (intellection, intellectual perception or apprehension or intuition)" and once

this is recognized science reveals within it "a whole philosophy." (Abbot, pp. 110-11) Real objects have real relations, the "immanent relational constitution of the single thing," and between the atom and the person there are "a countless multitude of intermediate composite things." (Abbot, pp. 128-29) Disorder and chaos are impossible in this view; they are merely functions of incomplete knowledge. ("Chance or fate is no hypothesis at all; it is the mere absence, the mere negation, of all hypothesis;" Abbot, p. 153)) So are symbols. Since relations "are the common essence of concepts and things . . . there is no such thing as 'symbolical conceptions' " (Abbot, pp. 138-39) To allow an interpretation of knowledge as symbolical is to open the door to nominalism again. Abbot concludes his argument: since relations are real, the universe is intelligible-since the sole object of intelligence is the positing of a relationship-and if the universe is intelligible it is intelligent. However, since the relations of the universe are infinite the universe must be infinitely intelligible, and therefore infinitely intelligent. It is a self-contained system of systems, an infinite organism manifesting perfection and goodness.

Peirce reviewed Abbot's Scientific Theism for the Nation. Although his tone is gentlemanly, I suspect the smugness of the book must have privately annoyed him. Peirce found vagueness in Abbot's view that relations are hard facts and can exist in groups. And he questioned how a system of systems could have any normative properties ("The religion of the book seems to be only an appendage to a system of metaphysics." W5, p. 286), and how knowledge of relations could be derived without the help of diagrams or visual symbols. (W5, p. 288) But he applauded the book as "a strongly characterized and scholarly piece of work, doing honor to American thought; and it is much to be desired that the world should see the system developed in its entirety." (W5, p. 289)

Metaphysical Renaissance: 1885-1890

After Johns Hopkins Peirce was starting to get his second wind for metaphysics and the refinement of the categories, even while he should have been completing some of his overdue Coast Survey tasks. Some fragments written in 1885 reflect that Peirce has continued to think deeply about his short list of categories and the conditions for their possibility. Hegel's method is not rigorous enough and his categories have "the coherence of a dream." Kant's method, on the other hand, if rigorously applied would require "first, the invention of a perfectly exact, systematic, and analytic language in which all reasoning could be expressed and be reduced to formal rules; and, second, the analysis of the signs of that language so as to make a table of all their varieties." (W5, p. 237) This is Peirce's chosen course. Hegel's categories are too much embedded in ordinary language; they are not sufficiently precise. No effort was made to develop a meta-language to express them and clearly define their boundaries. ("I do not quarrel with the idealism of Hegel because it goes too far; but only because it is too simple an account of a more complicated matter." W5, p. 280)

As Peirce begins the second half of his metaphysical journey, with some urgency, ((In October, 1885 Peirce wrote to his brother All this [the difficulties in the Survey] has awakened me to the duty of making some effort to do that thing for which I am in the world, namely, to ascertain the true nature of logic, and of scientific methods of thought and discovery. I have a great and momentous thing to say on this subject. Without molecular science must remain at a stand-still. . . . To do it I must sit down quietly to it & to teaching, and not live in boxes. . . . But it is certain that so long as I stay in the Survey my destiny will not be fulfilled." (W5, vii))) there is a distinct sense that his original insight that the categories had to be iteratively expressed needed to be justified using the detailed results of the scientific method. Here, of course, he does not differ from Schelling and Hegel; he just knew more science than they did. He is convinced that his new list of three (W2,

p. 55) is correct: now as the First, Second, and Third. But they are not three dimensions of reference and inference. They are three processes that produce the very analysis that results in the new list. Instead of the categories coming out of the head of the philosopher, they produce the philosopher. Thus, Peirce could integrate his categories with the popular notion of cosmic evolution. In one of the 1885 fragments he writes:

Now modern logic enables us to show that three conceptions are really essential in formal logic; so that they are three fundamental categories of thought. Furthermore, reasons can be given for holding that these three conceptions are due to the three fundamental faculties of the mind, and these again to three fundamental functions of the nerves; and finally these to three elementary constituents of the physical universe.

(W5, p. 237) The First is something new, free and fresh, without genesis, the first idea in Adam's consciousness; the Second is something determined by limitation, existing in a real relation to something, a clash, a constraint, and effort, a force, and an end. A Third is a medium between First and Second, the beginning and the end. A Third:

flows from one to the other. It is the representation by which anything is carried out of itself into another. It is that which brings about the pair by establishing a relationship. It is the synthesis (and equally analysis or reversed synthesis). It is the whole which absorbs the parts and makes them belong to one another by belonging to it. It feeds; and it reproduces. It is the whole process by which from the first is evolved the second.

(W5, p. 239; emphasis added) Peirce has described the Third as "the whole process" and the categories as "three elementary constituents of the physical universe." He does not tell us in these passages how this happens. However, based on the above remark we may conclude that he

does not believe that in the beginning there were unconnected, spontaneous Firsts and these came into reaction, each reaction creating a First-Second pair-edness, and by their continued reactions interactions arise, and from those interactions Thirds result. Rather, he says that Thirds are an elementary constituent of the universe that operate on Firsts to turn them into Seconds.

During the Summer and Fall of 1886 Peirce started work on a comprehensive metaphysical treatise that would rival and go beyond Schelling's Naturphilosophie and Hegel's Phenomenology and Encyclopedia. One outline of this work reveals thirteen chapters, starting with the categories, and progressing from formal logic to metaphysics to psychology, physiology, biology, physics, the absolute, laws of nature, consciousness, and ending with theism. (W5, p. 294) The plan is in reverse order of the outline of sixty lectures prepared during the years at Johns Hopkins which ended with the categories. Is there a philosophical reason for the new outline? Is it just a matter of presenting a series of chapters for the student to consider? I see in this sequence the early germinal idea, discussed in Lecture Two, of the progress from abstract unity to concrete plurality to concrete unity, in Hegel's terms manifesting the 'life of the concept' advancing towards its self realization. Peirce plans to begin with a discussion of the three categories; next he shows their operation in logic, metaphysics, psychology, physiology, and biology. Here the progression is from the highly refined consciousness of the philosopher and logician to the relative unconsciousness of biological processes. Three chapters are devoted to physics: "A. Present state of molecular theory. . . . B. No assumption of ultimates logical. . . . C. Axioms." (W5, p. 294) At this point the standpoint has been to analyze the sciences in terms of their actual and erroneous assumptions and to reveal the need for the categories. The analysis of physics constitutes a transition from its existing erroneous atomism to a new physics that can see behind what is masked by

mechanism and causality. The remaining five chapters, on this reading, are the enlightened theories. The ninth chapter Peirce simply calls "the physical theory." May we conclude that this is Peirce's idea of a unified physical theory that includes the dynamics of all interacting physical systems, a 'general system theory' with deep content? The last three chapters-Laws of nature, consciousness and intelligence, and Theism-may have been designed to reveal a normative and regulative dimension, perhaps such as would satisfy a true-value seeking dialectician like Royce or a true-value seeking dogmatism like Abbot.

Over the remaining years of his life Peirce made many starts on this work, and of course he did not complete and publish such a work. Unlike the other wine-sipping Cambridge 'philosophers' he had too many 'momentous' things to say on too many subjects, and worse still was too acutely aware of the limitations and difficulties of existing theories and the need for detailed elaboration, to enable him to get out a book or two on the subject. While still at Johns Hopkins Peirce showed an ability to work in collaborative groups; he was a tremendous catalyst for his logic students. But once removed from that community he was on his own, never again finding a place to belong with true peers on a daily, ongoing basis, not at the Century Club in New York City, the Survey science scene, or in the familiar Cambridge/Harvard social circles.

The years 1886-90 were not philosophically productive years for Peirce. He had many Survey distractions and financial concerns. He tried to make a living as a logician and scientist outside the context of a university, without much success. He continued to write definitions for the Century Dictionary. In the 1889 edition he defined "ideal-realism" as: "the opinion that nature and the mind have such a community as to impart to our guesses a tendency toward the truth, while at the same time they require the confirmation of empirical evidence." He grew more interested in psychic

research and spiritualism as topics that might reveal the influence of nature on consciousness. Although he was fond of noting the reality of Secondness and the Outward Clash he also became more convinced than ever that mechanical philosophy was bankrupt as an endeavor to explain the universe.(CP 6.553f) In 1891 he published in the Nation a review of William James', The Principles of Psychology, and describes the author thusly:

. . . the one thing upon which Prof. James seems to pin his faith is the general incomprehensibility of things. . . . Of course, he is materialistic to the core—that is to say, in a methodical sense, but not religiously, since he does not deny a separable soul nor a future life; for materialism is that form of philosophy which may be safely relied upon to leave the universe as incomprehensible as it finds it. . . . There is no form of idealism with which he will condescend to argue.

(CP 8.58) Peirce was willing to believe that "vivid consciousness, subject to attention and control, embraces at any one moment a mere scrap of our psychical activity," (CP 6.569) but he was not willing to believe that consciousness must forever exist at the same level of ability and performance. Consciousness is a trajectory or it is nothing. Idealism realizes this; materialism does not. Philosophy must be

committed to the assumption that things are intelligible, that the process of nature and the process of reason are one. Its explanation must be derivation. Explanation, derivation, involve suggestion of a starting-point-starting-point in its own nature not requiring explanation nor admitting of derivation. Also, there is suggestion of goal or stopping-point, where the process of reason and nature is perfected. A principle of movement must be assumed to be universal. It cannot be supposed that things ever actually reached the stopping-point, for there movement would stop and the

principle of movement would not be universal; and similarly with the starting-point.

(CP 6.581; emphasis added) Three philosophies of movement are then described: elliptic (there are no end points, "not even ideal" ones, the movement of nature has no definite tendency but just flits about); parabolic (one universal formula governs all movement and "development tends toward the very same nothingness [Nirvana? CP 1.362] from which it advances."); and hyperbolic ("Nature marches from premisses to conclusion; nature has ideal end different from its origin.") (CP 6.582) Elliptic philosophy does not see mind as primordial, but a mere specialization of matter. Parabolic philosophy is nihilism and is the most hostile toward spiritualism. Hyperbolic philosophy assumes an element of unexplainable spontaneity; this is feeling "uncoordinated" (CP 6.582-585) (Here Peirce uses a term from his earliest metaphysical writings.) Feeling plus "the principle of growth of principles, a tendency to generalization" leads to development; the tendency to take habits increases as habits increase; habits coordinate feelings and from this time and space emerge and within that matrix a person comes to be defined.

A Guess at the Riddle

In 1890 Peirce drafted the outline and introduction to a book he wanted to call "A Guess at the Riddle." (CP1.354ff) At the front he wrote: "And this book, if ever written, as it soon will be if I am in a situation to do it, will be one of the births of time." Again, triadic physics is described as the "germinal section." (CP 1.354) We are given more descriptions and illustrations of First, Second, Third. At one point Peirce writes: "The first is agent, the second patient, the third is the action by which the first influences the latter." (CP 1.361) At another he states: "The starting-point of the universe, God the Creator, is the Absolute First; the terminus of the

universe, God completely revealed, is the Absolute Second; every state of the universe at a measurable point of time is the third." (CP 1.362) We must be struck by the dramatic change in Peirce's rhetoric here. Is he attempting to popularize his longstanding work to get a broader audience and respond to the intellectual fashions of the day? I think so, and why not. He had more to say than did Abbott and Fiske on the question of an evolutionary philosophy. He now wanted to apply the three categories "to the deepest problems of the soul, nature, and God." (CP 1.364)

At this time Peirce believed that his method was in "profound contrast with that of Hegel; I reject his philosophy in toto." (CP 1.368) For sometime now he had believed that Hegel's theory was too abstract and did not have a place for the Outward Clash of secondness. But is this really fair to Hegel? Peirce claims that thirdness is the action by which the first influences the second. The first is agent, but so also must the third be an agent of some sort; unlike the first which is spontaneous action, the third is mediating action, and the second is a result or impact. Therefore, secondness is an ordered result, and Hegel would agree that force, even brute force, is ordered in some conceptual framework. How big is the gap between Peirce and Hegel after all? Consider this remark:

Hegel's plan of evolving everything out of the abstractest conception by a dialectical procedure, though far from being so absurd as the experientialists think, but on the contrary representing one of the indispensable parts of the course of science, overlooks the weakness of individual man, who wants [lacks] the strength to wield such a weapon as that.

(CP 1.368) Dialectical thinking is an indispensable part of science, so Peirce is saying. But what scientist today believes this or even knows what such thinking is? Scientists generally are not encumbered with

preconceived notions of what is explainable and what is not. They try to explain everything that holds their interests. In this sense a "dialectical procedure" is a heavy weapon that is more burdensome than useful. Consider Peirce's remark: "Indeterminacy, then, or pure firstness, and haecceity, or pure secondness, are facts not calling for and not capable of explanation." (CP 1.405) This is a statement of the dialectical philosopher, not of the dialectical scientist who is never sure when an instance of 'pure' firstness or secondness is being identified.

The scientist is suspicious of anything that looks like a genuine firstness or secondness; he or she is most comfortable with thirdness. The scientist is in the business of converting as much of reality to thirdness as possible, and has little use for metaphysical distinctions, whether Peirce's or Hegel's. This being said there remains a major distinction between Peirce and Hegel: Hegel seemed to present his views as an enlightenment and dogma; Peirce spoke mainly of his triadic metaphysics as hypothesis to be used and refined to see if may assist experimentation and discovery. More on this shortly.

The Monist Series

During 1891-93 Peirce published a series of metaphysical papers in The Monist: "The Architecture of Theories," (1891), "The Doctrine of Necessity Examined" (1892), "The Law of the Mind" (1892), "Man's Glassy Essence" (1892), and "Evolutionary Love" (1893). Since our purpose in these lectures is to trace a germinal idea in Peirce's metaphysics I shall not consider all aspects of these papers. Here is a laundry list that refers to topics touching on our theme.

1. *Natural science must be based upon a 'great theory' that is constructed architectonically, beginning with an analysis of the foundations of logic and mathematics. (CP 6.8f)*

2. *Physical dynamics, thermodynamics, molecular theory, psychology, and evolution rest upon unarticulated or incorrect assumptions that will block advancement in these fields. (CP 6.10-23)*

3. *The 'great theory' might develop out of an ancestor such as objective idealism, so far "the one intelligible theory of the universe . . . , that matter is effete mind, inveterate habits becoming physical laws," (CP 6.25) and that theory would have to account for the increase in complexity in nature. (CP 6.58) Physical events are really "degraded or undeveloped forms of psychical events." (CP 6.264)*

4. *The belief that precise conditions produce precise results through the operation of precise forces is not based on observation. Physical causation is an axiom that does not explain how causes and effects occur in nature. Therefore, we must look for "the influence of another kind of causation" instead. (CP 6.60) Such a causation would contain an element of spontaneity "which is to some degree regular" and would follow an objective logic like Hegel's. (CP 6.64)*

5. *The clue to the other form of causation is found in the workings of the mind and its conscious states. (CP 6.60) Here examination reveals a general law of mental action (CP 6.103), viz., "that ideas tend to spread continuously and to affect certain others which stand to them in a peculiar relation of affectibility. In this spreading they lose intensity, and especially the power of affecting others, but gain generality and become welded with other ideas." (CP 6.104) This is "an abridged statement of the way the universe has been evolved." (CP 6.143)*

6. *That the flow of time is irreversible is due to the law of the mind; mental action differs from physical action, which is reversible. (CP 6.127-131) Mental action is also cumulative: "every state of feeling is affectible by every earlier state." (CP 6.131)*

7. *Affectibility involves the marking of the affected by the affector in such a manner that the affected contains a generalized character of the affector. (CP 6.135-143) As affections accumulate a habit results. (CP 6.145) These properties require that continuous, overlapping events occur in nature (synechism).*

8. *There is no "general formula" (CP 6.152) for the action of mental affection due to "a certain amount of arbitrary spontaneity in its action." (CP 6.148) However, that arbitrariness in human minds "is neither altogether trifling nor very prominent." (CP 6.154) Such affection also reveals a "teleological harmony" (CP 6.156) and has the characteristics of what we call personality. (CP 6.155ff, 6.268ff)*

9. *Affection is a result of love, whether erotic, cherishing, or kind. Love obeys a dynamic different from physical mechanics, social Darwinism, or red-tooth capitalism: "The movement of love is circular, at one and the same impulse projecting creations into independency and drawing them into harmony." (CP 6.288) This view makes for an agapastic theory of evolution (CP 6.2950 and a Lamarckian evolution of mind (CP 6.301), elements missing from Hegel's objective logic (CP 6.313) The impulse to think and reflect is nurtured by the "power of sympathy" which creates a desire to think generally, to purposively develop an idea (CP 6.315), and to express and share that development within a community. (CP 6.306)*

Hegel's Objective Logic

Around 1893 ((Also around 1893 Peirce was working on a treatise called 'Grand Logic' which, in part, considered second-intentional logic, or objective logic'-“the larger part of formal logic. It is also the more beautiful and the interesting subject; and in serious significance it is superior in a far higher ratio.” (4.80))) Peirce prepared a prospectus for his grand work of metaphysics, the early outlines of which we have been considering. In the prospectus he wrote:

This philosophy, the elaboration of which has been the chief labor of the author for thirty years, is of the nature of a Working Hypothesis for use in all branches of experimental inquiry. Unmistakable consequences can be deduced from it, whose truth is not yet known but can be ascertained by observation, so as to put the theory to the test. It is thus at once a philosophy and a scientific explanation of observed facts. . . .

The principles supported by Mr. Peirce bear a close affinity with those of Hegel; perhaps are what Hegel's might have been had he been educated in a physical laboratory instead of in a theological seminary. Thus, Mr. Peirce acknowledges an objective logic (though its movement differs from the Hegelian dialectic), and like Hegel endeavors to assimilate truth got from many a looted system. . . .

The entelechy and soul of the work, from which every part of its contents manifestly flows, is the principle of continuity, which has been the guiding star of exact science from the beginning, but of which novel and unexpected applications are now made. The logical ground of this principle is examined and its precise formula established. . . .

The principle of continuity leads directly to Evolutionism, and naturally to a hearty acceptance of many of the conclusions of Spencer, Fiske, and others. Only, Matter, Space, and Energy will not be assumed eternal, since

their properties are mathematically explicable as products of an evolution from a primeval (and infinitely long past) chaos of unpersonalized feeling. This modified doctrine, so much in harmony with the general spirit of evolutionism, quite knocks the ground from under both materialism and necessitarianism.

(Collected Papers, Vol. 8, pp. 282-283) The doctrine of Hegel that Peirce referred to in his later metaphysical period is objective logic. Objective logic is the logic of the universe; its subject is more encompassing than mind. Instead of logic being the subject of the mind's manipulation of symbols, it is regarded as the manipulation of mind and all things by signs or laws or some sort of rational structure. Over the next ten years, to jump ahead of ourselves for a moment, Peirce came to see objective logic as the logic of events and as a living process. In about 1902 he wrote in his "Minute Logic" :

. . . . we have to examine whether there be a doctrine of signs corresponding to Hegel's objective logic; that is to say, whether there be a life in Signs, so that—the requisite vehicle being present—they will go through a certain order of development, and if so, whether this development be merely of such a nature that the same round of changes of form is described over and over again whatever be the matter of the thought or whether, in addition to such a repetitive order, there be also a greater life-history that every symbol furnished with a vehicle of life goes through, and what is the nature of it.

(CP 2.111) Peirce debated whether this "certain order of development" was utterly rational or admits of irrational episodes. He seemed to think the latter. (CP 6.217)

Let us take a walk through Hegel's garden of objective logic, before turning to Peirce's version. Objective logic is the attempt to produce a system of relations that is formally and materially complete. It encompasses all things and relations, not merely their classification, but how they interact and the results of those interactions. In its elemental form, where differentiation is limited, its form and content are considered identical. In his Logic Hegel observes that the dialectical method is the true method because of "the fact that the Method is no-ways different from its object and content;-for it is the content itself, the Dialectic which it has in itself, that moves it on." ((G.W.F. Hegel, Science of Logic, trans. W. Johnston and L.G. Struthers (London: George, Allen & Unwin, 1966) I . 65.)) Thus, the philosophic problem of objective logic is to explain how the dialectic begins without reference to something outside it. Another closely related problem is to come up with a formal language that reveals the dialectical connections and imports as little additional content as possible. The usual classifications of the dialectical system are of very little help: Thesis/Antithesis/Synthesis; Abstraction/Absolutization/Internal Relation/Negation of Other/Self Negation/Negation of Negation; ((Clarke Butler, "On the Reducibility of Dialectical Logic to Standard Logic," Personalist 56 (1975): -431.)) or Pure Being/Pure Disjunction/Determinate Being/Systematic Unity. ((Leslie Armour, Logic and Reality: An Investigation into the Idea of a Dialectical System (Assen: Van Gorcum, 19 .59)) Hegel's Logic provides a shorter list: Being/ Essence/Concept. I have suggested Abstract Unity/Concrete Plurality/Concrete Unity in connection with Peirce's early discussions on categories.

There is no formalization in Hegel's Logic. Surely, this troubled Peirce who had developed the logic of relations beyond anything Hegel knew could be possible. And there is no evidence that Peirce had ever attempted to formalize the Hegelian dialectic. I do not think that Peirce believed that the Outward Clash, chance, and indexical reference, which are unique events,

were absolutely intractable to formalization. I suggest the following scheme to describe the Hegelian dialectic, consisting of five recursive stages:

1. P Positing

2. $P \textcircled{R} \sim P$ Negation

3. $\sim P \textcircled{R} Q$ Affirmation

4. $P \textcircled{R} Q$ Equation

5. Q Conclusion

The 'conclusion' is at once a result and a new positing because the dialectic is always in motion. Using Q the steps are then repeated. This is a formalization that illustrates that negation turns into affirmation. But it does not explain how this, Step 2, can occur and provides no formalization of this process. Hegel's explanation is that the Concept is living and living things grow and change in certain ordered ways. There is an evident craving for details and we can feel Peirce's frustration as we retrace Hegel's steps. However, the above five steps may be used to understand the evolution of categories in Hegel's system. Not all of the linkage is clearly evident, in part because Hegel used natural language. Seventy-two steps are needed for Being to become Essential Being and then Concept.

1. Being [Quality]

2. Not-Being

3. Nothing

4. *Not-Nothing*

5. *Something*

6. *Not Something*

7. *This Thing*

8. *Not This Thing*

9. *That Thing [Other]*

10. *Not That Thing1*

11. *That Thing2*

12. *Not that Thingn (n[®])*

13. *Infinite Other-Things [Infinity]*

14. *Infinite Not-Other Things*

15. *Infinite One [Self]*

16. *Infinite Not-One*

17. *Infinite Void*

18. *Determinate Void*

19. *Determinate One*

20. *Determinate Other-One*
21. *Many Determinate Ones [Repulsion]*
22. *One Determinate Many [Attraction]*
23. *Determinate Quantity [Quantum]*
24. *Indeterminate Quantity*
25. *Determinate Plurality [Amount]*
26. *Determinate Unified Plurality*
27. *Unit of a Plurality [Measure]*
28. *Unit within Plurality of Units*
29. *Measure of Unit by Plurality*
30. *Measure of Plurality by Measured Unit*
31. *Measure of Measured Unit by Remeasured Plurality*
32. *Discontinuity of Measure*
33. *Measureless Quantity [Qualitative Quantity]*
34. *Quality of Measurelessness*
35. *Equivalence of Quantity and Quality*

36. Negation of Being as Pure Determination

37. Being as Concrete Determination

38. Negation of Being as Concrete [Reflection]

39. Positing of Being as Concrete

40. Essential Concreteness of Being [Essence]

41. Essential Being

42. Inessential Being

43. Mere Show of Being

44. Non-Show of Being

45. Being Not-Shown

46. Non-Being of Show

47. Equivalence of Being and Show

48. Difference of Being and Show

49. Opposition of Being and Show

50. Grounding of Show in Being [Ground]

51. Show as Mediation of Being

52. Being as Condition of Show

53. Show as Appearing Being [Appearance]

54. Unconditioned Being [Fact]

55. Thing-in-itself [Existence]

56. Thing-as-Other [Matter /font>

57. Simple Phenomeno

58. Unified Phenomena [Law

59. Appearing Worl

60. Essential Worl

61. Essential World-Structure [whole/part, force/man station, inner/outer

62. External Show of Worl

63. Attribute of World-in-Itsel

64. Self-Manifestation of Worl

65. Actual World-in-Itself [Actuality /font>

66. Potential World-in-Itsel

67. Relatively Necessary World-in-Itsel

68. *Absolutely Necessary World-in-Itself*

69. *Absolutely Necessary Self-Relation of World-Parts [Substance*

70. *Absolutely Necessary Other-Relation of World-Parts [Causality*

71. *Absolutely Necessary Interaction of World-Parts [Reciprocity*

72. *Unified World [Concept*

One cannot help notice Peircean themes in this string of categories relating to the early long lists and the shorter "New List." Hegel's dialectic of logic is still a dialectic of logic. As objective logic is presented as a process of discrimination and progressive disambiguation of our ordinary conceptions (thing, this, this much, group, regularity, etc. etc.) It describes thought prior to its rigorous formalization in mathematics and logic, the kind of thought that is engaged in scientific thinking. The entire Logic describes four worlds: of monadic being (Being), of reflection (Essence), of monadic reflecting being (Concept), and of inter-reflecting beings (Idea). This is the abstract portion of a dialectic of Idea, Nature, and Spirit. From this perspective Peirce's criticism that Hegel does not account for the Outward Clash is a sort of category mistake. The Logic does not explain why there are Outward Clashes just as it does not explain why there must be being rather than nothing. Outward Clash is part of nature, not treated in the Logic.

Hegel's four logical worlds seem to clash with Peirce's three worlds. In the "New List" he was treating of triadicity in predication. A sign is an example of Thirdness and looks like what Hegel called a Concept, i.e., monadic reflecting being. But signs are themselves objects of interpretation; reflection on signs by interpreters, even though the interpreter is using other signs, is nothing just on the level of signs, but looks like the fourth dimension of

inter flexing beings. Is the reduction of Fourness to Threeness accomplished by ing that Signs are beings and persons or interpreters are signs #9; This is a question at the limits of Peirce's system.

Hegel's theory of dialectical categories is definitely a top-down theor Peirce's appears more a bottoms-up theory. The many logic book outlines he wa roposing were strictly to be illustrations of the theoretical usefulness of triad thinking in the sciences. It was in that context that Peirce wanted to bui a theory of speculative physics that would have sufficient theoretical richness explain the development of organisms through an evolutionary process. Hegel's gic, as I have described it, appears deductive and a priori. I think P ce would have abandoned his theory if it were discovered that Firstness, ondness, and Thirdness are just fundamental laws of inference, but not funda tal laws of nature or even of something as remote as alien-creature intel igence.

Kempe's Static Logic

Around or before the time of the "Guess" paper Peirce ceived a challenged to his triadic categories when he read Alfred Bray Kem s paper, "A Memoir on the Theory of M ematical Form." ((Philosophical Transactions of the Royal ciety of London, Vol. 177, Part 1, pp. 1-70. Peirce kept Kempe in mind much of the 1890s. In 1897 they replied to each other in short articles in Monist.)) Kempe proposes a dyadic system as a formalization of l things and relations. Any given system, he argued, may be described by units d links. If new properties of a system are to be described that are not able to b escribed by the existing units and links, then new links and units must be roduced. Kempe's thesis is s eeping:

3. Whatever may be the true nature of things and of the ceptions which we have of them (into which points we are not here concerned t nquire), in the

operations of reasoning they may be dealt with as a number separate entities or units.

4. These units come under consideration in a variety garbs-as material objects, intervals of time, processes of thought, points, lines, tements, relationships, arrangements, algebraical expressions, operators, rations, &c., &c., occupy various positions, and are otherwise circumscribed

(Kempe, p. 2) The units that may be described are of "endle variety: thus we may have a material object dealt with as one unit, a quality i ossesses as another, a statement about it as a third, and a position it occupi in space as a fourth." (Kempe, p. 4) Kempe defines a 'system' as follow "If every component unit of a collection is distinguished from every it which is detached from the collection, the collection will be termed a system ." (Kempe, p. 6) *Thus, a system has a closeness of its units that m them as being part of the system and not part of anythin else.*

The significance of Kempe's system to Peirce is that he seems to hav escribed a system of notation that has no need for a special character of irdness. The link between units does not have any of the characteristics Peircean Thirdness and is a unit in its own right. Kempe's ontology seems require that no matter how diffuse, blurry, vague, or elusive a thing or cess may be-such as an electron with a blurry probabalistic orbital-it may be entified as a discrete unit in mathematical reasoning. Peirce's ontology makes ntinuity a process of nature that requires an analysis that is richer tha nits and links, even richer than the calculus with its assumptions about infi esimals. Nonetheless, Peirce considered Kempe's paper "a formidable o ction to my views" and "of extraordinary value." (CP 3.423) he also claimed Kempe's diagrams do not represent anything; therefore, &quo t is not surprising that the idea of thirdness, or mediation, should be scarcely cernible when the representative character is left out of account." (CP 423)

But in 3 & 4 of Kempe's paper it is clear that although the goal is provide a formalism for all mathematical forms (1) he also believes th the true nature of things may be "dealt with" in the operations o easoning using his system. This, Peirce contends, he cannot achieve. As lo as Kempe illustrates his system by making reference to concrete particulars we a familiar with his units have clear reference; but when he refers to a pro s with a unit "the diagram fails to afford any formal representation of e manner in which this abstract idea is derived from the concrete ideas." P 3.424) Peirce did not want a system of notation that contained terms for that is describable; after all, a spot could adequately refer to the unive and all that there is, just as the word 'being' in Hegel's dialectic form y could. He wanted a system that was "connected with nature" (CP 423) and that was linked to a process of discovery: "The difference betw setting down spots in a diagram to represent recognized objects, and makin ew spots for the creation of logical thought, is huge." (CP3.424) Coul emp have formalized the processes involved in creating and testing his system notation without reference to concepts not described in the system? That is o question Peirce seems to be asking. A simpler question is: Is it possible t epresent a process such as 'A gives G to B' (CP 3.42 as a set of dyadic relations? The answers to both is: No. No representati could be dyadic even though the expression 'A represents B' has at form. This was established in the "New List" argument. And no pr ss could be dyadic if fully described because it always involves a starti point, a subsequent point, and continuous transitional states between the wherein each state must be characterized in terms of both before and after tates.

The Logic of Mathematics as Objective Logic

Around 1896 Peirce produced one of his most sustained, organized, a creative works, an essay entitled "The Logic of Mathematics; An Attempt Develop My Categories from Within." (CP 1.417-520) If only he had s down

and worked and reworked this essay, gradually adding from his notes piece by piece, he would have produced a masterpiece. This paper, even as it stands, is summation of much of his work on the triadic categories and may be regarded as a more developed answer to Kempe and Hegel. Peirce had frequently said that traditional metaphysics aped mathematics and logic in its deductive form and supposed rigor, but with the revolution in math and logic a new foundational start was required. Even though mathematics and logic had changed and become nonstandard from the perspective of the traditional doctrines, this did not mean that such rigor was no longer possible. It only meant that a new effort was needed to define and apply the new forms of mathematical necessity because "this necessity must spring from some truth so broad as to hold not only for the universe we know but for every world that God could create" and would reveal "the most universal categories of elements of all experience, natural or possible." (CP 1.417)

In "The Logic of Mathematics" Peirce talks more about monads, dyads, triads, tetrads, than of Firstness, Secondness, Thirdness. He wants to develop a more enriched language of categories, with perhaps computational ability. He begins with quality and phenomenon no matter how "complex and heterogeneous." (CP 1.425) To the extent that these have character they have a monadic aspect." (CP 1.423) Now there are various distinct ways in which we may characterize a quality-phenomenon. Peirce lumps all of them under heading 'fact'. Facts are described using terms like: brute force, contingent, identical, existent, determinate. Here are some of the characteristics on Peirce's list (CP 1.435): (1) facts are a characteristic that distinguishes the fact of something from the quality of that something; in other words, regardless whether quality 'really exists' it is a fact and that fact does not depend in any way on the quality itself; (2) some facts have an appearance as being 'accidental' rather than seemingly necessary; (3) facts are always here and now (4) every fact has a subject, what the fact is about; (5) "every fact is connected with a reciprocal fact, which may or may not be

inextricably bound up with it." (CP 1.436); (6) facts may always be classified in terms of dichotomies. Appealing to our ordinary conceptions of factualness, Peirce wants us to realize that all facts are determinate in relation to something beyond them; they are dyadic. Begin with any quality, no matter how little in content it contains when that quality is determined by positing it, forming the set:

{Quality, Quality Posited}

Whatever is posited is represented and determined by that representing. Therefore, "given any possible determination, there is a possible further determination" and "every determination gives a possibility of further determination." (CP 1.447) This is true even for the quality of absolute nullity:

{Nullity, Nullity Posited}

From the act of positing any monad (even the entire universe) we may dichotomize:

{Monad, Nullity}

and

{Monad, Monad Thought}

and

{Monad, Non-Monad}

and

{Non-Monad, Nullity}

The last is not identical simply because identity is a dyadic relation (CP 1.446) and may be further dichotomized:

{Non-Monad Thought, Nullity Thought}

and

{Non-Monad Thought, Nullity Not Thought}

etc, etc. Philosophers and theoretical physicists made advances making in this way, e.g., the uncertainty principle in physics, or phenomenalism in philosophy. The above examples also illustrate Peirce's claim that "it is possible to form a single class of dyads; two classes of dyads must be formed at e." (C 1.450)

Dyads may be regarded monadically. Look at how Hegelian Peirce re on this point:

When we come to the dyad, we have the unit, which is, in itself, entirely without determination, and whose existence lies in the possibility of an identical opposite, or of being indeterminately over against itself alone, with a determinate opposition, or over-against-ness, besides.

(CP 1.447) Peirce admits to sounding Hegelian, but he believes his dichotomizing to be superior to that of Hegel outlined above because it "has a broader form, capable of diversification to adapt itself to the special form of the germinal conception. It is not yet time to formulate it." (CP 53) What is the germinal conception? We may only wonder.

Peirce has shown that there are no true monads; that monads are really dyads in various degree. He could also have stated that all quality and firstness requires judgment and secondness, as he did in the "New List" paper in 1867. Dyads take various forms. If something is a monad and that monad 'exists' it is a dyad of inherence. A collection of monads is really a collection of dyads if each is only accidentally related, without further relation or interaction. Regarded as a collection the monads are transformed into dyads by requiring a determination of being a member of the collection, and further determinations relating to each's relation to each other. Existence is a determination that requires more than qualitative determination makes possible. I do not denote opposition for "a thing without opposition ipso facto does not exist." (CP 1.457) Thus, a dyad of inherence exists by virtue of its opposition and resistance to opposition. How then can it be possible for a collection to exist? Peirce defers on this question. (CP 1.457) Peirce also states: "reaction among individual things can create one of those things nor destroy it; before its existence or after it there would not be anything to react. that the fountain of existence must be sought elsewhere." (CP 1.460) his remark illustrates the use of the logic of mathematics. When carefully defined simple notions are developed in a systematic fashion they elucidate by comparison different aspects of conceptions used in ordinary language. Here again is a proof to see the superiority of Peirce analysis and categories over those of Hegel.

We have seen that dyads of monads transform monads and that dyads may be characterized by what they connect, producing either an internal (inherence) or external (relational) connection. The latter are dichotomized further into dyads of identity or of diversity, and dyads of diversity are dichotomized into those of agreement (similarity) or difference. Dyads of diversity result from the influence of one monad on the other; this influence involves "action or force, not in a narrow scientific sense, but in the sense in which we speak of the will as a force not; (CP 1.466) Peirce wants a

broader conception than physical force (*ma*); that is why I use 'influence'. Now influence may be comparative or sertive; a monad may suffer by comparison or may be assaulted. Diverse dyads e, then, either qualitative or dynamical. Dynamical dyads are dichotomized terms of the nature of the forceful influence. If it is symmetrically reciproca A is one mile from B) the dynamical dyad is materially unord d; if it is asymmetrically reciprocal (A kills B) the dyad is terially ordered. Materially-ordered dynamical dyads are dichotomized by t question whether either of the monads could have the asymmetrical influence whether only one of the monads could be the agent of the influence in quest . In the former case the dyads are formally unordered, in the latter they a formally ordered. The mutual attraction of amber and fur is formally unorde because although each attraction is of opposite charge, the influence of ea upon the other is the same; both is a agent and patient at once. (CP 1.46 When one alone is agent and the other patient, i.e, when dyads are formal ordered, the nature of the influence may be distinguished into effects on patient that are accidental (actional dyads) from those that condition the y dyadic existence of the patient (productive or poietical dyads). (C 1.469)

I have only summarized portions of the "Logic of Mathematics.&q ; Peirce believed that it was not "a fancifully imposed scheme, but springs evitably from the evolution of the conceptions according to the general po of view adopted." (CP 1.470) A circle, or rather spiral, may be dete d in the development from the bare to productive monad, formally similar to Hegel's elopment from Being to Concept, though with many differences. Although operating by chotomy, Peirce is not proposing a binary system. Just as monads are really ads when monads are regarded as subject, dyads are really triads when mona are seen in dyadic relations of various sorts. This was Peirce's criticism o Kempe.

Turning to the treatment of triads in the "Logic" these may be genuine or degenerate. Degenerately they may be monadically or dyadically degenerate. A triad of three subjects is genuine when the triadic character appears in any description of any of the six permutations of any two subjects. (CP 71) This character is itself a "monadic element" (CP 1.472) and cannot be resolved into dyads. (CP 1.473) A monadically degenerate triad is a collection of three qualities with no internal connection, for example: red and green resemble each other more than they resemble each other. (CP 1.473) A dyadically degenerate triad may occur in various degrees of degeneracy. Thus, 'A is the father of B and B is the father of C' is a more genuine degenerate triad than 'A is the mother of B and B is the wife of C'. A similarity of process flows through the first example, binding A, B, C, since B's relation to A is like C's relation to B, whereas in the second example no such similar relation exists. A genuine triad may be illustrated by 'A enters into contract C with B'. Peirce gives this example; it is a good one. (CP 1.475) A contract requires a meeting of minds. A and B must intend to achieve the same result, to be bound by the same rules, and the written document or spoken words must reflect that intent by virtue of its content. If that does not happen a contract is not formed. If I sign my name to a piece of paper with writings in language I do not understand I do not make a contract. Much of the common statutory law of contracts is set upon the task of establishing triadicity.

A genuine triad involves some form of generality, and generality refers to something concerning "every possible object of some description." (CP 1.476) Three forms of genuine triads are described. Since all genuine they all involve some form of generality or law. Laws of quality are simply generalizations about qualities-Peirce gives Newton's law of color mixture as an example (CP 1.482)-which may be triadically divided into generalizations such as each quality taken by itself is 'perfect' (is its own standard), and generalizations about how qualities are similar or different, and finally generalizations about the qualities of groups or kinds of qualities. (CP 1.484) L of

fact are also divisible into laws of logical necessity and laws of logical contingency. A "thoroughly genuine triad" (CP 1.480) contains a representation which involves a sign, representamen, and an interpreting thought.

Peirce's use of the terms monad, dyad, triad in "The Logic of Mathematics" indicate that he views these terms relationally and not as names things. A triad has a monadic aspect; being a triad it cannot be a monad the same way a monad can be; but it can be a monad if it is viewed in a broad context and functions like a monad. Even a monad in Peirce's view dissolves into dyadicity when analyzed. After completing his analysis Peirce considered two questions: What is time? Doesn't time order all events, whereas the derivation of dyadicity seems timeless or atemporal? By now we know the answer-No. Temporality embedded in and only a stratum in of the complex from monad to triad. The second faculty: In reality monads may exist without reference to anything else, so that Leibniz was right in saying that they had no windows. Therefore, "The Logic of Mathematics" is really just about symbols and conventional uses, and is no better than Kempe's formalism because it never touches real. Peirce admits that his approach uses the triad to get at the monad as "scaffolding" and that this is a "vague method when stated in general terms"; but he believes the method a good one for breaking down and reshaping conceptions such as 'time', 'existence', 'causality', 'quality' as used in metaphysics to reveal the metaphysical truth behind ordinary experience. This is what objective logic is supposed to accomplish after all. If there is to be a road that leads to a general theory of categories and a method of generating the list of metaphysical categories Peirce seemed to think his analysis of Firstness, Secondness, and Thirdness reformulated in "The Logic of Mathematics" may have been a good start on that road. We shall see in the following lecture to what extent Peirce could achieve his goal of establishing on a better foundation the long list of categories so brilliantly displayed in his youth.

