# *Abducting Abduction: Dejá Vu One More Time?*

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**Abstract:**

Abduction, the overlooked dimension of the semiosic process, is with us in our everyday activities, whether we know it or not. Interrelated and intermeshed with practical, concrete consequences of the pragmatic maxim, both induction and deduction depend upon abduction, yet there is no fixed boundary between them. Rather, like the categories, abduction, induction and deduction incessantly find themselves in an interrelated swirl of interdependent interaction. The task is to strike a balance of the three processes.

**Keywords:** Abduction, Pragmatic Maxim, Rules, Overdetermination, Underdetermination, Categories

## Indeed, Is There a “Logic” of Discovery?

As far as Karl Popper is concerned, “the act of conceiving or inventing a theory, seems to me neither to call for logical analysis nor to be susceptible of it” (1959, p.20). Stumbling onto a new idea, concept, or theory is for Popper a chance affair, a shot in the dark. R. B. Braithwaite writes that scientific discovery is a historical problem involving “the individual psychology of thinking and the sociology of thought,” all of which is of little concern to the philosopher of science (1953, p.31). For Irving Copi, “Logic has nothing to say about the discovery of hypotheses; this process is more properly to be investigated by psychologists” (1953, p.49).

Those were the customary opinions around a half a century ago. During that time, there were a few voices in the wilderness, namely that of Norwood Hanson (1958, 1961, 1965, 1969), who held that the process of discovery cannot be divorced from the process of theory justification and validation. About a quarter of a century later the collection of studies edited by Thomas Nickles (1980a, 1980b) struck out on a daring path toward knowing as a process that begins with the inception of novel ideas. However, Charles S. Peirce’s concept of abduction, complementing the age-old deduction-induction pair of terms, continued to receive little attention outside K. T. Fann’s (1970) brief but intensive study of abduction and a few articles here and there. Whenever mention was made of abduction, it was usually within the context of scientific discovery and scientific method, regarding what was considered logico-rational discourse. There was hardly more than lip service toward abduction as a general creative process. A turnaround began with Umberto Eco and Thomas Sebeok’s collection entitled *The Sign of Three:*

*Dupin, Holmes, Peirce* (1983). Since that time abduction has occasionally found itself in a small corner of the spotlight in Peirce studies. But there has not been much more than that, outside a few articles here and there, namely, in Transactions of the Charles S. Peirce Society (especially Ayim, 1979; Pape, 1999; Wirth, 1999), some special issues of the journal VS (1978, 1980), and notably an issue of Uwe Wirth's online journal (http://www.rz.uni-frankfurt.de/~wirth/).

More disconcerting, abduction is usually placed within the context of the usual logic- and science-specific deductive-inductive concerns, with hardly more than passing mention of creativity. The literature usually has it that there are two ways of knowing what we think we know: deduction and induction. The classical example, of course, is the syllogism, where we find two premises consisting of facts assumed to be given, and a conclusion, that is derived from the premises. Descartes thought that by deduction, new truths could be forthcoming. Hard-nosed skeptics, in contrast, insisted that for every argument either or both of the initial premises might well be false. The conflict remains to this day in the form of rationalism and empiricism. Induction, the other way of knowing, are purportedly the way of science and common sense. Sherlock Holmes reasons, so the story usually goes, from "circumstantial evidence" or the particular facts, to a general grasp of what happened and why. Induction extrapolates from particulars to universals. The problem is that there is never any iron-clad guarantee that the well-meaning inductivist is right. Observing that a million crows are black is not necessarily any proof that the next crow won't be white. There is no logical necessity to an inductive conclusion, hence induction always seems less legitimate than deduction. Indeed, logic books often struggle between deduction, whose function is to clear up fallacies, and induction, that invariably falls into fallacies. Deduction is predicated on the presumed certainty that the world is consistently honest; induction is founded on the hope that the world is not inconsistently deceptive. During the turmoil, the idea of abduction is usually ignored.

In this paper I wish to attempt bringing about a modicum of balance to the deduction-induction antagonism by way of abduction – as if I were capable of the feat, which I am not, yet contemplation of the abductive act tends to instill one with perhaps undeserved confidence. At any rate, here goes.

## Where to Begin Where There is no Where?

Ideally, abduction should complement the chiefly voluntary and logico-rational manipulation – if not to say use and abuse – of signs in inductive and deductive

practices. Peirce himself takes deduction more or less in its traditional sense, properly lying within the domains of classical logic and mathematics. His induction, when included in the tripartite abduction-induction-deduction scheme, entails confirmation by putting deduced hypotheses to the test – whether in scientific activity or everyday living. The process of hypothesis formation is put into play by an individual act of abduction. Peirce considered “one of the worst of … confusions, as well as one of the commonest” that of “regarding abduction and induction taken together … as a simple argument” (CP 7.218).

Nevertheless, confusion of abduction and induction has been common. For example, Nelson Goodman, like the vast majority of scholars during the heyday of logical positivism and since, has essentially ignored abduction. James Harris (1992, p.60-61) writes, and justifiably so, that if we adopt Peirce’s distinction between abduction and induction, “then [Goodman’s] new riddle of induction is properly viewed as a riddle of abduction.” Hume’s dilemma was how to explain how what we have seen in the past can justify predictions regarding what we will see in the future. Goodman’s riddle rests on how hypotheses are chosen for confirmation in the first place: will it be “All emeralds are green” or “All emeralds are grue,” and why?

Properly separating Goodman from Hume, and roughly we have Peirce’s abduction-induction pair.

From within the symmetrical, atemporal, all-encompassing sphere of overdetermined, and often inconsistent possibilities, “All emeralds are green” and “All emeralds are grue” may be alike confirmable “by evidence statements describing the same observations” (Goodman 1965, p.74). All possibilities are there and waiting, as candidates for future abductive acts on more or less an equal and democratic basis. Once a selection has been made, the fee has been paid for entering the arena of underdetermined (deduced) concepts and theories, that, since they are never absolute nor absolutely complete, eventually they will suffer alterations, or their are discarded entirely. The overdetermined and the underdetermined, along with the temporal, asymmetrical, irreversible actualization of confirming instances (induction), make up the interminable game toward semiotic success. The problem is that success often appears to be available with a simple head fake and a dash around right end for a touchdown. This is because abductions are in many cases deceptively enticing and promising. They are somewhat remotely comparable to Goodman’s “similarities.” Goodman claims that similarities, the same as regularities, are where they happen to be found, and they can be found virtually anywhere and at anytime. Similarities, like generalities, however, are

no panacea. In fact, they are inevitably "wrong" (underdetermined) from one perspective or another, for they could have always been other than what they are (selected from the range of overdetermined possibilities). Peirce also recognized that:

> "There is no greater nor more frequent mistake in practical logic than to suppose that things which resemble one another strongly in some respects are any the more likely for that to be alike in others.... The truth is, that any two things resemble one another just as strongly as any two others, if recondite resemblances are admitted." (CP 2.634)

The ultimate implications of Peirce's "practical logic" are no less radical than Goodman's comparable notion of similarity regarding his "nominalism." If virtually any and all resemblances, even the most blatant and the most recondite, stand a gaming chance of gaining entrance into the "semiotically real" (of Seconds) from a virtually aleatory background (of overdetermined Firstness) – an element of which is present in even the most deterministic of worlds, according to Peirce – then there is no all-or-nothing method for determining before hand whether "All emeralds are green" or "All emeralds are grue" – or any other combination of likely candidates – will make the starting lineup. Neither possibility is necessarily any more likely or less likely than the other. But abductive intuition (literally, instinct, Peirce occasionally called it) can at least give the vague promise of making it so. What is certain, following what Peirce calls the "rule of predesignation," is that:

> "When we take all the characters into account, any pair of objects resemble one another in just as many particulars as any other pair. If we limit ourselves to such characters as have for us any importance, interest, or obviousness, then a synthetic conclusion may be drawn, but only on condition that the specimens by which we judge have been taken at random from the class in regard to which we are to form a judgment, and not selected as belonging to any sub-class. The induction only has its full force when the character concerned has been designated before examining the sample." (CP 6.413)

So an abduction (conjecture, guess, hypothesis from overdetermined possibilities) precedes a deduction (formal statement of an underdetermined hypothesis), and only then do successive confirmatory acts (the inductive process) follow. A conjecture must be made as to whether emeralds are "green" or "grue" before there can be either a deduction regarding particular empirical grasps and the hypothesis following from them or an inductive process of confirmation. Regarding the ensuing confirmatory acts, Peirce gives the following example:

> "A chemist notices a surprising phenomenon. Now if he has a high admiration of Mill's Logic,... he must work on the principle that, under precisely the same circumstances, like phenomena are

> produced. Why does he then not note that this phenomenon was produced on such a day of the week, the planets presenting a certain configuration, his daughter having on a blue dress, he having dreamed of a white horse the night before, the milkman having been late that morning, and so on? The answer will be that in early days chemists did use to attend to some such circumstances, but that they have learned better." (CP:5.591)

The "surprising phenomenon" can lead to a conjecture, which then spills into a hypothesis, and confirmatory acts ensue. But if the phenomenon of each and every confirmation is to be a truly legitimate repetition, then there must be sameness or at least resemblance of every aspect of that phenomenon when properly contextualized, down to the apparently most insignificant details.

This becomes an impossibly drawn out task in Peirce's example, it would appear. Obviously, there must be a selection and a Goodmanian projection, which is in its initial stages a matter of abduction, not induction. Assuming "All emeralds are grue" might have been at some time in the past abductively selected by some Grueworlder. Then eventually, we must suppose, it would have come in conflict with experience – at least for Ourworlder – and replaced by the projected alternative "All emeralds are green." In other words, the "grue-green" dilemma regarding the "semiotically real" world of actualized signs is a matter of asymmetry, temporality, and irreversibility. These characteristics render the dilemma relevant to the arena of underdetermination, since an unexpected and contradictory event had called for a hypothesis's replacement by another one, thus testifying to the incompleteness of the conceptual scheme within which that hypothesis had dwelled. They also bear testimony at least indirectly to the utter vagueness of the arena of overdetermination, of pure possibilities without anything having been actualized. In the final analysis, the abduction-induction-deduction process, in conjunction with Peirce's "pragmatic maxim" (briefly discussed below), does not aid and abet that oversimplified image of pragmatism in terms of "truth" as whatever happens to work or whatever happens to be in style.

## The Pragmatic Maxim's Role in Abduction, and Other Uncertainties

Peirce's pragmatism remains attuned to the future, to the general thrust of the entire community of dialogic semiotic agents. It is not simply a matter of what surprising turn of events happens to pop up in the here, now (abduction, Firstness), or what has happened in the past and how it predicts the future (induction, Secondness), but, in addition, how our conception and hence perception of signs will fare in the future as a consequence of signs present and signs past (Deduction, Thirdness).

Deduction occurs as if within some atemporal setting. It is knowing what could be the case, if certain conditions were to inhere. Induction is the accumulation, within time, of knowing what is, according to the particular preconceptions, predispositions and proclivities, and whims and wishes, of the sign maker and taker. Abduction is the timeless “flash” of knowing that which might possibly be, with no guarantees that this is so.

Abduction, along with induction and deduction, comes into play when Peirce’s “pragmatic maxim” is put to use. And, I would respectfully suggest, the maxim plays a role in as facets of semiosis, whether we are speaking of science, technology, the arts and humanities, or the coming and going of everyday life. (This, I must add, goes against the grain of the customary “cognitive” or “conceptual” interpretation of the maxim, as exemplified in Nesher, 1983, 1990.) In one of Peirce’s rendition, which is the most commonly cited, we have the following:

> “Consider what effects, that might conceivably have practical bearings, we conceive the object of our conception to have. Then our conception of these effects is the whole of our conception of the object.” (CP 5.402).

Notice how a combination of Firstness, Secondness, and Thirdness is implied in the maxim. We are asked to consider (Thirdness) the practical bearings of the effects (Secondness) that whatever is under consideration might conceivably have (Firstness). We have what we conceive would be or could be or should result if the perceived world were of such-and-such a nature, according to what we imagine might possibly be the case. But since what emerges out of our imaginative faculties is not only unpredictable but virtually without definite limits, the nature of what we would expect to ensue according to the myriad ways our world could be perceived and conceived would be equally unlimited, given all possible times and places, here and there and in the past, present, and future. The maxim, in this regard, plays on our imagining what might possibly be the case in one of an unlimited number of contexts. So there can be no closure, since tomorrow might usher in some unforeseen possibilities of imagination that might end in new probabilities (of Thirdness) of actualization in the world (of Secondness).

Abduction, at least, is a way of knowing what might be possible, and once knowing (and meaning) in the active sense enters the scene, there is attention toward entrenchment and habituation of that knowing. But since abduction is an ongoing process and never entirely absent, whatever codes or rules or modes of action are developed within a particular society, the possibility always exist for those codes, rules, or modes of action

to be subverted in one form or another, indeed, in virtually an infinity of ways. In this sense, it behooves us briefly to lend an ear to Ludwig Wittgenstein, regarding rules, who offers the following notorious opinion on rule following:

> "This was our paradox: no course of action could be determined by the rule, because every course of action can be made out to accord with the rule." (Wittgenstein 1953, §201).

Much controversial ink has been shed over the pros and cons, the virtues and vicissitudes, of Wittgenstein's so-called paradox – indeed, not a small number of observers consider it not a paradox, but merely a dilemma, over which we really need not lose any sleep. By no means do I wish to enter into this debate. Rather, the relevance of Wittgenstein's problem in regard to this inquiry bears on its implication of infinity.

How does infinity enter into the equation? It doesn't really enter, for it was there all along, that is, in the beginning, with Peirce's notion of continuity, what he calls the "book of assertions," the indeterminable range of possibilities within Firstness. Or better put, from what Peirce calls the "nothingness" (the unbroken, faceless, emptiness continuum) prior to the becoming of anything at all there appears a "point," and from the solitary "point" an infinity of "points" can be engendered to compose a "line," from an infinity of "lines" a "plane" begins its becoming, from an infinity of "planes" a "cube" begins emerging, and from an infinity of "cubes" a "hypercube" begins the process of its becoming. This process is initially sensed in Peirce's marring of the continuum. A line, as metaphorical of this continuum, he writes, "contains no points until the continuity is broken by marking the points. In accordance with this it seems necessary to say that a continuum, where it is continuous and unbroken, contains no definite parts; that its parts are created in the act of defining them and the precise definition of them breaks the continuity" (CP:6.168). This primordial continuum, "is a collection of so vast a multitude that in the whole universe of (overdetermined) possibilities there is not room for them to retain their distinct identities; but they become welded into one another.

Thus, the continuum is "all that is possible, in what ever dimension it be continuous" (NEM 4.343). Where is the point to be placed that disrupts the continuum? Peirce offers the answer. There is "a possible, or potential, point-place wherever a point might be placed; but that which only may be is necessarily thereby indefinite, and as such, and in so far, and in those respects, as it is such, it is not subject to the principle of contradiction" (CP:6.182). It is not subject to the principle of contradiction? Now how can this be? If in a zone subject to our contemplation there is "green" and "not-green" (or perhaps "grue"), then there must be an imaginary dividing line between what is and

what is not. So, “what is the color of the dividing line; is it green or not? I should say that it is both green and not. ŒBut that violates the principle of contradiction, without which there can be no sense in anything. Not at all; the principle of contradiction doesn’t apply to possibilities. Possibly I shall vote for Roosevelt; possibly not. Geometrical limits are mere possibilities” (NEM 2.531). In an alternative to this “thought experiment,” Peirce asks us to imagine he draws a chalk line on a blackboard. Then he writes that “the only line [that] is there is the line which forms the limit between the black surface and the white surface…. The boundary between the black and white is neither black, nor white, nor neither, nor both. It is the pairedness of the two. It is for the white the active Secondness of the black; for the black the active Secondness of the white” (CP 6.203). In the first case we have a rape of the principle of contradiction; in the second case we have a rape of the excluded-middle principle. Where is the logic in all this? Is there no order in Peirce’s concept of the continuum? A turn to meaning might be helpful.

## The Message Masks the Meaning

Meaning, which, as we shall see, is impossible without abduction, iconicity, Firstness – the quality of sensations, corporeal feels, inclinations, moods and modes.

Ian Hacking (1993) gives account of Saul Kripke’s (1982) correlating Goodman with Wittgenstein’s skeptical problem. Kripke suggests that “grue” can be addressed not to induction but most properly to meaning. The question would not be “Why not predict that grass, which has been grue in the past, will be grue in the future?” but rather, the Wittgensteinian question “Who is to say that in the past I did not mean grue by Œgreen, so that now I should call the sky, not the grass, Œgreen?” (Kripke 1982, p.58). In other words, in the past I called emeralds “green,” but meant “grue,” and now I continue to call them “green,” but I actually mean “bleen” (in English, “blue”). And I now call the sky “blue,” but actually mean “green” (that is, “grue”). Hacking points out that while Goodman’s problem is outer directed with respect to what the community thinks and says, Kripke’s is inner directed: what I think and say. In this sense, his question becomes: Why do I call the sky “blue” and grass “green” when actually I mean “green” (“grue”) and “blue” (“bleen”) respectively? To be accepted by my peers or to impress my students? To save face? To avoid conflict? To keep on the good side of my superiors? To impress an attractive colleague? To keep a good Rortyan conversation going? Or simply to deceive my associates in my effort to play a good con game? Possibly any of the above, one would suspect, and there is an indefinite number of other reasons to boot,

that is, according to Kripke’s inner directed, rather solipsistic, rendition of Goodman.

If we take Goodman’s original use of his riddle into full account, as does Hacking, then the entire community comes into the picture. As such, the question becomes: Would the majority or perhaps the entirety of the community to which I belong carry on the way I do? If each individual of a particular community were in step to the tune of the community’s band, it would be as if the tacit assumption on the part of the community as a collection of individual might be, as we saw above:

Who is to say that in the past we did not all mean “grue” by “green” – even though we knew better – and none of us imagined that everybody else actually meant “grue” by “green”?

We, as members of the community, could all be speaking out of the wrong side of our mouth for the sake of maintaining lines of communication intact without knowing that everyone else was doing the same. The so-called “charity principle” would operate in a perverse sort of way. Or better, it would be reduced to shambles insofar as nobody would be extending charity in good faith, but illicitly and for personal reasons.

This would be a world in which everybody lies, but lies in basically the same way, hence the collection of lies becomes a strange form of “truth.” It would also play havoc with John Searle’s well-intentioned interlocutors, Richard Rorty’s conversation would soon fall into chaos, and any form of a coherent and congenial community could hardly survive. What’s more, if we applied the bizarre dialogic interaction of this community of prevaricators to the “pragmatic maxim,” what one person reported would be the opposite of what she actually perceived and conceived. The “maxim” would turn against itself, leading to individual or collective error rather than wisdom, inauthentic signifying acts rather than genuine meaning. Given the above on the overdetermination-underdetermination pair and all its ramifications, there would be no predetermined or predeterminable method at all for knowing whether the community is progressing or retrogressing along its arduous push toward the goal-line of knowledge. Any smug confidence that what is known is knowledge rather than delusion would be itself more likely than not delusory.

Ultimately, the problem with meaning is not in its proof but in its taste. Quite simply, if it goes untasted, virtually anything may be capable of going as a proof, and if virtually anything can be a proof, then whatever the taste may prove, the proof will more often than not be little more than superfluous. I allude to the inextricability, in good semiotic practices, of either the representamen, semiotic object, or interpretant of the sign, and

of either Firstness, Secondness, or Thirdness, from the entire tripod of interrelations. The thorn in the side of meaning is that most popular accounts of the "grue-green" dilemma highlight either one or two legs of the tripod at the expense of the other(s). On the one hand, Goodman's riddle focuses on projection of predicates on things, thereby bringing about entrenchment, which is not a matter of "truth" or even meaning, per se, but of linguistic practice. On the other hand, Kripke's Goodman raises the question of meaning, if not exactly "truth," in addition to induction. Goodman evokes an attitude focusing more on actuals (Seconds), how they are most appropriately to be taken, once seen, and most specifically, how they should be clothed in linguistic garb (Thirds). Kripke's Goodman takes actuals in his stride as a matter of course; of more focal interest is the range of possibles (Firsts), and how, in their interaction with those actuals, they can in the future potentially give rise to alternatives (as Thirds) to the conventions that be. That is one difference between Goodman's "true grue" and Kripke's "Goodman's grue." Another important difference is that of "outer" directedness and "inner" directedness. Kripke, following Wittgenstein on rules, remains tied to consideration of thought-signs – in contrast to Goodman's emphasis on sign-events – of the mathematical sort, which are in this sense quite commensurate with Peirce's consideration of mathematics, fictions, dreams, and hallucination (Dozoretz, 1979).

Speaking of Peirce, where he stands out most briskly when placed alongside the Goodman-Kripke pair rests in his refusal to eschew indexicality, and especially iconicity, from the entire picture: he by no means remained inextricably tied to language (or symbols) and language alone. Peirce stressed long and hard that there is an iconic relation between the semiotic object that gives rise to an abduction and its attendant hypothesis, on the one hand, and that semiotic object as it is actually perceived, on the other. This relation is that of analogy or resemblance, proper to iconicity. Peirce offers the example of the similarity between the image of an ellipse and the data concerning the longitudes and latitudes of the revolution of Mars about the sun that allowed Kepler to draw up his abductive inference (CP:2.707). As a result of this abduction, a hypothesis was formulated, it conformed to the observations, and a new theory saw the light of day. As a consequence, the statement "The orbit is elliptical," or "Emeralds are green (or grue)," includes a predicate, or icon, as well as a subject, or index, as integral parts of the sentence (symbol). This is, of course, most proper to what is called first-order logic. But since signs are incessantly in the process of becoming signs and building upon other signs, the most complex of them possess the capacity to function as icons, that is, as conglomerate signs taken as complex, nonlinear wholes – Hamlet, Don Quixote, space as homogeneous and infinitely extended, the universe as a machine, God

as love, and other sign corpora taken as self-contained, self-sufficient wholes. This nonlinear, complex nature of sign conglomerates applies to a greater or lesser degree, I would suggest, to whatever collection of signs might be available within a given cultural mileiu.

So, what about the rape of the principles of contradiction and excluded-middle suggested by Peirce's quotation mention of which I concluded the previous section? If Firstness or iconicity can contain, within itself, conglomerate signs that make up self-contained, self-sufficient, self-reflexive wholes, then it is certainly overdetermined, and it sports any number of inconsistent possibilities. And if many of those signs making up the conglomerates are symbols – language – then whatever concept or theory they profess today may be gone tomorrow with the emergence of some other concept or theory between them and their opposites, what they are not.

Thus we are in the genuine domain of semiosis, which includes the full range of sign interactivity.

## The Way of All Signs?

Semiosis begins, with the qualisign, iconicity at its barest. If in the beginning was the word, that word, as a solitary evocation, was not yet a legitimate symbol: it needed interrelationships with other symbols and other signs before it could take on the status of a full-blown symbolic sign. Neither was it an index before its properly coming into relation with some "semiotic object" or other.

In view of previous sections, initially a sign is a sign of and by abductive inference: it often comes as the result of a surprise, for its signness emerges where and when there was as yet no indication of signhood for some semiotic agent in some respect or capacity. At this rudimentary stage it is the ultimate in autonomy, self-containment, self-reflexivity, harmony, coherence. In other words, the sign is a mere sensation (First), then it is acknowledged as something other "out there" or "in here" (Second), and finally a surprise is registered in consciousness (as a Third), because it appears that there is something rather than nothing and that this something is not what it would ordinarily be. Smugly confident of its ability to stand on its own (as qualisign), since it knows of no otherness (as sinsign), an initial sign – which is not yet a fully developed sign (as legisign) – begins by re-iterating itself, and in this act it can then relate in good semiosic fashion to some other.

But all this most likely remains aggravatingly obscure. Consider, then, an example. In

line with abductive activity, suppose at a particular juncture in your life the surprising event A occurs. Then you notice that if A, then there is the possibility of B. And as a consequence you draw up the tenderly fallible conjecture (abduction): if A, then there are prima facie grounds for assuming that B. In case B is related to A by mere resemblance, you have no more than a vague sense of iconicity. If the relation is from A to B in terms of some space-time connection, indexicality enters your semiosic activity, and you can now begin the route to cumulative inductive practices. And if B enjoys a place in the conventions of some community of semiotic agents, then in all likelihood you will be able to relate it deductively to A by way of symbolicity (natural language), whether in "inner" or some form of "outer" dialogic exchange.

Of course the mind would ordinarily prefer to avoid surprises, except perhaps in play. The game of life is serious business, and, according to Peirce, it entails incessant acts of abduction, induction, and deduction. Without these acts, there would hardly be any life at all, which is, precisely, the unfolding of possibilities actualized and congealed into habits that constantly push the process along. During the course of events, vague possibilities (as Firsts) eventually take on breadth to become generalities (as Thirds). In other words, juxtaposed and often inconsistent signs are selected, actualized (into Seconds), and brought into relation with other signs to engender perpetually incomplete modes of mind and of action. This process, I must emphasize, begins with abduction, the only "creative act of mind" (CP:2.624), the "operation which introduces any new idea," for induction "does nothing but determine a value, and deduction merely evolves the necessary consequences of pure hypothesis" (CP:5.171). An abductive insight is the mere suggestion of learnability (Firstness), which, when invested with a hypothesis, is tested for its accountability (Secondness). If things go according to the best of expectations, then the mind is on its way toward knowing (Thirdness) something it knew not.

In sum, then, with respect to the three forms of inference, (1) abduction is the process whereby sensations become welded together ultimately to form a general idea, (2) induction entails habit formation whereby sensations as they are related to similar events (reaction on the part of some other) are combined into a general idea, and (3) deduction is the process by which a habit, as the result of abductive and inductive processes, becomes part of everyday conduct (CP:6.144-46). It has become quite apparent that these processes tend to gravitate from vagueness to generality.

Incorporating mind and body into the equation, in deduction the mind follows habits, usually according to pathways of least resistance and by virtue of which a general "idea"

suggests some action. But this "idea" (Thirdness) is not strictly mental, disembodied, abstract, and autonomous of the world: it emerges as the result of a process given a particular direction by some sensation (Firstness), and the sensation was followed by some reaction (Secondness) from some other, whether of the physical world, the community, or the self's own "inner" other. The move from sensation to reaction to idea to action is not marked by ruptures, but rather, it is continuous. Corporeal capacities and tendencies merge into incorporeal capacities and tendencies, and vice versa, ultimately to become one undivided whole. Along these lines, Peirce writes in his usual intriguing but obscure manner, with uncanny allusions and bizarre associations, that the way "the hind legs of a frog, separated from the rest of the body, reason," is "when you pinch them. It is the lowest form of psychical manifestation" (CP 6.144).

There is no "I think, therefore I am" here, but merely the mind of some rather vague "I think" flowing along in concert with – though at times dragged along by – the body, and the self of "I am" in incessant dialogue – whether amiable or agonistic – with its other self, its social other, and its physically "real" other. There is no "I respond to stimuli, therefore I think I think," but mind orchestrating – though often unwittingly playing second fiddle to – the body's comings and goings. In this manner, speaking of "mind" and "idea" in the same breath as the impulsive jerks of severed frog's legs is not exactly epistemological heresy. What the frog legs do is fundamentally what we do, the difference being that for him, the body, whether whole or dismembered, can hardly be budged from center stage, while our mind often deludes itself into thinking it has taken over the leading role, and the body is merely along for the ride. However, the mind is not as paramount as we would like to think.

I bring up abduction-induction-deduction triad in order briefly to illustrate the importance of all forms of Firstness to the flux of semiosis. All concepts, as generalities, are invariable incomplete, thus, as mentioned above, they are subject to further amendments or deletions, or they may simply be discarded if proved inadequate. This nature of concepts and so-called conceptual schemes can by no stretch of the imagination be divorced from vagueness, which liberally allows for polysemy, plurivocity, through metaphors and other rhetorical tropes. While by their very nature they embody inconsistency, these tropes are not therefore rendered meaningless, nonsensical, or "false." They are not mere place settings or hors d'oeuvres, but part of the main course. In this sense, iconicity lies embedded at the heart of things. If we can talk of meaning at all, it is due to this centrality of iconicity, composed of images, schemes (Peirce's diagrams), and metaphors. This centrality is germane to the ways of

corporeal sensing and feeling as precursors to thoughts, concepts, and habits of mind and action. Linguistic or propositional knowing is possible solely as an outgrowth of nonlinguistic or nonpropositional processes. In other words, in light of previous arguments, symbolicity depends upon iconicity and indexicality for its very sustenance, Thirdness is made possible by the prior development of Firstness and Secondness, and legisigns owe their very existence to qualisigns and sinsigns. Ultimately, qualisigns and icons themselves depend for their existence on imagination. From imagination, sense is made of experience, which renders signs learnable in the first place. Imagination affords the tools for making semiotic worlds and giving account of them, and it gives rise to the ways of reasoning toward which knowledge of signs may be forthcoming. In fact, styles of reasoning themselves depend upon imagination, Firstness, which is categorically ignored by "objectivist" philosophy.

If meaning there must be, then, it emerges from Firstness and encompasses the likes of unicorn images, unicorn schemes, and unicorn thought-signs, just as much as grue/green emeralds as images, schemes, and concepts. Grue and green as predicates all constantly collude, collide, collaborate, and conspire to bring about engenderment of meaning on the part of their respective semiotic agents and according to whatever contexts and conditions that happen to emerge at a particular space-time juncture. Meaning consists in the relations emerging during sign engenderment and interpretation. It is not found in the relations between words and their referents, but first and foremost in relations of iconicity and indexicality, in feeling "in here" and sign-events either "in here" or "out there" before there are any thought-signs. We would like to think we are rational animals, capable willfully of generating the thought-signs that most effectively give our lives order and purpose. But before we are rational animals, we are rational animals. Our styles of reasoning are embodied in our cultural patterns and propensities, our embedded habits and tacit comings and goings.

Consequently, these styles of reasoning enable us to fabricate our worlds according to pathways of least resistance (the demands of Secondness), culturally inculcated imperatives (the necessities of Thirdness), and private idiosyncrasies, whims, and wishes (the desires of Firstness). The concrete "reasoning" of heart, soul, stomach, and even – and perhaps most emphatically – groin cannot be divorced from the abstract "reasoning" of mind. Feeling and sensing, and contact with hard core physical "reality" cannot but play a necessary part in the ethereal confines of intellection. Body and mind, subject and object, individual and community, nature and culture, are inextricably mixed. Abduction, I hardly need write at this point, makes up the heart and soul of this

entire semiosic process. Which brings up the question …

## Can/Should Abduction be Subdivided?

Helmut Pape (1999) argues that abduction, in keeping with Peirce’s triadomania, can be subdivided into (1) a theory of plausibility, once an unexplained surprise is registered over what one expected to occur but did not occur, (2) a logic of discovery, of creating new hypotheses, and (3) a logic of hypothesis preference, of selecting and justifying the choice of one hypothesis over others. The problem with Peirce, Pape writes, is that he conflated (2) and (3), and indeed, (3) is occasionally merged with (1). Peirce, in other words, failed to make the proper distinctions in his account of the abductive process.

Yes, we must make the proper distinctions, above all else. But is that really the spirit of the abductive process? If abduction is more of the nature of Firstness than the other categories, if induction is a matter chiefly of Secondness, and if deduction is most properly aligned with Thirdness – though we must keep in mind that there are no “proper distinctions” here – should not be process of abduction be deemed vague? If so, must should we really press for “proper distinctions”? My inclination would be to say no. This is by no means to say I disagree entirely with Pape. His article, “Abduction and the Topology of Human Condition,” hits the mark dead center, I believe, with respect to his allusion to topology. Pape writes:

> In the metaphysics of mind we distinguish three categorical types of elements of experience in all dimensions of mental activity: Whatever else there is, there are always monadic qualities of feelings or qualia, dyadic sensation of reactions, namely perception and volition, and triadic general conceptions – mental habits manifest in concept, thoughts and reasonings – habits relating elements of experience to one another. Dyadic and triadic elements are relational and can be analyzed on the sequentialist model. But at first glance it may seem that the monadic states of consciousness, which is called “quale consciousness”, has no connection with it, because this aspect of consciousness is logical unrelated. (1999, p.254)

Pape goes on to point out that qualia, as Firstness, are inaccessible to conscious awareness. Consciousness enters only after the emergence of qualia, when the subject can be – albeit artificially, in the Cartesian sense – distinguished from the object or sign, and relations of Secondness and then Thirdness enter the scene. Yet, it is important to bear in mind that qualia form the beginning of the abductive process. There is an image, that, when registered in consciousness, appears as something other than what was expected, and a surprise ensues. Then the image interrelates in the mind with past images and by mediation of Thirdness, a possible account for the unexpected

occurrence emerges.

The important point is that the process begins with an image: not ideas or thoughts, not concepts or meaning, not a lot of verbiage going on, but a merely humble image, no more and no less. The image comes "like a flash" (CP 5.181). It is there, and either satisfies expectations or comes as a surprise, and if a surprise, then a possible reason for the surprise appears as another image. This image can be virtually any happening in everyday life. Peirce gives this example:

> "I see an azalea in full bloom. No, no! I do not see that; though that is the only way I can describe what I see. That is a proposition, a sentence, a fact; but what I perceive is not proposition, sentence, fact, but only an image, which I make intelligible in part by means of a statement of fact. The statement is abstract; but what I see is concrete. I perform an abduction when I so much as express in a sentence anything I see." (MS: 692).

Abduction begins with an image, and the process goes on, as the image is set apart from the imager and the seen or the imaged as something other than the imager's self, then it is set apart from other objects in its vicinity and it is related to a general class of objects belonging to the same species and then a word appears, then a sentence, and then, if necessary, and entire text specifying the object, the class to which it belongs, its properties and characteristics, and so on.

The sign began with the most concrete of concretes, in vagueness and the overdetermination of virtually indefinite possibilities for sign development and ended in language, generalities of the most general sense, and the underdetermination of virtually indefinite possibilities for alternative conceptions of the object and class of objects in question. Pape's subdivision of abduction, it would appear, bears a further look.

## From the Borges Point of View

I turn to that paradoxmonger par excellence, Argentine writer Jorge Luis Borges, for my examples. First, the inhabitants of Tlön, of "Tlön, Uqbar, Orbis Tertius" (Borges, 1962), are inveterate idealist. Whatever they perceive they bring into the world by their act of perception. In other words, the Tlönians are idealists in the Berkelean sense. "Existence" begins with the postulate that the universe has no materiality and is nothing more than a projection of the subjective mind.

Hence there are no nouns on Tlön, only verbs and adjectives. Since "reality" is wholly mental, there can be no legitimate science except psychology. Nor is there any

consciousness of cause and effect, for everything created by the mind is mere association of ideas. Furthermore, every mental state is irreducible. If a given mental state is named, it is automatically falsified because all taxonomies are ephemeral and arbitrary: particulars are here now and gone in the next instant. In other words the Tlönians are mental nominalists. Whatever they wish their world to be, it is just that, for the moment. Some prisoners were sent out to dig in some archaeological findings. They produced nothing at first for they didn't know what to look for. Then, after they were given an archaeologist's imaginary depiction of what should be found at the site, they successfully disinterred what was expected of them.

Physicist James Jeans (1930, p.156) once remarked that the universe of relativity and quantum theory is regarded as a Great Thought in contrast to the universe of classical physicist, considered a Great Machine. The Tlönians considered thought to be synonymous with "reality." The mind, each mind, creates its own taxonomy, its own world. A Tlönian heresiarch of the eleventh century devised the scandalous sophism of nine copper coins:

> On Tuesday, X crosses a deserted road and loses nine copper coins. On Thursday, Y finds in the road four coins, somewhat rusted by Wednesday's rain. On Friday, Z discovers three coins in the road. On Friday morning, X finds two coins in the corridor of his house. The heresiarch would deduce from this story the reality – i.e. the continuity – of the nine coins which were recovered. It is absurd (he affirmed) to imagine that four of the coins have not existed between Tuesday and Thursday, three between Tuesday and Friday afternoon, two between Tuesday and Friday morning. It is logical to think that they have existed – at least in some secret way, hidden from the comprehension of men – at every moment of those three periods. (Borges, 1962, p.11)

Defenders of common sense maintained that this paradoxical anecdote was a verbal fallacy lacking in rigorous thought. The verbs "find" and "lose," they claimed, were used illegitimately. The coins supposedly having existed from the instant they were lost to the moment of their rediscovery would imply their continuous existence – the view of classical Western science – which was intuitively impossible for the Tlönians. They believed the coins ceased to exist once they were lost – i.e. unperceived – and popped into existence upon their being found. To repeat, idealism ruled, and the furniture of Tlön was presumably discontinuous: being was only upon being perceived. Or, in the quantum theoretical sense, a set of "superposed" waves is actualized into one of a number of probable events upon interaction with a knowing subject.

Moreover, we have here, Borges tells us, the Tlönian equivalent in the heresiarch's tale of Zeno's arrow paradox (which is actually the inverse of our Zeno). Is the arrow

stationary during each increment of time and space or not, and is there or is there not any movement from one increment to another? A positive response would be out of the question from the viewpoint of the Westerner's experience. Of course the arrow is not stationary, for it is in continuous motion! And from one temporal moment to another it would be preposterous to think that the arrow remained in one spot! However, the static arrow is perfectly natural within Zeno's framework. Commensurate with Zeno, for the Tlönian metaphysicists, intuition dictates that the coins cease to exist when they suffer the absence of their subject's gaze. In other words, the Tlönian's world is "a heterogeneous series of independent acts" (Borges, 1962, p.8), much like the series of synchronic states of Zeno's arrow, which is intuitively absurd as far as we are concerned.

We Westerners ordinarily senses that time is a flow, a "concourse of objects in space" (1962, p.8). Objects in the world, we would like to believe, are an ensemble enjoying continuous beingness and self-identity through time. And through time, we are able to connect a given fact with the temporal stream of previous facts. Such thinking is for the Tlönians unthinkable; linkage of one fact to another occurs in a later mental state "which cannot affect or illuminate the previous state. Every mental state is irreducible: the mere fact of naming it – i.e., of classifying it – implies a falsification" (Borges, 1962, p.10). That is, in a manner of speaking, to name a thing is to say that, in the now of the thing's naming, it is not what it was. Then to connect its nowness with its wasness, another temporal increment is required, and then another, to connect the previous three, and so on. Philosopher Francis Bradley makes his appearance here.

In Tlön, consequently, there are only particulars. In other words, the Tlönians at each and every moment abduct, like Peirce abducted his image of an azalea in the above quote. The problem is that they would create, abduct, the image of this azalea here, now, without there existing any continuity in the past of the same azalea, there, then, or in future expectation of the same azalea, somewhere, somewhen. In other words, the Tlönians are supreme abuctors. They abduct at each and every moment, as they bring the particulars of their world into existence. But they are incapable of induction, of bringing a collection of particulars together to form a general conception, though some very vague and elusive deductively engendered vision of their world manages somehow to hold them together in a loose community – apparently anarchy does not rule, nor are they all solipsists.

With this in mind, let's take a look at Borges's (1962) Funes the Memorious in his short story by the same name.

Funes, unlike the Tlönians, sees particulars "out there." However, he apparently can go no further than that. He can at a glance take in all the leaves, branches, contours on the trunk, a trail of ants up and down the left side of the trunk, a couple of birds furiously building a nest high to the right side, and so on, at a glance, and years later he can recall them to memory perfectly. The problem is that his memory is a garbage heap. It contains an indefinite number of individuals, but he is incapable of "ideas of a general, Platonic sort." It seems strange to him that a dog seen at 3:15 PM from the side is considered the same dog seen at 3:20 PM from the front. Conceiving numbers as an ordered series is for him impossible. He has simply memorized each number without establishing the necessary relations between them. In fact, he once developed his own alternative number system consisting of arbitrary names in place of every number, which for him was just as effective. Funes, in short, is unable to think, for to think "is to forget differences, generalize, make abstractions. In the teeming world of Funes, there were only details almost immediate in their presence" (Borges, 1962, 66).

In other words, Funes is a supreme nominalist, an ontological rather than a mental nominalist of the Tlönian sort. He does not abduct, like the Tlönians, with their remarkable powers of imagination. What he sees is what there is, here, now, and what there is in the next moment is something else altogether. That's all. Since whatever there is for him to perceive is perceived as a novelty at every moment, Funes is always primed for a surprise. In fact, everything is a surprise for him; it is new, fresh, unique. He is surprised, and hence the ideal candidate for an abductive act. But the act is never really forthcoming, for Funes is incapable of abduction, of genuine abduction, for his imaginary powers are next to nil. Everything is sees is in a sense abducted, but it is not genuinely abducted, for he passively takes everything in and contributes nothing. There is neither induction nor is there genuine abduction for Funes. And deduction is entirely out of the question. Poor Funes, so close to "reality" and so far from that which makes humans human. And yet,… and yet,… without Funes's ability to grasp particulars, coupled with the Tlönians imaginary prowess, I would suggest that we could hardly engage in worthwhile abduction ourselves. We need a little of the Tlönians and a little of Funes, with the proper balance, for when that balance gets out of kilter we risk becoming candidates for social exile or mental care. So, what about deduction?

There's another Borges short story, "Death and the Compass" (1962) that beautifully illustrates how deduction with symbols – in collusion with indices (of induction) and icons (of abduction) – can lead us astray. I[1]ll try my best to make a very detailed story short. Lönnrot, the detective, thinks he has outwitted Scharlach, the author of three

homicides. The first three murders were equidistant in time during November, December, and January. After the third crime Scharlach left a note proclaiming that this was his last violation. The wily Lönnrot knew better. Reality must follow symmetries, he reasoned, and since the number four is symmetrical, while the number three is merely bilaterally symmetrical – one half is a mirror-image of the other half – he inferred that there would be a fourth crime. It occurred to him to map the three events out on a map of the city. Much as he expected, they made up an equilateral triangle. It was simply a matter of using a compass to plot the site of the expected crime, computing the number of days equal to the days between the first three crimes, and Lönnrot had the time and place where he would finally catch his criminal counterpart.

At what he thinks is the proper time, he proceeds to that point. But to his surprise he is quickly apprehended by Scharlach's henchmen. Then he is told that he had miscalculated his time, for he should have followed the Jewish calendar – there are allusions to Judaism through the narrative. Scharlach, a step ahead of Lönnrot, knew he would follow reason rather than intuition and appear on this day, revealed to the detective that he, Lönnrot, was to be the victim of the fourth crime. Then he drew his piston and aimed.

Lönnrot used his symbols of time and Euclidean geometric space along conventional pathways. That was his undoing. He failed to heed the Judaic symbols within the context of each murder and followed his Gregorian-Christian calendar. He plotted the crimes on a flat sheet, in good Cartesian fashion, as if the labyrinth he were weaving for Scharlach was of two-dimensional making. When he confidently entered the mansion at Triste-le-Roi where he assumed the fourth crime was to occur, he found himself in a three-dimensional labyrinth of spiral staircases, mirrors that reflected themselves to create artificial three-dimensional depth, stained glass windows that created a three-dimensional prismatic illusion, and rooms that whose doors led to other rooms whose doors doubled back through other rooms in bewildering fashion. He, having dwelled in his two-dimensional Cartesian plane, now found himself trapped in a three-dimensional tangle, that, given his one-dimensional trajectory from the beginning of the tale, produced a four-dimensional spacetime construct. It was as if Scharlach, with a God's-eye view from his higher spatial vantage point, knew exactly what Lönnrot was going to do and when he would do it.

All this is to say that Scharlach used icons (geometrical figures, maps, images), indices (equidistant times and places as putative indication of crimes), and symbols (geometry, arithmetic, calendar, words) to make a (deductive) prediction. But everything backfired,

for Scharlach's semiotics was played out within a distinct, even incommensurable, world. Scharlach could translate Lönnrot's symbols into signs of Lönnrot's world but Lönnrot could not do the same with Scharlach's signs. Lönnrot found himself imprisoned within the (deductive) signs of his own making. This is because he had taken his signs and symbols primarily as indicators (indices), signs of Secondness whose cause and effect nature were invariant and predetermined. He had not reckoned that there might be an entirely different world, that of Scharlach's signs and symbols, whose icons and indices were equally distinct. In other words, Lönnrot assumed the conventionality of his signs and symbols was sufficient, without entertaining the idea that there might be other (abducted) possibilities of sign use regarding which he had hitherto been unaware.

The moral to the story? Don't put all your deductive signs and symbols in one basket, and always be on guard for new (abductive) possibilities and (inductive) signs of the unexpected: surprise, deceit, subterfuge, domination and control, that can land you in deep problems. It would seem, then, that to erect fixed lines of demarcation between abduction, induction, and deduction, or to subdivide any of these processes, would be artificially to halt the processes. Process is process, and it must be allowed maximum free rein.

## Continuity and Discontinuity: the Topological View

The Tlönians couldn't induct nor could they properly deduct, and their abduction was limited to mental worlds. Induction and deduction were also out of the question for Funes, though his perpetual state of surprise left him susceptible to abduction, were his imaginary powers up to the task, but they were not. The Tlönians possessed imaginary powers, to be sure, but they remained out of touch with anything remotely comparable to what we take as our brute physical world. Lönnrot could deduct with the best of them, but he could neither admit to any genuine surprises nor could he properly induct in good Sherlock Holmes fashion. A pretty sorry lot all three of these characters? In a way of looking at their plight, yes. Yet, put the three of them together and they would make a genius of the sort the world has rarely seen. Balance, to reiterate, is the keyword, a happy balance.

With this in mind, I take a tangential leap into space in an effort to account for the continuity of abduction-induction-deduction, that can create the balance we might be looking for. In the spirit of Pape's "topological" view of abduction – suggestions of which are found above on Peirce and continuity – first there is what Peirce called "nothing," an

n-dimensional continuum of possibilities. Then comes a lonely line, a unidimensional quality or continuum. This like is no mere line, however. It is the line of Firstness, the unidimensional quality sporting myriad possibilities for future actualization of Seconds. Then there is a cut in the line – the Dedekind cut – separating something from something else. This is the act of Secondness, a bare mark of distinction without there yet existing anything, any-thing, distinguished from any-thing else. Finally, interrelations arise through interaction between quality and the particularities of Secondness by way of mediation: Thirdness. But this is no developed, robust, well-fed Thirdness, pregnant with meaning. It is no more than the emergence, the raw suggestion of mediary Thirdness, promising many things to come, if the conditions are right that is. In Pape's words:

> "Qualities in Peirce's evolutionary cosmology and in his theory of abduction are given the form of unidimensional continua because a sequence of such a form connects qualities and their representations. The form of the unidimensional continuity results from the logical requirement that there has to be an [sic] direct connection between (i) qualitative content and (ii) the inductive distribution of possible determinations of qualitative contents … Peirce's insistence that forms are captured adequately only in iconic or diagrammatic format, that all logical and argumentative sequences structure a realm of possible quality, is at the heart of his philosophy of mathematics and its epistemological and especially abductive dynamics in its theoretical development." (Pape, 1999, p.267-68)

Indeed, mathematics is a matter of hypothetical images and their consequences. As purely hypothetical images, they are of the nature of dreams, nothing more, nothing less. This is a most important point, for if abduction is of the nature of dream, of fiction, of vague, overdetermined possibilities, then the consequences of dream, generalities, of underdetermined alternatives, will forever remain with the door open, and life will hold its interest rather than impose limitations.

Balance. Once again if I may: that's the watchword. If we have it, we abduct, and the world welcomes us with open arms; if we don't have it, we've got too much of either the Tlönian, Funes, or Lönnrot in us. In large part, the choice – abducted to be sure – is ours.

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