

# Peirce and Lonergan on Inquiry and the Pragmatics of Inference

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**ABSTRACT:** Drawing on the work of Charles Peirce and Bernard Lonergan, I argue (1) that inferences are essentially related to a process of inquiry, (2) that there is a normative pattern to this process, one in which each of Peirce's three distinct types of inference—abductive, deductive, and inductive—plays a distinct cognitive role, and (3) that each type of inference answers a distinct type of question and thereby resolves a distinct kind of interrogative intentionality.

The path of all knowledge leads through the question. . . . All questioning and desire to know presuppose a knowledge that one does not know; so much so, indeed, that a particular lack of knowledge leads to a particular question.

—*Hans-Georg Gadamer*<sup>1</sup>

Every step in [an] argument depends on asking a question. The question is the . . . motive force.

—*R. G. Collingwood*<sup>2</sup>

**P**HILOSOPHERS COMMONLY CLASSIFY inferences as either “deductive” or “inductive.” The former term covers those in which the conclusion purportedly follows from the premises with necessity; the latter those in which the premises purportedly confer only some degree of probability on the conclusion. The distinction can also be cashed out by saying that deduction is “explicative” because one purportedly draws out what is implicitly given in the premises, whereas induction is “ampliative” because one purportedly extrapolates beyond the premises. In any case, the great American philosopher and logician Charles Peirce insisted throughout his career on the importance of distinguishing between two fundamentally distinct types of ampliative inference, which led him to posit a *threefold* classification of inferences. In his early writings<sup>3</sup> Peirce labeled these “deduction,” “induction,”

<sup>1</sup>Hans-Georg Gadamer, *Truth and Method*, 2nd rev. ed. (New York NY: Continuum, 1988), pp. 363, 365–66.

<sup>2</sup>R. G. Collingwood, *The Idea of History*, rev. ed. (Oxford UK: Oxford Univ. Press, 1993), p. 273.

<sup>3</sup>References to Peirce's writings are normally given in the text as follows:

*W* = *Writings of Charles S. Peirce: A Chronological Edition*, 6 vols. to date, The Peirce Edition Project, M. Fisch, C. Kloesel, and N. Houser, eds. (Bloomington IN: Indiana Univ. Press, 1982–);

*EP* = *The Essential Peirce: Selected Philosophical Writings*, 2 vols., N. Houser, C. Kloesel, and The Peirce Edition Project, eds. (Bloomington IN: Indiana Univ. Press, 1992–1998);

and “hypothesis” (later “abduction” or “retroduction”), and distinguished between them in formal terms.<sup>4</sup> But from at least 1901 on, he shifted emphasis from form to function.<sup>5</sup> According to his mature thought deductive, inductive, and abductive inference are to be distinguished primarily by the *roles* they play in a process of inquiry.<sup>6</sup>

In this paper I develop and defend Peirce’s functional classification scheme by arguing (1) that inferences are essentially related to a process of inquiry, and (2) that there is a normative pattern to this process, one in which each distinct type of inference plays a distinct cognitive role. In addition, by drawing on the independent work of Bernard Lonergan, I show (3) that each type of inference answers a distinct type of question and thereby resolves a distinct kind of interrogative intentionality. I should note that, while I aim to be historically responsible in the positions that I attribute to Peirce and Lonergan, my primary motivation is philosophical. I draw on their work because they make important contributions to what I take to be an illuminating and fundamentally correct account of the pragmatics of inference in relation to inquiry.

### INFERENCE AND INQUIRY

With Peirce, I take inferences to be conscious, belief-forming cognitive events over which we have a measure of control.<sup>7</sup> Given that understanding, it makes sense to

*CP* = *Collected Papers*, 8 vols., Charles Hartshorne, Paul Weiss, and Arthur Burks, eds. (Cambridge MA: Harvard Univ. Press, 1931–1958).

In each case, I give the volume number, followed by a period, and then either a paragraph number (*CP*) or page number (*W* and *EP*).

<sup>4</sup>Beginning with his 1865 Harvard Lectures and 1866 Lowell Lectures (*W* 1), Peirce sought to ground his threefold classification of inferences by associating them with different inversions of a categorical syllogism in Barbara. He developed this idea with particular clarity in his 1878 paper “Deduction, Induction, and Hypothesis” (*W* 2.323–38). He there identified deduction with the inference of a conclusion (Result) from a major premise (Rule) and a minor premise (Case), induction with the inference of a Rule from a Case and a Result, and hypothesis with the inference of a Case from a Rule and a Result. In his 1883 essay “A Theory of Probable Inference,” Peirce extended this approach to accommodate statistical reasoning (*W* 4.408–50).

<sup>5</sup>In 1902, Peirce wrote of his 1883 “A Theory of Probable Inference”: “In what I there said about ‘Hypothetic Inference’ . . . I was too much taken up in considering syllogistic forms and the doctrine of logical extension and comprehension, both of which I made more fundamental than they really are” (*CP* 2.102). For detailed discussion of this shift in Peirce’s thought, see Isaac Levi, “Inference and Logic According to Peirce” in *The Rule of Reason*, ed. J. Brunning and P. Forster (Toronto, Ontario: Univ. of Toronto Press, 1997), pp. 34–56; and “Beware of Syllogism: Statistical Reasoning and Conjecturing According to Peirce” in *The Cambridge Companion to Peirce*, ed. Cheryl Misak (Cambridge UK: Cambridge Univ. Press, 2004), pp. 257–86.

<sup>6</sup>This seems to be consistent throughout Peirce’s later writings. See, for example, “On the Logic of Drawing History from Ancient Documents” ([1901] *EP* 2.75–114, esp. 94ff.); “Sundry Logical Conceptions” ([1903] *EP* 2.267–88, esp. 278–88); and “A Neglected Argument for the Reality of God” ([1908] *EP* 2.434–50, esp. 440–42).

<sup>7</sup>Peirce officially defines an inference as a “conscious and controlled adoption of a belief as a consequence of other knowledge” (*EP* 2.22). Besides inferences properly so-called, Peirce recognizes cognitive events that are analogous to inference in that they are belief-forming and take propositional input, but that are properly non-inferential because they occur without conscious appreciation of the logical connection between propositional input and belief output and therefore do not take place *because of* that appreciation. Peirce calls these “associational suggestions of belief” and contrasts them both with “reasonings”—in which we are “conscious, not only of the conclusion, and of our deliberate approval of it, but also of its being the result of the premiss from which it does result, and furthermore that the inference is one of a possible class

ask “why be logical?” In other words, what does it mean to reason or infer *well*? And why should we take pains to exercise what control we have over our cognitive processes to ensure that we infer well when we do infer? Finally, what sort of pains should we take to that end? A first step toward answering such questions lies in recognizing two general features of our epistemic situation.

First, our epistemic situation is far from perfect. Hume writes, “so narrow are the bounds of human understanding, that little satisfaction can be hoped for in this particular, either from the extent or security of [our] acquisitions,”<sup>8</sup> thereby calling attention to two ways in which our epistemic situation falls short of perfection: *extent* and *security*.<sup>9</sup> With regard to extent, there is much we do not know and much that, given our current limitations, we cannot know.<sup>10</sup> Moreover, much of what we can know is not so easily accessible that we can simply take a look and thereby come to know how things stand. Without an indirect, and therefore inferential, means of arriving at knowledge of the unobserved on the basis of what we do observe, our knowledge would be far more limited in extent than it is. As for security, our knowledge rarely, if ever, escapes altogether the possibility of error. That human fallibility is pervasive, the history of science and individual experience readily attest. And as we often have no direct means of verifying how things stand, without an indirect, and therefore inferential, means of checking our theories, our grip on reality would be far less secure than it is. In at least these two ways, then—extent and security—our epistemic situation leaves us considerable room for improvement.

Second, we seek improvement in our epistemic situation. We desire to know, to understand, and, as Aristotle observed, we do so by nature.<sup>11</sup> One reason for this is intellectual curiosity or wonder. It gives us great delight to figure things out, to make discoveries, to enlarge our understanding of the world. Another, more practical and urgent reason is that we live in a changing and often dangerous world. If we do not make an effort to understand it so as to be able to predict events and thereby in some measure control or navigate around them, both the duration and quality of our lives may be seriously diminished.

These two features of our epistemic situation—recognition of specific deficiencies in the extent and security of our knowledge and a desire to rectify those deficiencies—give rise to inquiry.<sup>12</sup> To desire to know is to be on a quest for knowledge. It

of inferences that conform to one guiding principle”—and with “acritical inferences”—in which “we are conscious that a belief has been determined by another given belief, but are not conscious that it proceeds on any general principle” (*EP* 2.348).

<sup>8</sup>David Hume, *Enquiry Concerning Human Understanding*, 3rd ed., P. H. Nidditch and L. A. Selby-Bigge, eds. (Oxford UK: Clarendon Press, 1975), p. 8.

<sup>9</sup>Cf. *EP* 2.51: “Not only is our knowledge thus limited in scope [extent], but it is even more important that we should thoroughly realize that the very best of what we, humanly speaking, know, [*we know*] only in an uncertain and inexact way [security].”

<sup>10</sup>Peirce would, however, warn us against supposing that our *current* epistemic limitations are *permanent* ones. What is unknowable by us today may become accessible tomorrow. Cf. *EP* 2.188.

<sup>11</sup>Aristotle, *Metaphysics* I.1.980a22–23.

<sup>12</sup>Cf. *EP* 2.48–49: “The first thing that the Will to Learn supposes is a dissatisfaction with one’s present state of opinion. . . . The inductive method springs directly out of dissatisfaction with existing knowledge. The great rule of predestination which must guide it is as much as to say that an induction to be valid must

is to ask questions, to inquire. Inquiry is the search for answers to our questions. If our epistemic situation were perfect, lacking in neither extent nor security, inquiry would be unnecessary. And if we did not want to improve it, deliberate, controlled inquiry would not happen. Likewise for inference. If our epistemic situation were, like God's, perfect in extent and security, we would have no need of inference. And if we did not want to improve it, inferences (in the sense of conscious and controlled belief-forming cognitive events) would not happen; we would not try to extend our knowledge by exploring new conjectures and we would not care to secure our ideas against error by testing them.

Inference and inquiry are intimately related. Both arise in response to the same epistemic limitations and are part of our endeavor to overcome, to some degree, those limitations. But the connection goes deeper. Inquiry begins as a search for answers to questions. But questions have presuppositions. Every question is rooted in something that is already believed or supposed.<sup>13</sup> Moreover, inquiry ends when the questions are answered to the inquirer's satisfaction; ideally, with answers he can reasonably believe. Inquiry, then, begins with something believed or supposed and, if successful, ends with the reasonable formation of belief. So does inference. From believed or supposed premises a conclusion is inferred. Inquiry and inference are, therefore, correlative. To inquire is to ask a question with a view to obtaining a satisfactory answer. To infer is to arrive at an answer to a question by reasoning from the information in hand. The conclusion of every inference is, therefore, the answer to a question.<sup>14</sup> It is this connection—between inquiry as answer-seeking and inference as answer-yielding—that I now pursue.

### THE PROCESS OF INQUIRY

Dewey observed that “inquiry, in spite of the diverse subjects to which it applies, and the consequent diversity of its special techniques has a common structure or

be prompted by a definite doubt or at least an interrogation; and what is such an interrogation but first, a sense that we do not know something, second, a desire to know it, and third, an effort,—implying a willingness to labor,—for the sake of seeing how the truth may really be.”

<sup>13</sup>Douglas N. Walton, *Informal Logic: A Handbook for Critical Argumentation* (Cambridge UK: Cambridge Univ. Press, 1989), pp. 54–55. For example, yes/no questions ask which of a list of alternatives is true and presuppose, therefore, that one of the alternatives is true. In contrast, why-questions ask for an explanation of some state of affairs that is presupposed to obtain. In general, the very *act of asking* a genuine (i.e., non-rhetorical) question assumes that a satisfactory answer can in principle be had.

<sup>14</sup>Some clarification may be needed. First, questions may be answered by means other than inference. One such means is perception—wanting to know what time it is I glance at my wristwatch. Another is consulting a trusted authority—wanting to know what a word means, I consult a dictionary. Second, the questions to which our inferences yield answers need not be explicitly formulated, nor need we be conscious of the fact that in inferring we are answering a question. The extent to which questions are explicitly or consciously entertained is a matter of degree because consciousness (and control) are matters of degree (cf. *EP* 2.227). The more aware we are of what question we want to answer, the more control we can exercise in its answering, the better we are able to assess the adequacy of proposed answers, and the more fully inferential the answering process will be. The reason we are often not explicitly and consciously aware of the questions driving our inquiries is because it is of the nature of a question to direct attention *away* from itself and toward the answer sought. Bringing the questions themselves into focus requires self-reflectively questioning the question by considering the nature of the problem that we are trying to solve.

pattern.”<sup>15</sup> A brief survey of literature on problem-solving confirms this,<sup>16</sup> and parallel analyses of the process of inquiry are not hard to find.<sup>17</sup> For present purposes, the analyses of Peirce and Lonergan merit special attention. In his mature writings, Peirce repeatedly and explicitly associates deduction, induction, and abduction with the respective cognitive tasks to be performed at different stages in the process of inquiry. In contrast, Lonergan emphasizes the types of questions that dominate at different stages of inquiry. By integrating their analyses, I will show that Peirce’s three types of inference play three different roles in the process of inquiry in virtue of answering three different types of questions.

### *Peirce’s Theory of Inquiry*

Peirce has two complementary accounts of inquiry. The first is psychological in orientation. According to this account, inquiry arises out of a mental struggle to eliminate the irritation of doubt and attain the “fixation of belief.” The second is logical and methodological in orientation. According to this account, inquiry is a deliberate, controlled process of extending and securing our knowledge that is governed by considerations of economy and that involves an inferential triad of abduction, deduction, and induction. Both accounts deserve some comment.

*The Doubt-Belief Model.* In his famous 1877 essay “The Fixation of Belief,” Peirce writes: “The irritation of doubt causes a struggle to attain a state of belief. I shall term this struggle *inquiry*” (W 3.247). The terms “doubt” and “belief” are used here in a technical sense “to designate the starting of any question and the resolution of it,” respectively (W 3.261). The fundamental nature of a belief, for Peirce, is that of an habitual expectation of what *would happen if*. For example, to believe that something is hard is to expect, among other things, that it would resist being deformed were pressure applied to it. Because beliefs involve expectations, they can serve as rules for action. Hence, beliefs may be “distinguished by the different modes of action to which they give rise” (W 3.264). Thus, to believe that fire is hot is, in part, to be disposed to use fire to keep warm or cook food, should one so desire. Doubt normally arises when a belief-habit is upset by a surprising or unexpected experience, but it can also arise, notes Peirce, through “feigned hesitancy,” that is, through contemplating what would happen if hypothetical circumstances obtained (W 3.262).

<sup>15</sup>John Dewey, *Logic: The Theory of Inquiry* (Carbondale IL: Southern Illinois Univ. Press, 1991), p. 105. Antecedently, this may look implausible. There are so many different types of problems and different kinds of questions that one might doubt that any systematic unity can be found. I emphasize, however, that my focus is on specifically *epistemic* problems, those concerned with the extent and security of knowledge. Obviously, we do have other aims, *non-epistemic* ones, that compete with the epistemic aims of inquiry for our limited resources. The claim that there is a general pattern of inquiry should be restricted to cases in which epistemic aims dominate over other considerations and are deliberately and consciously pursued. Such is often, though not always, the case in theoretical disciplines like the sciences, mathematics, and philosophy.

<sup>16</sup>G. Polya, *How to Solve It: A New Aspect of Mathematical Method*, 2nd ed. (Princeton NJ: Princeton Univ. Press, 1957), pp. xvi–xvii; John R. Hayes, *The Complete Problem Solver* (Philadelphia PA: The Franklin Institute Press, 1981), pp. 2–3.

<sup>17</sup>For example, Karl Popper, *Objective Knowledge*, rev. ed (Oxford UK: Oxford Univ. Press, 1979), p. 243; Dewey, *Logic: The Theory of Inquiry*, chaps. 6 and 7; and Michael Polanyi, *Personal Knowledge* (Chicago IL: Univ. of Chicago Press, 1962), pp. 120–21.

*The Inferential Model.* According to Peirce, inquiry is a self-correcting process of investigation guided by a set of methodological norms falling under the rubric of what he calls the “economy of research” (*EP* 2.107–14). This process proceeds through an inferential triad of abduction, deduction, and induction. In formal terms, these may be compared as follows.<sup>18</sup>

<b>Abduction:</b>	<b>Deduction:</b>	<b>Induction:</b>
E	H	If H then C
<u>If H then E</u>	<u>If H then C</u>	<u>C</u>
H	C	H

But the form of each inference is subsidiary to its function in a process of inquiry. Abduction, deduction, and induction play specific roles in that process and apart from those roles have no legitimate application (*EP* 2.205). The role of abduction is *explanation*. Given a problem situation or explanandum E, we reason abductively to a hypothesis H that, if true, would explain or make sense of the situation: If H then E. The role of deduction is *explication*. Given hypothesis H we deductively derive consequences C that would follow if the hypothesis were true, If H then C. The role of induction is *evaluation*. Once we have traced out the consequences of a hypothesis, If H then C, and checked whether those consequences C obtain, we inductively assess the hypothesis in light of those results. In brief, abduction explains, deduction explicates, and induction evaluates:

Abduction is the process of forming an explanatory hypothesis. It is the only logical operation which introduces any new idea; for induction does nothing but determine a value and deduction merely evolves the necessary consequences of a pure hypothesis. (*EP* 2.216)

Observe that neither Deduction nor Induction contributes the smallest positive item to the final conclusion of the inquiry. They render the indefinite definite: Deduction Explicates; Induction evaluates: that is all. (*EP* 2.443)

### *Lonergan's Theory of Inquiry*

According to Lonergan, inquiry is driven by a “pure desire to know,” and it proceeds through the three stages of experience, understanding, and judgment, the transition between which is effected by a cognitive event he calls an “insight.” The pure desire

<sup>18</sup>Two comments on these diagrams: First, the deductive pattern is logically valid, as one would expect. The abductive and inductive patterns, however, are deductively invalid. This too is to be expected. As non-deductive modes of inference, the conclusion of each goes beyond what is given in the premises, which guarantees their invalidity. Second, as represented here, abduction and induction appear only trivially distinct, the only difference being the order of the premises. It must be kept in mind, however, that for Peirce form follows function. While the difference in the order of the abductive and inductive premises, as depicted here, is not formally significant, it is functionally significant and reflects the difference between *accommodating* old data and *predicting* new data; cf. Peter Lipton, *Inference to the Best Explanation*, 2nd ed. (London: Routledge, 2004), chap. 10. The importance of this distinction is reflected in Peirce's insistence on “predestination” in inductive reasoning (cf. *EP* 2.45).

to know is manifested in our spontaneous curiosity and wonder. Lonergan also calls it the “pure question”: “The primordial drive, then, is the pure question. It is prior to any insights, any concepts, any words, for insights, concepts, words, have to do with answers; and before we look for answers, we want them; such wanting is the pure question.”<sup>19</sup>

Lonergan’s first stage of inquiry, experience, begins with what is immediately present to consciousness, apart from any interpretation, recognition, or understanding of it.<sup>20</sup> When confronted with the data of experience, says Lonergan, we spontaneously desire to know what we are experiencing. We want to understand what is going on. Hence we are prompted to inquiry, to ask what Lonergan calls “questions for intelligence,” which he typifies with the Latin *quid est?* (what is it?).

In response to questions for intelligence, an *insight* may occur. It may be a “direct insight,” a provisional and normally partial grasp of the intelligibility immanent in one’s experience, or it may be an “inverse insight,” a provisional recognition of the absence of some expected intelligibility, of the random and the non-systematic as such. We become aware of the occurrence of a direct insight at the “ah-ha!” moment when “the light goes on” or one “puts two-and-two together” and, as William James might put it, the “blooming, buzzing confusion” of experience resolves into recognizable objects and intelligible patterns. Through direct insights one comes to *understand* the data of one’s experience as one did not before. Commonplace examples abound: Identifying the marks on a page as words and sentences, recognizing something in the distance, noticing a correlation between a patient’s symptoms and those associated with a particular disease, and so forth. In contrast, through inverse insights one comes to a provisional recognition that something does not make sense, that some putative intelligibility or pattern does not obtain—for example, noticing the apparent randomness of a sequence of numbers or letters. Whether direct or inverse, acts of insight move us from the level of mere experiencing to having a provisional understanding of experience.<sup>21</sup>

Lonergan’s second stage, the level of understanding, has to do with the accumulation, integration, systematization, and articulation of direct and inverse insights. Our first insights are often little more than vague ideas. But if we maintain focus on the problem, insights can accumulate and lead to higher-order insights in which we grasp connections among the contents of previous insights. As the process continues, a progressively sharper, more articulate understanding of what we initially grasped as though “through a glass darkly” gradually comes into view.

But the development of understanding, Lonergan insists, is not enough to satisfy the deepest exigencies of inquiry. The pure desire to know is not satisfied with merely a possible or plausible understanding of experience; we want that understanding

<sup>19</sup>Bernard Lonergan, *Insight: A Study of Human Understanding* (San Francisco CA: Harper & Row, 1957), p. 9.

<sup>20</sup>Lonergan was unacquainted with Peirce, so far as I am aware. Nevertheless, Lonergan’s notion of experience is rich enough to accommodate Peirce’s phenomenological categories of Firstness, Secondness, and Thirdness. Firstness is given in the sheer immediacy of experience; Secondness in its confrontational aspect (the “insistency” of the percept, as Peirce might say), and Thirdness in its intrinsic intelligibility.

<sup>21</sup>Lonergan, *Insight*, p. 88.

to be *true*. We want not just to enlarge the *extent* of our understanding, but also to *secure* ourselves against error. The third stage of inquiry, therefore, is the domain of critical rationality or *judgment*. Having arrived at provisional answers to questions for intelligence (*quid est?*), there arise “questions for reflection” (*an sit?*, Is it so?), the answers to which take the form of categorical judgments: “Yes, it is so” or “No, it is not.” The transition from understanding to judgment is effected by an insight—in this case a “reflective insight,” a grasp of the rational sufficiency or insufficiency of the evidence to warrant affirmation of the prospective judgment.<sup>22</sup> As Lonergan puts it, this amounts to a grasp of the “virtually unconditioned,” a recognition that the judgment’s truth conditions, the things that *would be the case if* our understanding were correct, are fulfilled.

### *Toward a Unified Account*

Comparing Lonergan’s and Peirce’s theories of inquiry reveals significant parallels. There is a Peircean analogue of Lonergan’s pure desire to know in the “fundamental and primary abduction,” the hypothesis that “the facts in hand admit of rationalization and of rationalization by us” (*EP* 2.107). For Peirce this is an *a priori* hope—we cannot prove at the outset that our efforts to understand and to know will meet with success—but without that hope the hard work of deliberate inquiry would never happen and the potential payoffs would be forever lost to us. In this vein, Peirce speaks of the “scientific man” as one who is driven by a pure desire to learn the truth (*EP* 2.130).

There is also a clear parallel between Peirce’s abductive and inductive inferences and Lonergan’s direct and reflective insights, respectively. Abductive inferences yield plausible explanations of puzzling phenomena, just as direct insights yield a provisional understanding of experience. Inductive inferences evaluate hypotheses and issue a pronouncement on their truth or falsity in the light of experimental testing, just as reflective insights result in a judgment of the adequacy or inadequacy of a provisional understanding. One difference is that Lonergan does not identify a specific type of insight corresponding to Peircean deduction. But this difference is more cosmetic than substantive. Deductive inference, for Peirce, is concerned with explication, the articulation and development of ideas, and that is exactly what Lonergan thinks goes on at the level of understanding.

We can now begin putting the pieces together toward a constructive synthesis of Peirce and Lonergan. If direct and reflective insights answer questions for intelligence and questions for reflection, respectively, and if abductive and inductive inferences correspond to direct and reflective insights, respectively, then abductive and inductive inferences answer different types of questions. And since inquiry is the search for answers to our questions and to infer is to arrive at an answer to a question by reasoning from the information in hand, this suggests that different kinds of inference answer different kinds of questions and that there are as many basic kinds of inference as there are basic kinds of questions asked in the process of inquiry. To verify this conjecture, we need to (1) analyze the process of inquiry

<sup>22</sup>Lonergan, *Insight*, p. 287.



by identifying the kinds of questions that naturally arise in it, and (2) establish a one-to-one correspondence between types of question and types of inference by showing how each type of inference answers its related question-type.

We can carry out this program by means of a Lonergan-style transcendental argument.<sup>23</sup> If a given episode of inquiry begins with a problem situation marking a particular deficiency in our knowledge, the end of that episode will come when the problem is solved and the deficiency rectified. What begins with uncertainty and ignorance ends with the confident judgment “S is P.” But what must occur in between? We can answer by reflecting on what is presupposed in making a reasonable judgment of fact. As to inquire is to ask a question, the judgment that terminates an episode of inquiry is the answer to a question. Hence, the judgment “S is P” is an answer to the question “Is S P?”. But if that answer is to be reasonable it must be based on sufficient evidence grasped as sufficient. If we had possessed sufficient evidence at the outset and if we had already grasped it as sufficient, inquiry on the matter would have been unnecessary. Since we are supposing that the judgment was reached via a process of inquiry, it must have been the case that at some earlier point there was a lack of sufficient evidence recognized as such. Hence, prior to the judgment, further evidence must have been sought, prompting the above question (“Is S P?”). But in order to know what evidence to look for, we must have had presumably reliable criteria for determining whether S is P. How do we identify appropriate criteria? Well, Peirce’s pragmatic maxim tells us that if we want to better understand what a concept means, we should ask what would we expect to be true *if* the concept applies. So, if we want to discover whether S is P we should ask the question “If S were P, what would follow?” But we cannot meaningfully ask and answer that question without already having at least a provisional understanding of both S and P. That is to say, we must already possess answers to questions such as: “What is S?” and “What is it to be P?” If our answers to those questions are to be more than mere stipulations or arbitrary guesses, and if they are to be grounded in the surprising experiences that prompted the episode of inquiry in the first place, then we must have an initial body of data to draw from, one that includes the given of experience and the given of already acquired belief-habits. We thus come to the starting point of inquiry in a given or presupposed body of data.

Reversing the order of analysis, we can discern six stages in the process of inquiry. First is a stage of *epistemic dissatisfaction*, where, against the backdrop of experience and expectation, some item stands out as problematic. Second is an *explanatory* stage. One struggles to make sense of the problem situation by asking questions like “What is it?” or “Why this rather than that?”—I call these *interpretive* or *understanding-seeking* questions. When such questions have been answered, at least provisionally, one has reached the third or *explicative* stage. Having grasped a possible solution to the problem, one faces the critical task of ascertaining whether the solution really works. To be tested, vague conceptions need to be explicated and made more precise, their consequences delineated so that they can be checked.

<sup>23</sup>My argument here parallels Lonergan, *Insight*, chap. 11.

This effort to clarify ideas involves asking questions like “If this were true, what would follow?”. For obvious reasons, I call those *conditional* questions. Having answered such questions one can proceed to the fourth or *experimental* stage of gathering further data and checking whether the predicted consequences of the idea obtain. Fifth is the *evaluative* stage of judging whether the proposed solution is correct in light of the experimental results. This involves answering a *categorical* question “Is it so?”. Sixth and finally, the result of the process is a stage of (relative) *epistemic satisfaction*, provided a positive evaluation is forthcoming at stage five. Otherwise, we are driven back to the drawing board, so to speak, and may have to come up with another explanation (stage two). In summary, the basic pattern of inquiry looks like this:

Epistemic dissatisfaction (problem situation)

Explanation—come up with a possible solution (answers interpretive question)

Explication—derive consequences (answers conditional question)

Experimentation—gather further information, run tests

Evaluation—assess truth/falsity in light of stage 4 (answers categorical question)

Epistemic satisfaction (if a positive evaluation at stage 5, otherwise, back to stage 2)

We see then that theoretical inquiry, when deliberately, conscientiously, and uninterruptedly pursued, is a problem-solving process having a recognizable structure consisting of six distinct stages. Corresponding to stages two, three, and five (explanation, explication, and evaluation) are three types of inference (abduction, deduction, and induction) that answer three types of question (interpretive, conditional, and categorical). Of these three triads, the connection between the last two—the three types of inference and the three types of questions—needs some elaboration, and so to that task I now turn.

## QUESTIONING AND INFERRING

In this section I look at the three types of questions that I have identified and show that each represents a distinct kind of interrogative intentionality and therefore anticipates a different kind of answer. I will begin with a rough linguistic description of each, and then refine those descriptions by examining the characteristic intentionality of which each type of question is the expression. Lastly, I will show how Peirce’s inferential triad matches up with the interrogative triad.

### *Preliminary Descriptions*

What I call *interpretive questions* (Lonergan’s questions for intelligence) emerge from our trying to understand or make sense of things. We typically begin these questions with one of the standard question-words: Why? What? How? etc. An unexpected event occurs. *Why?* I am served an unfamiliar dish. *What* is it? I see

a suspicious person across the way. *Who* might that be? I get lost. *Where* am I? A magician makes a rabbit appear. *How* did he do that?

*Conditional questions*, as the name connotes, have a hypothetical, if-then structure. We ask these when we want to explore the consequences of some state of affairs' obtaining or of some proposition's being true. Hence, we naturally express these sorts of questions using conditionals: *If* I were to mix these two chemicals, what would happen? *If* we raise the minimum wage, what effect will it have on our economy?

Finally, *categorical questions* are concerned with classification and typically expect a yes/no, true/false kind of answer. In English, these questions usually begin with a verb. *Is*  $\pi$  greater than, less than, or equal to 3.1416? *Is* war ever just (or not)? Whereas interpretive and conditional questions leave the range of possible answers open-ended, categorical questions start with a delimited set of two or more possible answers and seek to restrict it further.

### *The Descriptions Refined*

The above preliminary descriptions are, unfortunately, too crude to be of much use. The problem is that we cannot always tell what type of question is being asked, or even whether a question is being asked, simply by attending to syntax. Instead, we have to attend to the expression's use or function in a context. Thus, not all utterances having the surface grammatical form of a question express genuine questions. So-called "rhetorical" questions are a case in point. They look like questions but they are not because they do not have an interrogative function. Similarly, utterances that do not look like they express questions may in fact do so. For example, "You are going" looks like a statement of fact, but when spoken with a rising pitch on the last syllable it expresses the question "Are you going?" Similar comments apply to distinguishing between types of questions. It would be a naïve mistake to think that all question expressions that start with one of the standard question words express interpretive questions, or that all that are conditional in form express conditional questions, or that all that start with a verb are categorical questions. Counter-examples are easy to come by. For example, "Why are you here—to work or to play?" Superficially, this looks like it expresses an interpretive question since it starts with "why." But because it restricts the range of possible answers *in advance* it is actually a categorical question, namely, "Are you here to work or are you here to play?". Similarly, "If something is cold, white, and made of 6-pointed crystals, what is it?" looks like it expresses a conditional question, but because it is not asking for a consequence but rather for a unifying idea that makes sense of the details given in the antecedent, it actually expresses an interpretive question. In short, what matters for recognizing and classifying questions is not the grammatical form of their expression, but the *interrogative intentionality* behind it. On this point, consider the following distinction by John Bruin:

[T]he predicative question starts with the "name" and then proceeds to determine the "predicate." Typically, the possibilities open to a predicative question are clear: "What kind of flower is it—a rose or a poppy?" "What color is it—red or blue?" . . . The hermeneutical question, by contrast, proceeds the other way about. Starting with the predicate-clues

(—*is x*, —*is y*, —*is z*), it then looks for the “name,” or the answer, to the “riddle” “What is it?” (? *is x*, *y*, and *z*).<sup>24</sup>

What I call interpretive and categorical questions correspond to Bruin’s “hermeneutical” and “predicative” questions, respectively. When we ask an interpretive question, we seek to make sense of a puzzling situation or to solve a riddle, so to speak, by studying the available clues. We look for a suitable subject to which the available predicate-clues can be applied. The direction of thought is *retrospective*, from effect to cause, from what is conditioned to that which conditions. Thus, interpretive questions are asked with the aim of generating a range of *possible* solutions: What *might* this mean? How *might* we make sense of this? In contrast, when we ask a categorical question, we seek to render an *already identified* subject more determinate by assigning further predicates—true or false? black or white or gray? etc. The direction of thought is, for lack of a better word, *inspective*, from partially conditioned to further conditioned. Categorical or predicative questions are asked with the aim of *restricting* possibilities, of narrowing a set of pre-delimited possibilities down to what is *actually* the case. Finally, conditional questions posit a set of conditions (if . . .) and ask for the consequences (then . . .). Like interpretive questions and unlike categorical questions they are open-ended. “What follows?” has no pre-envisioned range or set of possible answers. Unlike both interpretive and categorical questions, they are not retrospective or inspective but forward-looking or *prospective*, from conditions to conditioned. Furthermore, whereas interpretive questions ask for explanatory *possibilities* and categorical questions ask which of a set of possibilities is *actual*, conditional questions ask what is *necessary* given the conditions. The following table, therefore, summarizes the distinctive intentionality of each type of question:

Question Type	Example	Intentionality	Temporality	Modality <sup>25</sup>
Interpretive	Why? What is it?	If ? then X	past—retrospective	possibility
Conditional	If this, then what?	If X then ?	future—prospective	necessity
Categorical	Is it this or that?	X? or Y?	present—inspective	actuality

### *Questioning and Inferring*

We ask questions in hopes of finding answers. Inferences are cognitive events whereby we arrive at answers to questions on the basis of the information in hand. As different types of questions anticipate different types of answers, so also there are different types of inferences by which we arrive at these answers:

<sup>24</sup>John Bruin, *Homo Interrogans: Questioning and the Intentional Structure of Cognition* (Ottawa, Ontario: Univ. of Ottawa Press, 2001), pp. 62–63.

<sup>25</sup>Cf. *EP* 2.216: “Deduction proves that something must be, Induction shows that something actually is operative, Abduction merely suggests that something may be.”

<b>Abduction:</b>	<b>Deduction:</b>	<b>Induction:</b>
E	H	Is H true?
Why E?	If H, then what?	If H then C
<u>If H then E</u>	<u>If H then C</u>	<u>C</u>
H	C	H

In an abductive inference, a surprising experience E prompts an interpretive question that expresses our desire to understand it. We retrodict from explanandum to a putative explanans, an hypothesis H that if true would explain E. In a deductive inference we start with a hypothesis H and unpack its significance by asking the conditional question: If H were true, what further consequences C would follow? In an inductive inference, we examine the consequences of a hypothesis to ascertain whether that hypothesis is true. In each case, the conclusion gives an answer to the question: Why E? H. If H, what follows? C. Is H true? Yes. H.

### CONCLUSION

I have argued that the function or purpose of inference consists in the answering of questions. But before questions can be answered, they must be asked. And thus it is inquiry, the asking of questions and the pursuit of their answers, that establishes the context within which inferences take place. Analysis of inquiry reveals a multi-stage process in which there is an exact correlation between three stages in that process (explanation, explication, evaluation), three kinds of inference (abduction, deduction, induction), and three kinds of questions (interpretive, conditional, categorical).

One result of this is a confirmation of Peirce's triadic categorization of inferences into abduction, deduction, and induction. The distinctness of each type of inference derives from the fact that each performs a different role in the process of inquiry and in so doing responds to a different sort of interrogative intentionality. This result yields a response to friends and critics of Peirce who have sought to collapse the abductive/inductive distinction. Thus, Gilbert Harman<sup>26</sup> and William Davis<sup>27</sup> have argued that inductive inferences are really just disguised abductions, whereas Richard Fumerton has argued that abductions are really just disguised inductions.<sup>28</sup> The rationale behind such reductions derives from the idea that logical *form* should be the primary principle of demarcation between types of inference. As my first set of logical diagrams suggested, the differences between abduction and induction are trivial from a purely formal perspective. But, as I have argued, it is the *function* that an inference has in a larger context of inquiry that is its *raison*

<sup>26</sup>Gilbert Harman, "Enumerative Induction as Inference to the Best Explanation," *Journal of Philosophy* 65 (1968): 529–32.

<sup>27</sup>William H. Davis, "Synthetic Knowledge as Abduction," *Southern Journal of Philosophy* 8 (1970): 37–43; *Peirce's Epistemology* (The Hague: Martinus Nijhoff, 1972).

<sup>28</sup>Richard Fumerton, "Skepticism and Reasoning to the Best Explanation" in *Philosophical Issues*, vol. 2: *Rationality in Epistemology*, ed. Enrique Villanueva (Atascadero CA: Ridgeview Publishing, 1992), pp. 149–69.

*d'être*. To conceptualize inferences along primarily formal lines is to present them statically as finished products rather than as the dynamic, intellectually transforming events that they are. Consequently, another important ramification of the functional, interrogative approach to understanding Peirce's inferential triad is that it helps us to recover a sense of what we are *doing* when we reason. If Peirce is right that logic is a normative science concerned with the rational principles of conscious and controlled thought, then the epistemic function, purpose, or role of inference has to stay at the center.<sup>29</sup>

<sup>29</sup>I wish to thank Neil Delaney, John Greco, and Tom Gollier for helpful comments on earlier versions of this paper.