AN ONTOLOGY OF CLIMATE CHANGE
Integral Pluralism and the Enactment of Multiple Objects

Sean Esbjörn-Hargens

ABSTRACT Climate change is a complex phenomenon that is enacted by multiple methodologies from various disciplines. No single method by itself can "see" or reveal climate change in its entirety. This raises the issue of the ontological status of climate change and to what degree are the data from these methodological traditions pointing to a singular or multiple object. This article explores the ontology of climate change. First, the notion of ontological pluralism is introduced and linked to climate change. Next, the role of enactment and performativity is explored in the context of climate change. As a result of this analysis, climate change is presented as a multiple object with overlapping and divergent dimensions. Issues of hybridity and multiplicity are linked to climate change action. Lastly, a framework of Integral Pluralism is presented that addresses the relationship between epistemological distance (the Who), methodological variety (the How), and ontological complexity (the What). In conclusion, this article presents five reasons why it is advantageous—philosophically and pragmatically—to relate to climate change as an ontological plurality.

KEY WORDS: enactment; Integral Theory; methodology; multiple objects; ontological pluralism

> [I]f ontology is multiple, then it is also political. Ecological debates are becoming both more complex and epistemologically distant. The days of environmental crises that can be easily seen and quickly contained are rapidly becoming distant memory. The global environmental problems of the twenty-first century are thus likely to become increasingly multiple as they move further and further beyond our epistemological reach. What, then, are we to do? With people ultimately talking about different objects, how can we ever hope for consensus and cooperation?....there is still hope. Remember, multiplicity does not necessarily mean fragmentation. All that is solid does not melt into thin air.
>
> *– Michael Carolan*[1]

So what is the ontological status of climate change (CC)? Is it real or not? Is it happening at an alarming apocalyptic rate or is it environmental hype driven by special eco-interests? Or is it somewhere in-between or some mix thereof? Or might it be something altogether different than what this common binary framing can allow? What if it was *very* real but not real in the way that we typically think (or feel) about "things out there" in the external world?

This article is about ontology and CC.[2] It presents what I feel is a unique view on the topic—at least unique in the context of CC discourse. Although many have presented the many-sidedness of CC—Mike Hulme's

Correspondence: Sean Esbjörn-Hargens, John F. Kennedy University, 100 Ellinwood Way, Pleasant Hill, CA 94523-4817. *E-mail*: shargens@integralinstitute.org.

(2009) wonderful *Why We Disagree About Climate Change* comes to mind—the ontological aspects of complex global phenomena have often gone under-discussed in the literature.[3] In short, I am presenting CC as real and multiple opposed to real and singular. As integral activist Jan Inglis (2008) notes:

> Rather than being "one thing," climate change is a complex of complex issues made up of many interconnected sub-issues at many scales worldwide from lawn maintenance and building codes to population growth, subsistence practices of clearing old-growth forests, and gas flaring practices in oil processing, to terrorist acts and countless others—all reflecting many different values, needs, and resulting behaviors. Responses to each such cause require different types of focused attention— impossible when we keep referring to this generalized topic. (p. 498)

In other words, it is not the assumed single reality that most everyone presumes when they discuss CC. Rather, it is a *multiple object*.[4] So while it may be *multiple* (which makes it hard to pin down or easily contain in any one methodological context or epistemological framework), it is an *object* nonetheless. That is, it is *real*! It is indeed and unequivocally a third-person (inter)objective phenomenon. In fact, as we will see, it is also a hybrid object—a combination of scientific third-person observations and cultural second-person meanings. Technically, CC is an *integral object*: an ontologically distinct phenomenon that is a combination of first-, second-, and third-person dimensions.

At first glance, the notion that CC is a multiple object might seem like a contradiction.[5] Many would claim that an object can only be singular (not multiple). Thus, they take the concept of ontological multiplicity as a sign that whatever phenomenon it purports to label or describe is not or cannot be real. In this context many find political value—not to mention psychological value—in reducing a complex phenomenon like CC to a simplified singular object; as something that everyone can rally behind and ostensibly point to. But as we have seen, most recently at the Copenhagen climate conference in December 2009, it is not enough to have people and nations agree to the reality of the phenomenon. One of the reasons I feel the representatives at the conference were not successful in agreeing on how to respond to the accepted reality of CC is in part because they were dealing with a multiple object but were treating it as a single object. Wider recognition of CC's multiplicity would encourage a diverse set of responses being endorsed over any "magic bullet" or "one size fits all" approach.

Furthermore, conceiving of CC as a multiple object makes it *more real*. More real because more of its third-person dimensionality is acknowledged. In other words, the complexity of the phenomenon is not reduced to a single object. Recognizing CC as such might actually help climate leadership facilitate the kind of mobilization needed to respond to such a multilayered, borderless issue. As I will argue, we do not have a simple case of many perspectives looking differently at a single object (e.g., a circle of people looking at a red ball in the middle) but rather have multiple perspectives using a variety of techniques, practices, and injunctions to enact multiple objects that overlap with and diverge from each other in numerous ways to generate an object that goes under the signifier of CC.[6]

So, let me back up and begin to unpack my position and provide some anchoring in the kind of thought that has led me to view CC in this fashion. Understanding a complex phenomenon such as CC presupposes

the need to weave together epistemological, methodological, and ontological perspectives. My aim here is simply to provide a primer of sorts on the value and validity of viewing CC through a lens of ontological pluralism.[7] This article is aimed at advanced scholar-practitioners of Integral Theory, and as such it assumes a familiarity with its post-metaphysical commitments such as Integral Methodological Pluralism. This article is also aimed at environmental philosophers and activists who feel current framings of CC are too simplistic and are interested in a sophisticated framework of pluralism and enactment that can help identify key sites of action. While this article is predominately philosophical in its presentation, there are some important pragmatic reasons discussed in the conclusion as to why CC leaders should embrace a multiple object ontology.

I also want to introduce to the integral community some useful discourses, such as Roy Bhaskar's (1978, 2002a, 2002b) critical realism and meta-Reality, Bruno Latour's (2005) actor-network theory (ANT), science and technology studies (STS), and John Law (2002) and Annemarie Mol's (2002) explorations of multiplicity.[8] These discourses are valuable for developing Integral Theory's post-metaphysical approach to enactment and how this approach pertains to ontology.[9] This approach to enactment has much in common with Francisco Varela's *enactive paradigm* as presented in *The Embodied Mind* (1991) and Evan Thompson's *Mind in Life* (2007). However, there are some important differences, as we will see.[10] In this article, I want to shine the light on an important and little understood aspect of Integral Theory—enactment.[11] I also want to model a form of enactive writing, wherein I as an author am reflective of how I am enacting this article (e.g., through the use of injunctive opposed to ontic language).[12] I feel integral theorists need to explore more fully the implications philosophically, (post)metaphysically, and pragmatically of enactment and how this stance differs from mere postmodern constructivism or relativism. Let us start with the notion of ontological pluralism.

Before we examine the ontological status of CC, let me give a brief illustrative example of ontological pluralism with a less complex object: an empty soda bottle.[13] Such a bottle can be used for a number of things (e.g., as a simple musical instrument, as a vase for a flower, or as an opportunity for a deposit refund). In each case the ontological status of the bottle is enacted in part by the method of interacting with it. Taking the lead from Mol (2002), on the one hand there is *more than one* bottle possible, but there is something constant—intrinsic features—that runs through the various bottles (i.e., there are *less than many*). The reality of the bottle as instrument, vase, or cash refund is not dependent on your viewpoint but rather on the social practice of interacting with the bottle. Hence each use of the bottle carries with it a distinct ontological enactment.[14] In other words, the ontological status of an object is not entirely independent of the actor or action involved. And when there are multiple ways to interact with an object this contributes to the generation of ontological pluralism. In fact, as we will see, ontological pluralism is enacted through an increase along three axes: *epistemological distance*, *methodological variety*, and *ontological complexity*. Now let us take a look at CC in this context.

Ontological Pluralism and Climate Change

Scholar-practitioners associated with Integral Theory are already quite familiar with methodological pluralism. In fact, one of the key frameworks of the Integral approach is Integral Methodological Pluralism and its associated eight zones of methodological families (see Wilber, 2006). Similarly, they are familiar with the notion of epistemological pluralism through the emphasis Integral Theory places on developmental worldviews and multiple perspectives being "true but partial." However, the notion of epistemological pluralism has remained implicit in Integral Theory. Furthermore, Integral Theory is clear that where there is episte-

mology and methodology, there is also ontology. But curiously there is no mention of ontological pluralism within Integral Theory. Its absence is all the more striking given Integral Theory's post-metaphysical stance on enactment, which highlights that specific methodological practices bring phenomena into being.[15] So, on the one hand the notion of ontological pluralism is implied in Integral Theory and on the other hand it is even less developed than the implicit notion of epistemological pluralism. So there are three pluralisms that should be explicit within Integral Theory: epistemological, methodological, and ontological. These three aspects are essential to the notion of Kosmic address, which highlights that an observer uses a method of observation to observe something.

In *Integral Ecology* (2009), Michael Zimmerman and I develop this triadic structure of enacted realities into a framework: The Who x the How x the What. This formula is based on the simple inquiries of who is looking, how are they looking, and what are they looking at (or, in a post-metaphysical context, who is enacting, how are they enacting, and what are they enacting). The emphasis here is that epistemology is connected to ontology via methodologies. So, if we are going to have epistemological pluralism (the Who) and methodological pluralism (the How), then we ought logically (or integrally) to have ontological pluralism (the What). I call this triadic combination *Integral Pluralism*. Integral Pluralism specifically includes: *Integral Epistemological Pluralism* (IEP), *Integral Methodological Pluralism* (IMP), and *Integral Ontological Pluralism* (IOP).[16] Integral Pluralism forms the basis of what I am calling *Integral Enactment Theory* (IET).[17] In what follows, I introduce the concept of ontological pluralism in particular and the Integral Pluralism framework of Integral Enactment Theory in general. By developing the notion of enactment within Integral Theory through this pluralistic approach, I feel integral scholar-practitioners can more effectively address a complex global phenomenon like CC.

In order to begin to grasp the inevitability of ontological pluralism, let us consider the different methods that are often used to "see" (i.e., enact) CC. Table 1 lists 18 generic professions (the Who), a representative methodology associated with each discipline (the How), and a resulting view of CC (the What). Within each column, I have used parentheses to provide a likely Kosmic address. In the Who column are some representative altitudes associated with each profession: amber (A), orange (O), and green (G). Each of these professions have individuals within them at each major altitude (red through turquoise altitude). So here I am just picking a likely altitude for illustrative purposes. In the How column I have used parentheses to indicate the primary zone that is being indicated in this context: zone 1 (Z1), zone 2 (Z2), and so on.[18] Many of the methods listed could be associated with a different zone, and many of the examples below might even have an equal emphasis on two or more zones. The point here is to provide an example of what is involved with enacting CC. Hence, I have indicated only one zone per method to keep things relatively simple. In the What column I have used parentheses to point out what aspect of reality is being focused on in terms of the likely "view" of CC that emerges from the method used by the subject. Again, as with the other two columns we could have a variety of combinations of quadrants indicated. I have chosen to list one and in some cases two quadrants. Many details are left out, but I believe the important point is clear: namely, that individuals associated with each of these professions are using various methods to enact different—sometimes overlapping, sometimes divergent—views of CC.

Of the professions outlined in Table 1, some are associated with the Lower-Right (LR) quadrant or Terrain of Systems (e.g., climatologist, political analyst, population ecologist); the Upper-Right (UR) quadrant or Terrain of Behaviors (e.g., political activist, cognitive scientist, behavioral economist); the Upper-Left

The Who A Generic Profession	The How A Representative Method	The What A View of Climate Change
Climatologist (O)	Comparing tree rings (Z6)	There have been cycles of drought over 500 years (LR)
Meteorologist (O)	Examining records of rainfall (Z6)	Rainfall is increasing in some regions (LR)
Human geographer (G)	Survey of Peru farmers (Z4)	Long-term community memory on CC is lacking (LL)
Oceanographer (O)	Correlating algae blooms with water temperature (Z6)	Ocean currents are warming in the Gulf Stream (LR)
Ethnographer (G)	Collecting local stories about climate change (Z3)	There is no unified view of what is or isn't happening (LL/LR)
Phenomenologist (G)	In-depth interviews with liberal college students (Z1)	CC is the most important issue facing humanity (LL)
Discourse analyst (O)	Comparing rhetorical motifs in media stories (Z4)	The truth of CC depends on the framing (LL)
Psychoanalyst (G)	Individual sessions with small town clients (Z1)	Eco-anxiety about CC is impacting individual lives (UL)
Cognitive scientist (O)	Examining the cognitive biases in risk perception (Z5)	CC is too distant to activate behaviors (UL)
Behavioral economist (O)	Study of using smart meters to change energy use (Z8)	Investing in smart meters can make a big difference (LR)
Political analyst (O)	Calculating policy impacts on carbon emissions (Z8)	Our current policies are not tough enough (LR)
Environmental philosopher (G)	Facilitating a symposium on climate justice (Z3)	CC is fraught with moral dilemmas (LL)
High school teacher (A)	Showing their class a PowerPoint with charts (Z6)	Students were emotionally impacted by CC (UL)
Computer modeler (O)	Developing a new software program (Z8)	We are going to see at least a 4 degree rise in temperature (LR)
Kenyan farmer (A)	Weighing per-acre crop yield (Z6)	This has been a difficult year for my family (LL/LR)
Population ecologist (O)	Measuring infertility rates in Arctic caribou (Z6)	Species are being threatened by CC (LR)
Political activist (A)	Counting how many arrests were made at the protest (Z6)	Not enough people care about CC (UL)
Arctic researcher (O)	Tracking permafrost thawing (Z8)	We are getting close to a "tipping point" (LR)

Table 1. Enactments of climate change.

(UL) quadrant or Terrain of Experience (e.g., psychoanalyst, phenomenologist, high school teacher); and the Lower-Left (LL) quadrant or Terrain of Culture (e.g., human geographer, discourse analyst, ethnographer).[19] This table raises some interesting issues. All too often we assume that when individuals from each of these professions are talking about CC they are all talking about the same *thing*, which is typically characterized as including heating of the planet, melting, polar ice caps , rising sea levels , disrupted weather patterns (e.g., damaging rains, devastating droughts), and negative consequences for humans and other organisms. We often assume that each profession sees the same global phenomenon or at least some important piece of the climate puzzle, which when placed together gives us a complete picture of something called CC.

But is it that simple? Is the phenomenologist seeing the same CC as the meteorologist? Is the political analyst talking about the same CC as the Kenyan farmer? Is the oceanographer mapping the same CC as the computer modeler? In some sense yes, but in other ways they are not. We often assume that CC is an independently existing, objective, third-person reality that exists "out there," and that our many techniques and methods can be coordinated so as to provide the most accurate possible representation of the phenomenon.[20] I am not disputing that all the professions outlined in Table 1 are talking more or less about the same thing. But that is the point—*more or les*s. In other words, there are intrinsic features of CC that cut across the various enactments of it, but how it "ex-ists" varies depending on the Who–How–What.[21] In fact, there is not a clear, single, independently existing object, nor are there multiple different objects. There is something in-between: a multiple object, with intrinsic features that are enacted from various individuals with their own Kosmic address using various methods to examine overlapping, but in many cases distinct, territories of climate. This multiple object is actually a complex set of phenomena that cannot easily be reduced to a single independent object.

Annemarie Mol's (2002) illustrative work in the context of the medical profession is instructive here. In studying the disease atherosclerosis in a European hospital, "she shows that different practices tend to produce not only different *perspectives*, but also different *realities*…" (Law, 2004, p. 13). Or as Clay Spinuzzi (2003) puts it: "Mol persuasively argues that the things we take as settled, scientifically quantifiable and observable phenomena are not really just objects-in-the-world; rather, they are always multiple. Reality itself, she says, "multiplies when we focus on artifacts or practices." Thus, practices or methods used to understand CC do not just describe it; instead, they actually help produce or enact it. In other words, they produce the signified, not just the signifer. As John Law (2004) eloquently states, "The argument is no longer that methods discover and depict realities. Instead, it is that they participate in the enactment of those realities" (p. 46). When we allow for the enactive or performative nature of methods, we begin to understand how the use of multiple methods to understand an alleged single phenenomon like CC results in multiple—but networked—objects. In fact, as implied earlier, Mol (2002) has a powerful adage that captures this ontological status: "more than one—but less than many" (p. 55). Law (2004) points out that such multiplicity does not suggest that we live in a relativistic world. "It does not imply that reality is fragmented. Instead it implies something much more complex. It implies that the different realities *overlap and interfere with one another*. Their relations, partially coordinated, are complex and messy" (p. 61). These different realities are enacted by different methodologies and can be networked into various examples of a multiple object. This is very true for CC. One reason it is so complex is that no single method can enact it in its entirety.[22] Moreover, as we will explore below, another compounding problem is that a high level of vision-logic is needed to enact CC fully because of its abstract nature, because of the space-time scales involved, and because of the need to coordinate competing and complementary epistemological, methodological, and ontological insights.

Whereas moderns often posit a reliable objective, independent status to so-called reality, and whereas post-modernists tend to emphasize the constructed character of reality, Integral Theory takes the middle path by positing that reality is generally a hybrid, wherein phenomena are enacted or constituted from out of a dance between the extra-human and the human, between what is in some sense given and how that given is always already taken up in an act of interpretation, between ontological and epistemological/interpretative factors. While modernity emphasizes ontology (the What) and postmodernity often emphasizes epistemology and interpretation (the Who), Integral Theory emphasizes the role played by methodology (the How) in linking and integrating ontology and epistemology through the enactment, constitution, or performance of the phenomenon being investigated. Integral Theory uses the formula the Who x the How x the What as one way to integrate these three crucial factors.[23] One of the results of this integration is what I call *ontological pluralism*.

Although modernism, postmodernism, and integralism all tend to emphasize different aspects of the enactment process, they all have a characteristic view of ontology. So even though postmodernism often emphasizes epistemology, it still has an approach to ontology. In each case, the ontology associated with each worldview is the result of where it places its focus. For example, modernism's emphasis on ontology lends itself to a positivist view that emphasizes the singularity of objects (i.e., there is one independent pre-given object that we strive to represent accurately through forms of mapping). In contract, postmodernism's emphasis on epistemology lends itself to a relativist view that emphasizes the discontinuity of objects (i.e., there are as many objects as there are viewers). Integralism's emphasis on methodology lends itself to a pluralistic view that emphasizes the multiplicity of objects (i.e., many objects are neither simply a positivist one or a relativistic many, but a hybrid of both) (Fig. 1).
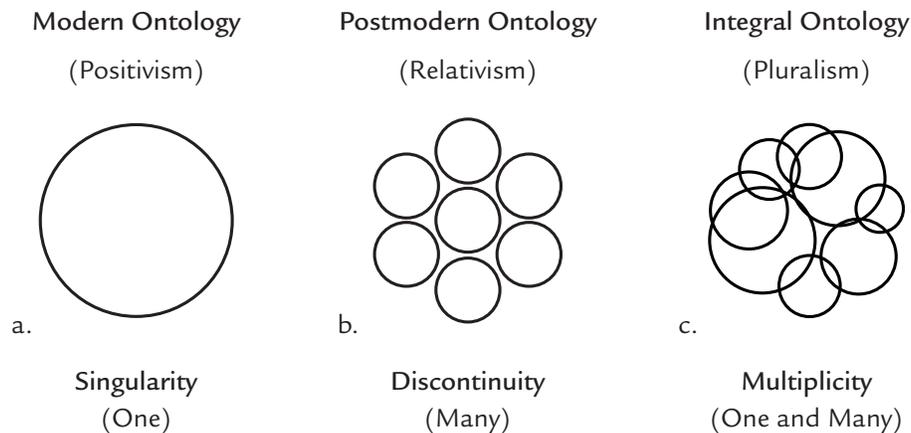

Modern Ontology (Positivism)	Postmodern Ontology (Relativism)	Integral Ontology (Pluralism)
a.	b.	c.
Singularity (One)	Discontinuity (Many)	Multiplicity (One and Many)

Figure 1. Various ontological positions.

What makes Integral Pluralism unique is that it can account for and make room for all three ontological positions as a result of its embrace of enactment. So not only can it account for its own view of ontology (i.e., multiplicity), but it can account for and honors and acknowledges the value of the other views of ontology (i.e., singularity and discontinuity). Each form of ontology is the natural result of enactment: the worldviews, their preferred methods of inquiry, and the focus of scientific investigation. As a result, Integral Pluralism recognizes that these three representative approaches to ontology are another example of ontological pluralism in that each of them enacts their view of ontology via the specific injunctions associated with the social practices

acceptable within their worldspace. So, ontological pluralism is not just multiplicity—it is the recognition that all ontologies are enacted, be they singular, relativistic, or multiple. Each is appropriate within certain contexts with advantages and disadvantages. Thus, the integral advantage here is not just that an integral view offers a new complex view of ontology but that I can also explain the other views of ontology in a way that is consistent with its explanation of its own ontology. This is "transcend and include" at its best. In this article, I will be focusing on the advantages of ontological pluralism, particularly in the context of enacting CC.

The Enactment of Climate Change

Having introduced ontological pluralism, I want to describe in more detail what I have in mind by *enactment*. Law (2004) defines enactment in the following way:

> The claim [is] that relations, and so realities and representations of realities…are being endlessly or chronically brought into being in a continuing process of production and reproduction, and have no status, standing, or reality outside those processes. (p. 158).

Mol (2002) devises the term "praxiographic inquiry" to refer to a) the study of how objects are produced by practices or injunctions and b) the complex relationships between multiple objects.

> So, I need a word that doesn't suggest too much. A word with not too much of an academic history. The English language has a nice one in store: *enact*. It is possible to say that in practices objects are *enacted*. This suggests that activities take place— but leaves the actors vague. It also suggests that in the act, and only then and there, something *is*—being enacted. (pp. 32-33)

Now both the foregoing uses of enact are consistent with Ken Wilber's usage in his post-metaphysical writings. For example, in the context of introducing IMP, he states, "Each view or perspective, with its actions and injunctions, brings forth [i.e., enacts] a world of phenomena; a worldspace that (tetra-)arises as a result; a worldspace with a horizon. The sum total of all of that we simply call a **hori-zone**, or **zone** for short" (Wilber, 2006, p. 38). Wilber (2006) is well-known for cautioning against the *myth of the given* where:

> …there is no given world, *not only* because intersubjectivity is a constitutive part of objective and subjective realities, *but also* because even specifying intersubjectivity is not nearly enough to get over that myth in all its dimensions: you need to specify the Kosmic locations of both the perceiver and the perceived in order to be engaged in anything except metaphysics. (p. 257)

Recall that Table 1 uses different Kosmic addresses to designate various enacted realities that all fly under the banner of CC.[24] Thus, there is not a single Kosmic address for CC.[25] If there were, we would be more justified in claiming it is a single object. But there are dozens, if not hundreds, of relevant Kosmic addresses that comprise what is signified when CC is discussed. Wilber (2006) often emphasizes the importance of injunctions (i.e., social practices that enact phenomena) in locating a Kosmic address:

> If you want to make a positive assertion about an entity, particularly if that assertion claims or implies it existence, you must be able to specify the Kosmic address of the entity (i.e., the Kosmic address of the referent of the signifier)—which refers to the Kosmic address of the perceived—and you must also be able to specify the Kosmic address of the perceiver, and that implies being able to specify what **injunctions** (paradigms, exemplars, enactions) **a perceiving subject must perform** in order to be at a Kosmic address that CAN perceive the object.

> Thus, we cannot make any ontic or assertive statement—whether scientific, spiritual, ecological, medical, etc.—without being able to specify the Kosmic address of the object and the Kosmic address of the subject, which also means, the **injunctions** that the subject must perform in order to enact and access the worldspace of the object. (p. 267)

A bit later on, Wilber (2006) summarizes:

> We saw that if we cannot specify the Kosmic address of the perceiver and perceived, we have assertions without evidence, or metaphysics. And we can now see that this also means that *we must be able to specify the injunctions necessary for the subject to be able to enact the Kosmic address of the object*. The meaning of any assertion is therefore, among other things, the injunctions or means or exemplars for enacting the worldspace in which the referent exists or is said to exist (and where its existence can, in fact, be confirmed or refuted by a community of the adequate). Hence, in shorthand, *the meaning of a statement is the injunction of its enactment*. No injunction, no enactment, no meaning. (p. 268)

Implicit in Wilber's revolutionary, post-metaphysical commitment to "injunctive language" and the performativity of methods is that enactment entails ontological pluralism. While he himself has not talked explicitly about ontological pluralism, his integral position can clearly support such a post-metaphysical stance.

Let us now turn to John Law and John Urry's essay "Enacting the Social" (2003), which provides a nice bridge from Wilber's view of enactment to the application of this notion to a major global issue like CC. Early in the article they state, "So what of research methods? Our argument is that these are <u>performative</u>. By this we mean that: they have effects; they make differences; they enacts realities; and they can help to bring into being what they also discover" (Law & Urry, 2003, p. 3). Then, quoting the German theoretical physicist Werner Heisenberg, they write: "What we observe is not nature itself, but nature exposed to our method of questioning" (as quoted in Capra, 1996, p. 40). They go on to explain:

> There is little difference between physics and social science here: theories and methods are protocols for modes of questioning or interacting, which also produce realities as they interact with other kinds of interactions. This means that we are not saying that reality is arbitrary. The argument is neither relativist nor realist. Instead it is that the real is produced in thoroughly non-arbitrary ways, in dense and extended

sets of relations. It is produced with considerable effort, and it is much easier to produce some realities than others. In sum, we're saying that the world we know in social science is both real and it is produced. (Law & Urry, 2003, p. 5)

There are a number of interesting things to highlight in the preceding paragraph. First, what it says applies equally to the natural sciences as it does to the social sciences. This is important because while CC is often associated with enactments from the natural sciences, an integral view of CC has to include and coordinate enactments from the social sciences as well. This is part of what makes CC such a fascinating, elusive, and complex set of phenomena—it is not merely a third-person enactment or even a plurality of third-person enactments. Second, Law and Urry are clear that they are going between the horns of the modern realist and postmodern relativist dilemma. In fact, in an endnote they state: "The argument we are making is about method-making-knowledge-and-realities; it is both epistemological <u>and</u> ontological" (Law & Urry, 2003, p. 12). This is a post-metaphysical stance in that they are not denying the third-person "factual" or "real" nature of a complex phenomenon such as CC. But they are pointing out that such apparent external phenomena are produced by not only third-person methods but also first- and second-person methods. Third, inherent in this position is ontological pluralism, as we learn later on:

> However, if method is interactively performative, and helps to make realities, then the differences between research findings produced by different methods or in different research traditions have an alternative significance. No longer different <u>perspectives</u> on a single reality, they become instead the enactment of different <u>realities</u>.… [This] is a shift that moves us from a single world to the idea that the world is multiply produced in diverse and contested social and material relations. The implication is that there is no single 'world'.

> Our suggestion, then, is if methods and practices are performative then worlds become multiple—though not necessarily entirely disconnected. This is because the extent to which they and the various methods, which helped to produce them, differ from one another is an empirical matter. In practice, no doubt methods and the practices in which they are carried overlap. This means that the realities that they produce also overlap and interact with one another. (Law & Urry, 2003 p. 6)

Thus different disciplines and fields of research literally occupy different worlds through the set of methods practitioners use to enact a shared reality. Putting this insight to our own use, we can say that while CC is a multiple object, it does not imply that reality is fragmented or that the integral inquiry is undertaken from a relativistic stance. Rather by recognizing the multiple object nature of a complex environmental phenomenon such as CC, we can begin to tend to the *in-betweeness* of its multiplicity. By treating CC as single object "out there," we blind ourselves to the many strategic leverage points that become more obvious and accessible when its multiplicity is recognized.

An important issue that emerges once we acknowledge ontological pluralism is this: Given we can enact different realities, which ones do we want to either "enact or erode?" Mol (2002) refers to this situation as *ontological politics*.[26] In the context of CC, which enactments do we want to be more

or less real: apocalyptic collapse, technological utopia, a 4-degree temperature rise over the next 10 years, 350 ppm, globalization, world governance, climate refugees, longer growing seasons in Northern regions, etc. As you can imagine, there is much political warfare around how these and other realities connected to CC are enacted and eroded. Thus, ontological politics quickly becomes *ontological ethics* as we decide individually or socially what to enact and when one enactment is more appropriate or valuable than another one.

Another important point is that CC is a new object for research—only about 30 years old.[27] Obviously there has been third-person global CC for millennia, but the point is that it is only in the past few decades that CC as we (mis)understand it has been enacted. Law and Urry (2003) discuss how the reality of "the global" has emerged in recent years:

> [The global] is enacted, as aspiration rather than achievement, as effect rather than as condition, and as a project to be achieved rather than something that is pre-given. The global comes to constitute its own domains; it is continuously reconstituted through material-semiotic processes. And to enact the global means that many individuals and organisations come together to mobilise around phenomena that appear to possess and demonstrate a global character. This is what has happened, for instance, for a 'global nature'. Its emergence has resulted from various social practices, including the social sciences of globalisation, images of the earth from space, transport policies, deforestation, energy use, media images of iconic environments, dramatic environmental protests, scientific papers on climate change, the ending of the Cold War, NGO campaigns, records of extreme weather events, pronouncements by global public figures, and global conferences such as Rio and Kyoto. Together these perform a 'global nature' that appears to be undergoing irreversible change. A new object ('global society') is thus being brought into being, an entity fit for analysis and understanding, an entity that did not exist until it was relationally constituted and performed. (p. 7)

In a similar way, CC has been enacted through a variety of social practices and injunctions associated with the disciplines in the natural sciences and social sciences, as well as the humanities and the arts. Now that I have unpacked the notion of enactment in the context of CC, I want to direct our attention to CC as a multiple object. Just as we have benefited from taking a closer look at the notion of enactment, I believe we will benefit from focusing on multiplicity.

Climate Change as a Multiple Object

In his provocative book *After Method*, Law (2004) addresses why it is that the Euro-American experience of the lifeworld lends itself to a strong conviction of *primitive out-thereness*, such that "…there is, indeed, a *reality that is out there* beyond ourselves" (p. 24). He presents some additional criteria for the sense of "out-thereness" to which we adhere. In particular, he names *independence* (i.e., reality is independent of our actions and perceptions), *anteriority* (i.e., reality comes before we do it precedes us), *definiteness* (i.e., reality is ordered and definable), and *singularity* (i.e., reality is shared by everyone everywhere).[28] Commenting on

the findings of Latour and Woolgar's groundbreaking ethnography of science *Laboratory Life* (1979), Law states:

> Contrary to Euro-American common sense, they are telling us that it is not possible to separate out (a) the making of particular *realities*, (b) the making of particular *statements* about those realities, and (c) the creation of *instrumental, technical and human configurations and practices*, the inscription devices that produce these realities and statements. Instead, *all are produced together*. (Law, 2004, p. 31)

One thing that strikes me about his quote is that his (a), (b), and (c) can be lined up with my formula for Kosmic address (the Who x the How x the What), where (a) is the What, (b) is the Who, and (c) is the How.[29] Here is yet another example of Law's post-metaphysical leanings. In light of this triadic structure of enactment, Law points out that "out-thereness" is eroded away. If we return to the criteria listed above we see that: *independence* is undermined in that reality is enacted (in some respects produced) by specific methods, not merely described by them; *anteriority* is undermined in that reality and the claims/data about that reality are produced together; *definiteness* is undermined in that forms and relations can be definite or fuzzy depending on the methods employed; and *singularity* (i.e., a single pre-given, independent, third-person reality) is undermined in that it occurs as a result of dissolving or ignoring controversies and anomalies, so while it might emerge, it is always tenuous and contextual. As these criteria for a singular pre-given world are undermined, they give way to a world of multiplicity that is enacted. Furthermore, Law (2004) points out, following Latour and Woolgar's conclusion, that a sense of out-thereness is actually "an accomplishment rather than something that defines and sets limits to the ways in which we can properly know the world" (p. 37). Thus, it is the combination of (a), (b), and (c) that "work to *produce* a reality that is independent, anterior, definite and singular" (p. 37). In this sense, a pre-given world is enacted and not laying around waiting for someone to come along with the right set of injunctions and discover it. "For, alongside the practices of multiplicity, there are endless practices for insisting on, presupposing, and producing singularity" (Law, 2004, p. 65). So it is not that multiplicity is inherently better than singularity, but they are both produced or enacted. What is problematic is when commitments to singularity ignore their enacted nature and deny the possibility of non-singular enactments. Law (2004) defines multiplicity in the following way:

> ...[T]he simultaneous enactment of objects in different practices, when those objects that are said to be the same. Hence the claim that there are many realities rather than one. This arises because practices are endlessly variable and differ from one another. The additional claim that practices overlap and in many and unpredictable ways, so there are always interferences between different realities. (p. 162)

Given the nature of CC, it is quite useful to recognize it as a multiple object. We only have to recall the small sampling of enactments captured in Table 1 to realize how many scales, timeframes, disciplines, worldviews, data sets, methods, and the like are involved with producing CC. It is easy to see how simply focusing on the What lends itself to a view of singularity.[30] When we include the Who and the How, however, it is increasingly hard to avoid the recognition that there are in fact multiple enacted objects that hang together in overlapping and discontinuous relationships to produce a complex object—in this case CC—that is "more than one, but less than many."
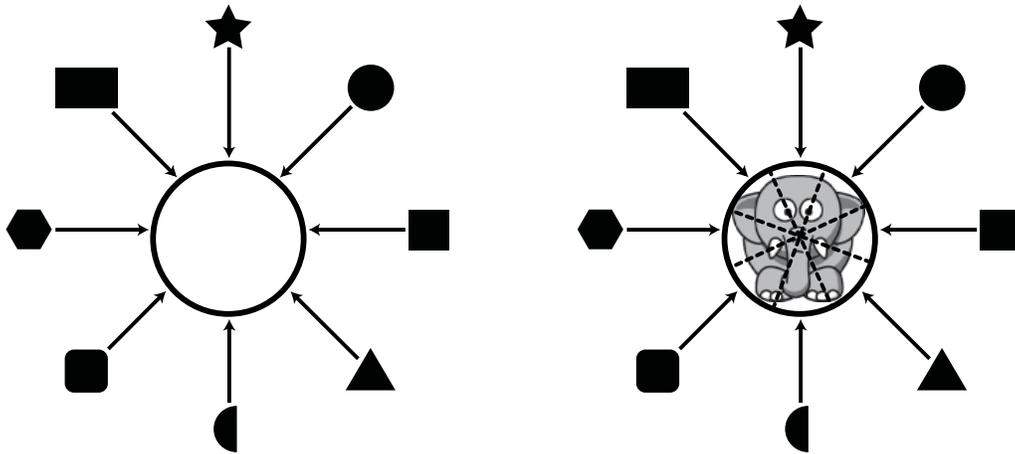
Figure 2. Epistemological pluralism (left) and *"elephant"* pluralism (right).

Some scholar-practitioners of Integral Theory go astray by overemphasizing multiple perspectives without simultaneously recognizing there are multiple objects correlated with those perspectives (and their respective methodologies). All too often we talk as if the multiple perspectives (e.g., worldviews represented by the altitudes) are all looking at the same object: epistemological pluralism (see Fig. 2, left). For example, individuals with various worldviews (traditional, modern, and postmodern) all are supposedly seeing CC via their unique structural lens. A common expression that captures the essence of epistemological pluralism is the Indian story of six blind men all touching different parts of the elephant and describing their parts but not realizing that each part forms a whole of a single object (i.e., the elephant) (see Fig. 2, right). So while this illustrative story has integral value, it only highlights one aspect of Integral Pluralism. The challenge is that there is not always just one pre-given elephant on the other end of each blind man (i.e., they actually enact a slightly different elephant depending on the methods they use). If they all use the same method, then they might indeed enact a single object, but if they use very different methods, then the probability increases that they will enact a multiple object. Keep in mind that even with the same method there are likely different perspectives and
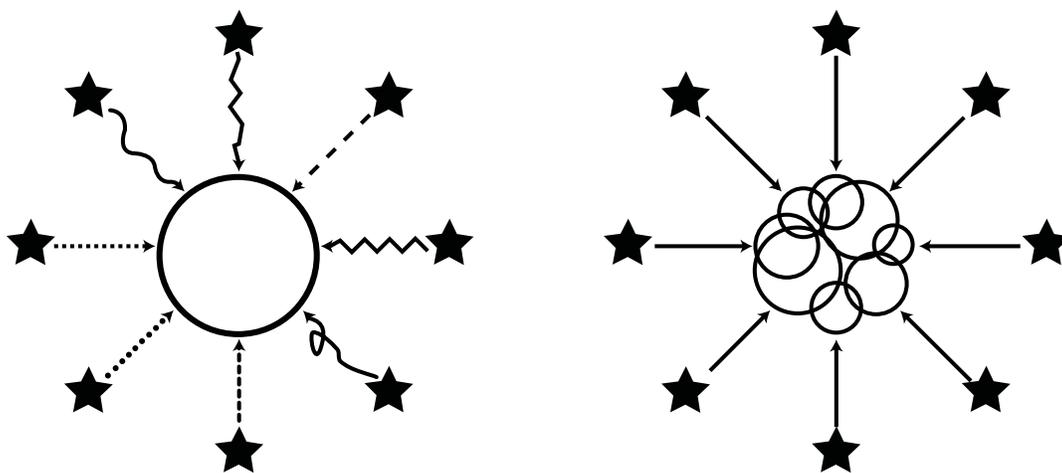

Figure 3. Methodological pluralism (left) and ontological pluralism (right).

worldviews on the user side of those methods. Thus, the risk of using the elephant and the blind men story is that if it is not situated within an Integral Pluralism context, it tends to reify the myth of the given by positing a single pre-given independent object, when in fact there might be a multiple object on the other end of the blind men and their methods.

As noted above, it is also common among scholar-practitioners of Integral Theory to talk about the different methods (e.g., the zones of IMP) being used to study the same object: methodological pluralism (see Fig. 3, left). For example, one might emphasize the value of an interdisciplinary or mixed-methods approach to the study of CC. But in this approach there is still often a lingering sense that there is a single object under investigation by individuals with largely the same perspective. In some cases individuals might combine an understanding of epistemological pluralism with methodological pluralism, which is quite a vision-logic performance. But even here a single object can be and is often posited even if a head nod is given to some vague sense of enactment.

In addition to discussing the various forms of epistemological and methodological pluralism that occur within integral contexts and discourse, I would like to make ontological pluralism a more explicit consideration and focus of integral theorizing and application. According to ontological pluralism, there are multiple criss-crossing and networked objects that correlate with actors and their methodologies (see Fig. 3, right). For example, ontological pluralism emphasizes that CC is not a single entity but rather a collection of third-person realities. This view would down play the role of various worldviews and practices involved in enacting objects and just emphasize the competing and overlapping single objects. For example, someone can highlight distinct third-person objects such as carbon emissions, arctic ice sheet thickness, or economic feedback loops without reference to the worldviews or injunctions behind the enactment of each of these realities or objects. It is as if the objects are just plain pre-given independent facts available to anyone.[31]

In short, we can talk about multiplicity and CC from either an epistemological, methodological, or ontological perspective. What is more, we can combine all three diagrams of multiplicity and present a view wherein there is multiplicity at each juncture in the enactment process (see Fig. 4). Here we have multiple Who's,
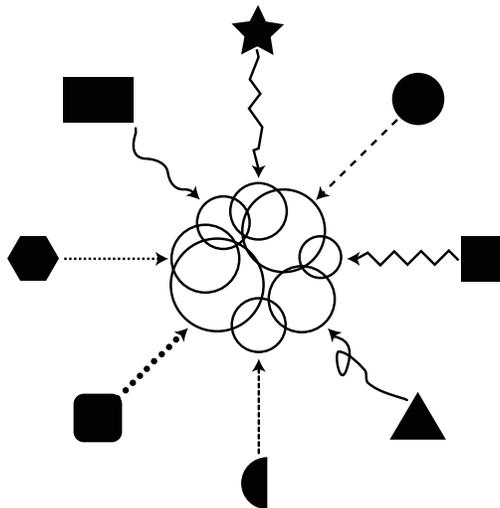

Figure 4. Integral Pluralism.

Subject
(Who)

Method
(How)
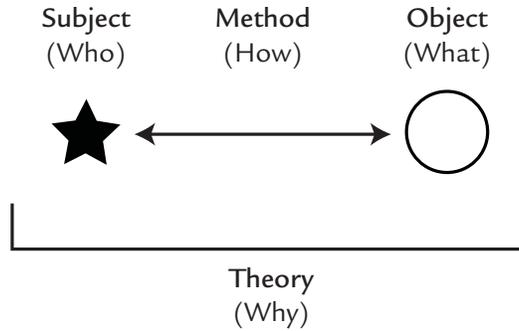
Object
(What)

Theory
(Why)

Figure 5. Integral enactment.

How's, and What's (see Fig. 5). So, in summary we have a simple version of integral enactment (Fig. 5) and a more complex version (Fig. 6)

In Figure 5, we see how enactment involves subject-method-object or Who-How-What co-arising and co-implicated. Note the line between them is a double arrow, indicating that causality moves in both directions and is not just a linear process of subject -> method -> object. This represents an enactive relationship between knowing and being, subject and object. Furthermore, the relationship between these elements is explained by a particular theory, or "the Why": the explanatory narrative that accounts for and enacts particular relations between subjects, the methods they use, and the objects they enact.[31] As Mark Edwards (2010) points out—drawing on Anthony Giddens' (1987) notion of a *double hermeneutic*— "Theory not only creates meaning, it also concretely informs and shapes its subject matter" (p. 42). In other words, theory is not merely interpretive but constitutive: theoretical pluralism lends itself to ontological pluralism. Thus, Integral Theory and the AQAL model has a particular way of enacting these three variables: Integral Epistemological Pluralism, Integral Methodological Pluralism, and Integral Ontological Pluralism.[32] Thus, Integral Theory is not just *psychoactive* for individuals (i.e., activating integral potentials in their own being as a result of engaging with the distinctions of Integral Theory), it is *enactive* for reality (i.e., activating integral potentials in the world as
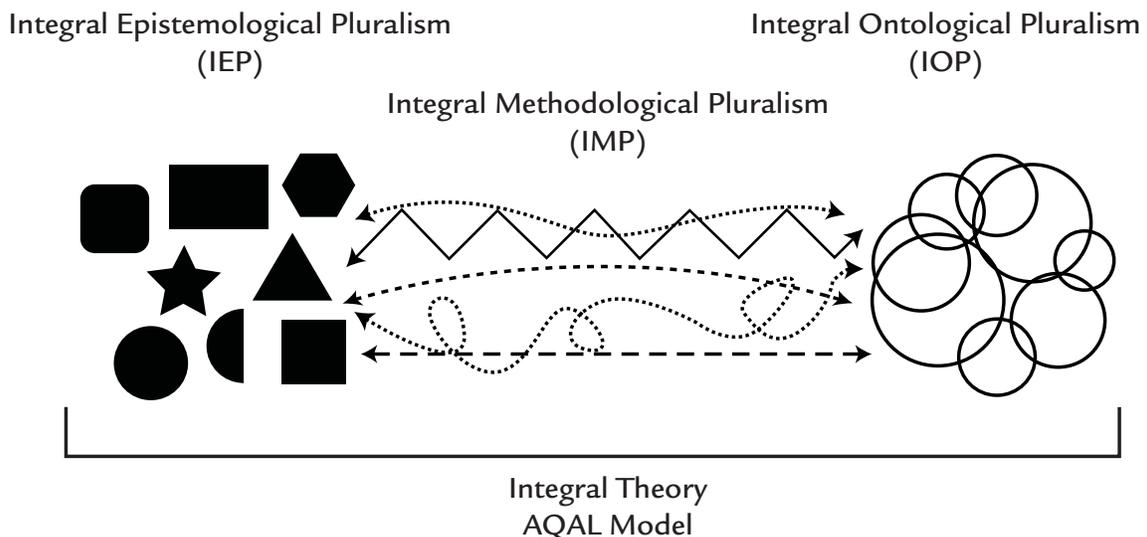
Integral Epistemological Pluralism
(IEP)

Integral Ontological Pluralism
(IOP)

Integral Methodological Pluralism
(IMP)

Integral Theory
AQAL Model

Figure 6. Integral Enactment Theory.

a result of engaging with reality in a particular way). As Wilber observes: "There is no singular phenomenon. It all is integral aperspectival. We perceive an integral world because we enact an integral world. One way we enact it is 'the Who' has an Integral framework—so here is a psychoactive framework that will help you enact an integral world 'out there'" (personal communication, March 16, 2010).

When I look at Figure 4 and 6's integrated visual representation of multiple Who's, multiple How's, and multiple What's, I get a powerful visual sense of what CC "looks" like. In some sense, the map starts to feel like it corresponds to "the reality," but we must keep in mind that this map is an enactment of the reality and not simply a representation of it. Having sketched out how I am enacting Integral Pluralism, let us take a closer look at how it serves us in understanding and responding to CC.[33]

Integral Pluralism and Climate Change

In this section, I want to show how a multiple object such as CC is best understood as a complex set of relationships between *epistemological distance* (the Who), *methodological variety* (the How), and *ontological complexity* (the What). In doing this I hope to demonstrate the value of using such an Integral framework to enact environmental phenomena, especially those that are global in nature.

In a stimulating article, "Ontological Politics: Mapping a Complex Environmental Problem," Michael Carolan (2004) uses critical realism and draws on many of the authors and works I have cited to model environmental problems from a perspective of ontological multiplicity.[34] In many respects, Carolan's piece was a culminating source of inspiration for this article. Carolan's work helped me see how to enact distinctions made by Mol and Law in the context of environmental phenomena.

Carolan (2004) points out that philosophers of science and sociologists have been discussing the notion of a "de-centered, multiple object" for more than a decade (p. 497). But he appears to be one of the few to point this discourse towards environmental phenomena.[35] The thrust of his article is to present a model of the "ontologically diverse nature of environmental problems today" (p. 497). As you will see, I have adapted his model to better support the distinctions associated with Integral Pluralism (see Fig. 8). He makes the important point that with respect to environmental issues, the epistemological issues and dimensions have been well explored by environmental sociologists and other scholars (e.g., via contested knowledge). He observes:

> Postmodernism, deconstructionism, and poststructuralism have been helpful (if for nothing else) in awakening us from the Enlightenment dream of the coherent, centered subject. But the perspectivalism that has since ensued, while multiplying observers, knowledge, and truth, leaves the object observed alone, untouched, and singular (Mol, 2002a). The goal, then is to find a way beyond mere perspectivalism without losing coherence; to reach ontological multiplicity without the fragmentation of postmodernism. (Carolan, 2004, p. 501)

As readers of this journal will recognize, this is very much the integral clarion call.

According to Carolan, the ontology of environmental issues is often taken for granted. He asks, "What if

multiple knowledges reflect not only varying positions but, in certain situations, a multiple ontology?" (p. 498). He introduces the notion of *epistemological distance* to highlight that some environmental facts "speak louder" than others. And I would add that some environmental facts are only enacted within certain, and in some cases more complex, worldviews. In addition to epistemological distance, Carolan points out that some environmental facts are more complex than others, a fact that I call *ontological complexity*. For example, a hot day is less ontologically complex than CC. That is, we are epistemologically closer to the ontological complexity of a hot day—we can experience it directly with our senses—than we are to a drought, which can be part of our direct experience but extends over space and time in many more ways than we can immediately see or experience (e.g., hydrological dynamics underground, certain weather dynamics). Both of these can be considered as part of a first order of ontology. Further out we have facts such as the current 385 parts per million (ppm) concentration of carbon dioxide in the troposphere. Such an environmental fact is not available to our direct senses—it is visible only in our mind's eye as a result of interpreting computer data. This falls into a second order of ontology. At an even higher level of abstraction (i.e., third order of ontology) is CC, which is built on many facts enacted within the second order. In summary, the first order is characterized by phenomena that we can more or less "see" with our own senses. The second order is the result of using various extensions of our senses (instruments, computer programs, charts) to see the phenomena. Carolan refers to this as *translation*, which indirectly allows us to see these phenomena. The third order cannot be seen with our senses nor indirectly by our instruments, but only by "indications":

> There are, however, no such comparable instruments or machines that can do our seeing of the object 'global warming' for us. Rather, we look for *indications* of the object's (global warming) presence in our attempts to 'see' it. We look at sea levels, carbon emissions, global mean atmospheric temperatures, and glacial thickness in our attempts to 'experience' this phenomenon—this thing—we refer to as 'global warming'. But are these things, in isolation or collectively, *the* object 'global warming'? (Carolan, 2004, p. 502)

Later on he explains:

> In the end, however while we may indirectly experience, say, rising mean atmospheric temperatures and increasing carbon in the atmosphere, these do not equal that which *is* global warming, at least not initially. *Translation* must first occur in our initial perception of these phenomena—through the machines, models, and computer printouts we employ. But then it must occur *again*, so as to translate these phenomena into that which *is* global warming. Given these factors, I have located global warming within the realm of a third order ontology: as something we indirectly experience indirectly. (Carolan, 2004 p. 504)

So CC is two steps removed from our direct experience (the first order) and our perception of it relies on many abstract indicators (the second order), which are epistemologically distant and ontologically complex.[36] Paul Edwards (2010) argues that everything we know about CC passes through a series of models. In particular, he identifies three kinds of computer models that account for all of our understanding of CC: *simulation models* used to map weather and climate, *reanalysis models* used to recreate climate histories based on historical data,

and *data models* used to integrate measurements from multiple sources.

Lost in Translation

Before continuing on with my discussion of Carolan's adapted chart (Fig. 8), I want to take a quick detour (in the spirit of pluralism) and present another illustration that makes a similar point to his. This chart comes from the work of Tim Forsyth (1998, 2001, 2003). Forsyth draws on critical realism, actor-network theory, and cultural theory in some creative ways to look at environmental hybridity (i.e., the inevitable blend of biophysical and cultural factors that comprise most environmental objects or phenomena).[37] As a result, he is an important resource for integral ecologists. Forsyth (2001) argues for a critical political ecology that "provides the means to integrate social constructivist approaches to environment while at the same time recognizing that the environment is certainly something more than these social constructions" (p. 154). In discussing hybrid science, he draws on terms from John Searle ("brute facts" and "institutional facts") to develop a typology of environmental problems (Fig. 7).

	Local	**Global**
"Brute Facts"	**1. Local physical variations** *(e.g., aridity, tectonic uplift, infiltration rates, soil erodibility)*	**2. Uniform physical properties** *(e.g., freezing points, thresholds of toxic pollution such as Persistent Organophosphate Pollutants)*
"Institutional Facts"	**3. Local cultural adaptions/problems** *(e.g., shifting cultivation, pastoralism, environmental vulnerability)*	**4. Globally-identified problems** *(e.g., global deforestation, anthropogenic climate change)*

Figure 7. Tim Forsyth's typology of environmental problems.

What is interesting about Forsyth's approach is that it presents another lens from which to understand how the translation Carolan points to occurs. In Carolan's approach, the translation occurs as we move into the second and third order of ontological complexity and have to rely on scientific instruments to "see" the data that serve as the signifier for global issues like CC. In contrast, for Forsyth it is a process of confusing, reducing, or leaving out any one of his cells (see Fig. 7). This is similar to the dynamics of the quadrants of Integral Theory (e.g., avoiding quadrant absolutisms or translating the LL through the LR). Forsyth (2001) explains two of the common mistakes that besiege efforts to integrate biophysical "facts" and social/cultural "facts" in environmental initiatives:

> In this diagram, environmental 'brute facts' (or biophysical properties) are divided locally or globally according to their universality over space. The 'institutional facts' (or definitions of degradation) are controlled by discursive practices. For example, both ozone depletion and climate change are commonly defined as 'global' problems yet their impacts (and causes) vary locally. This chapter has argued that too many orthodox environmental explanations have confused category 4 (discursively

constructed global problems) with category 2 (universal biophysical facts), and paid insufficient attention to category 3 (discursively constructed local problems). Alternatively, some postmodern approaches to environmental degradation (for example, Peet and Watts, 1996) have urged the adoption of category 3 without also acknowledging the influence of categories 1 and 2. The aim of realist political ecology is to increase awareness of how proposed explanations of environmental degradation may fall into each category, with the ambition of increasing local determination of environmental policy, and to avoid the potentially damaging impacts of policies based on assumed universal laws of nature. (pp. 153-154)

It should not surprise us that the two "lost in translation" dynamics that Forsyth cautions against are 1) realist and 2) relativist. An example of the first dynamic is scientists mistranslating category 4 with 2 (e.g., failing to see how CC is an enacted multiple object and instead positing it as a single object) and in the process leaving out cultural realities (categories 2 and 3). Conversely, the second example is that postmodernists often emphasize cultural realities while largely ignoring scientific insight (e.g., highlighting a relativist epistemology/ontology that fails to interface with universal and global features of the environment). By juxtaposing the conceptual lens represented in Figures 7 and 8, we can become more alert to the complex dynamics between different scales and framings of environmental problems and how to integrate those scales and framings with insights from both the social and natural sciences.
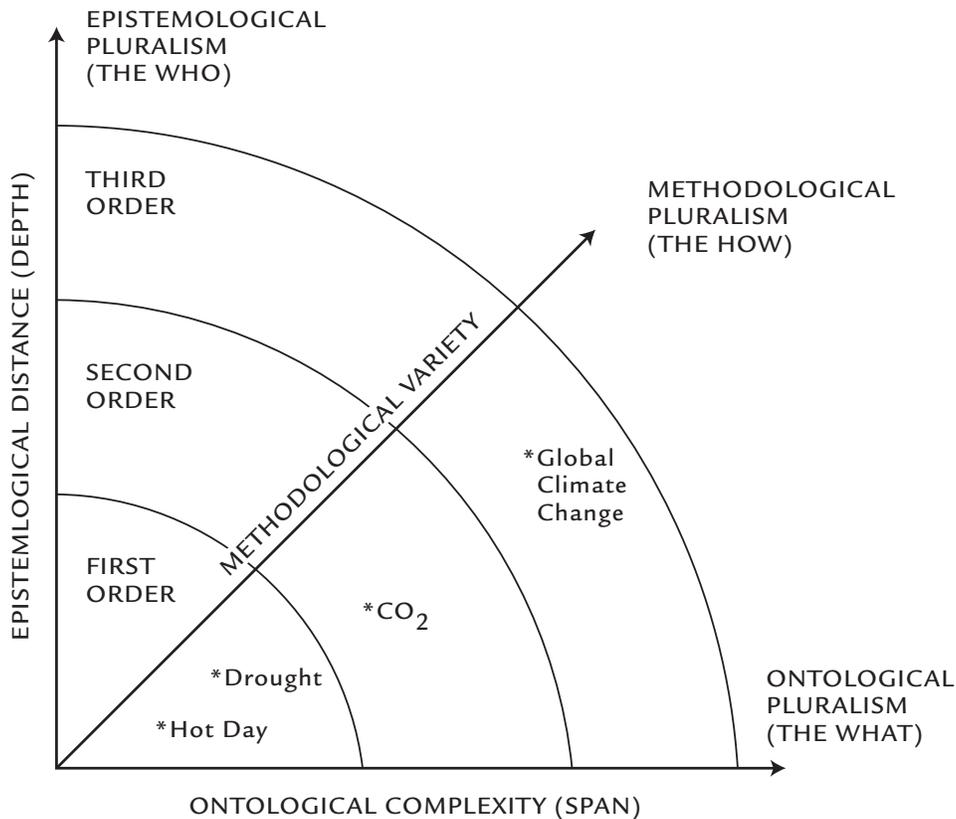

Figure 8. Integral Pluralism and climate change.[38]

Mapping Climate Change

Returning to Carolan, his chart (Fig. 8) uses two axes (x = complexity and y = epistemological distance) to map environmental problems. For him, "ontological multiplicity" is the result of increasing along both axes. He is clear that the existence of multiple objects does not leave us in some postmodern slump without any connection with the extra-human domain. Here Carolan (2004) is worth quoting at length:

> It is important to recognise that [critical realism] does not deny, nor question the existence of a material reality 'out there.' Dioxin does exist; as does litter. Global warming too has a materiality. Reality, however, is not enacted equally in every ontological order…. To 'see' the ozone layer requires, for example, satellite images (such as those from FASAT Bravo satellite) of earth's atmosphere. But such images are not the ozone layer—not until, at least, translation occurs.
>
> Through translation, reality shifts. But it shifts not because the materiality is itself fragmented, un-centered, and fluid….Rather, shifts in reality occur because the object itself has shifted. Remaining with the ozone layer example: through translation, the *is* of what we perceive changes from 'images of the earth's atmosphere from a polar orbit' to 'the ozone layer.' In other words, translation changes the *is*. This change is, I know subtle, but it happens. Through translation, 'rising mean atmospheric temperatures' become 'global warming' and 'positive plume tests' become 'dioxin.' In other words, the object changes through translation, but the (sub)structure of reality does not. (p. 505)

It is because of this last point that Carolan does not use words like "made" or "constructed" to describe this process. That would be to over emphasize epistemology and to neglect ontology. This is why Carolan and I use the word "enact" to describe what occurs. As Carolan (2004) explains: "This position is therefore *prima facie* a form of (critical) realism because translation presupposes the translation of some*thing* into some*thing* else" (p. 505). Hence the focus on ontology. Carolan goes on to do a great job of illustrating his complex and controversial points with reference to a case study of a "water problem" that takes place in the Klamath Basin of southern Oregon/northern California.

In addition to the two axes that Carolan uses, I have added a third that represents *methodological variety* (Fig. 8). So, the more epistemological distance and ontological complexity increase, the more methodological variety will increase. Thus, the more multiple an object becomes (the What), the more methods and disciplines you will need to study and make sense of it (the How), and the more perspectives there will be on what is or is not the nature of that object (the Who). As a result, the more dynamic an object is, the more pluralism results along any of the axes.

Furthermore, Carolan points out that the more we move along these axes, the more likely we are to frame an environmental issue as a problem. With this in mind, we can appreciate why CC is often construed as the biggest and most complex problem facing humanity. This is not surprising, given its epistemological distance is great (i.e., it is impossible to "see" it directly and therefore there are many competing perspectives on it) and it has much methodological variety (i.e., dozens of social and natural science disciplines are needed to

describe it). Given the degree of epistemological distance and methodological variety, it follows that CC has a high degree of ontological complexity (i.e., it is a multiple object). Thus, CC is what Carolan (2004) calls "a crisis multiple," which is "a single debate around a multiplicity of objects" (p. 208). Not to mention we could have a multiplicity of debates around a multiplicity of objects. So depending on whether people, for example, enact the problem of CC as a condition (e.g., the current amount of CO_2 in the atmosphere is 385 ppm) or as a process (e.g., human civilization has been contributing to CC ever since the Industrial Revolution), they are going to propose different solutions. Carolan (2004) suggests that the former will "more likely be enacted through (quick) technological fixes and those alone," whereas the latter will "more likely to [*sic*] be performed through actions and words that redress it historically, and have aims toward long-term systemic resolution" (p. 511). So, just with this short example we can begin to see how different worldviews and disciplines that frame CC in different ways will then enact different explanations and proposed solutions for dealing with their object of CC. This is why Integral Theory is so helpful with this "ontological coordination." It is for this reason that Carolan (2004) states, "We must therefore speak not just of multiplicity (as postmodernists have done with abandon for years), but also of how that multiplicity becomes coordinated into coherent, comprehendible wholes" (pp. 517-518). This is why the Integral Pluralism framework and Integral Enactment Theory I have presented in this article are so worthwhile in the context of CC.

So, in the context of ontological pluralism we have explored the enactment of CC as a multiple object. Now we have an Integral Pluralism framework (represented in part in Fig. 8) that shows the relationship between the Who, the How, and the What of environmental phenomena ranging from the simple to the complex. In closing, I will summarize some of the advantages of this approach for addressing CC in particular and other complex environmental problems in general.

The Value of Ontological Plurality for Climate Change

This article presents a number of reasons why it is advantageous—philosophically and pragmatically—to relate to CC as an ontological plurality (within an integral pluralism). By and large, viewing CC as a single, pre-existing, independent object has not proved very successful in coordinating, mobilizing, and responding to the urgency of the situation—urgent in the sense that regardless of whether one thinks that we are headed for an apocalyptic collapse in 2 to 10 years or that we will slowly deal with mitigation and adaptation over the next 100 years, there is value in finding creative solutions to CC issues sooner rather than later. The Integral approach keeps in mind that there are a number of perspectives that interpret the CC situation as considerably less urgent than it is depicted by others. While there can be advantages to enacting CC as a singular object, in spite of its reductionism (e.g., doing so can help mobilize grassroots activism around the world, as we have seen with Bill McKibben's 350.org initiative), there are also advantages to enacting it as a multiple object. I will discuss five:

1. The Integral Pluralism framework supports the identification of key leverage points within a dynamic landscape of actors, methods, and ontologies. By being able to map out more of the active ingredients of enacting CC, we increase the sites of intervention and climate leadership. The resulting picture matches more accurately how CC is currently being enacted. In short, this "right view" lends itself to "right action." So, while an approach like the one outlined above places

heavy cognitive, interpersonal, and moral demands on the climate leader, it takes a relatively small number of such leaders who can work with the complexity of Integral Pluralism to have a large-scale effect worldwide.

2. Climate change is such a complex and elusive object that we need to be working on multiple fronts simultaneously. The Integral Pluralism framework helps us identify the variables of Who, How, and What that can independently or in conjunction be worked with to help enact more effective understandings and solutions. We need to be responding to CC at various scales with a range of time-frames in mind from many divergent disciplines and their associated injunctions and scientific practices. Integral models are needed to coordinate these various activities (see Inglis, 2008, p. 501).

3. The Integral Pluralism framework helps coordinate all of the pluralisms discussed above (IEP, IMP, IOP, and ITP). This can provide a much-needed coordinating effort across the many factors and elements involved. It is not easy to hold together the many Who's, How's, and What's involved, but the framework offers a flexible procedure for locating Kosmic addresses and their relationships to one another. In this vein, maybe we should be talking about a Kosmic Positioning System (KPS). An important part of this coordinating process would be providing spaces and processes for negotiation, debate, and the cultivation of mutual understanding. Given the forms of pluralism involved here, it becomes paramount that various forms of agreement be established as to what CC is or is not in specific contexts. Given all the worldviews, methodologies, and aspects of CC, it seems unlikely that that there will ever be a "global consensus"—rather there will be networks of understanding that contain dissenting views and opposite opinions at various scales and within a range of contexts. These kinds of networked agreements will serve as a basis for how we research, respond to, and model CC. In the midst of all of these pluralisms there needs to be a way of integrating and differentiating all the perspectives involved. Integral Theory provides a number of elements and a lens to begin to develop such a process.[39]

4. The Integral Pluralism framework reminds us that enactment entails ontological ethics. We can enact or erode different CC realities depending on the injunctions and methods we take up individually and collectively. These different realities have ethical implications. For example, as we enact our responses to CC, we can be more aware of the social practices we want to develop or embrace that serve worldcentric and planetcentric aims. Applying Integral Pluralism to CC can serve as a testing ground for learning how to approach other complex global phenomena as multiple objects. CC is likely just the first of a long string of global issues we will face as a planetary community, so there is an ethical imperative to learn how to address such multifaceted realities in a complex and integrated fashion.

5. The Integral Pluralism framework allows us to be more effective in dealing with the various realities of CC. This is because the IP framework provides a more so-

phisticated view of how CC comes into being. If we treat it as a single object, we might have success with that one object while leaving all the other objects of CC unaddressed. Then we will be scratching our head wondering why we haven't solved the issue. For example, even if we were able in the near future to hit the 350 ppm mark (around which McKibben has been so successful at mobilizing people and organizations), there is good reason to think that the issue of CC will not go away. We will have just dealt with one of the many objects of CC—the 350 ppm object. But many others will remain, such as eco-anxiety, international treaty enforcement, energy consumption, and divergent worldview concepts of nature. There is not one solution to climate change because there is not one problem. Climate change is a complex network of many problems, and as such it will require a complex network of many solutions—many actors working on many fronts concurrently. In summary, enacting CC as a multiple object supports us in avoiding reducing its multiplicity to a singularity and thereby working on only one front of a many-front endeavor.

As you can see, there are many good reasons for recognizing the value of exploring ontological plurality in the context of CC. The ontological status of such a global phenomenon should not be taken for granted. We need to explore in detail the ontological commitments of our current assumptions and approaches. It has become more common to talk about and include epistemological pluralism (e.g., various worldviews or different personality types), and it is becoming more acceptable to talk about and include methodological pluralism (e.g., mixed methods research or interdisciplinary research teams). Now it needs to become more acceptable to talk about and include ontological pluralism (e.g., multiple objects and hybrid objects). I hope this article helps to enact new conversations and applications that explore the value and limits of approaching CC as an enacted multiple object.

In conclusion, Integral Pluralism provides a unique framework for coordinating the multiple perspectives and dimensions that are enacted through Integral Epistemological Pluralism, Integral Methodological Pluralism, and Integral Ontological Pluralism within a context of Integral Theoretical Pluralism. While sophisticated, such a framework can be quite useful for addressing the multi-variant nature of a complex global phenomenon such as CC. It will take many years to flesh out the details of this approach, but Integral Theory already offers us a substantial platform from which to begin enacting Integral Pluralism and developing an Integral Enactment Theory.

Acknowledgments

NOTES

[1] Carolan (2004, p. 513).

[2] Another environmental issue that could be explored from a multiple object perspective is the status of species. There is widespread scientific debate and disagreement as to what a species is or even if it is a useful construct. Depending on which source you cite, there are between 5 and 26 viable and established species concepts (see Hey, 2006; Mayden, 1997; Purvis et al., 2000; Stamos, 2004; Wheeler & Meier, 2000; and Wilkins, 2009a, 2009b). Also, see Brad Allenby's (2005a, 2005b, 2005c) three-part discussion of the ontological pluralism of biodiversity. Clearly, the ontological status of species is an extremely difficult and important issue for any understanding of biodiversity. Is "species" a term of classification? Is it a reference to a population of similar organism that endures over time? Is it a higher-order, more fundamental, and even more "valuable" aspect of reality than the individuals that instantiate them? These and other difficult species issues need to be more fully engaged, and I feel the framework of Integral Pluralism presented in this article can provide much to such an endeavor. Such a framework could also be used to address the ontological multiplicity of ecosystems as well as a host of other complex and elusive environmental realities.

[3] As this article was going to press, I received a copy of the recently published anthology by Roy Bhaskar and colleagues on CC (Bhaskar et al., 2010). While I have not had time to read this volume, a cursory glance through it indicates that it has much to offer an inquiry into the ontological dimensions of CC. In fact, the volume places ontology at the center of the discussion and does so in a way quite consistent with Integral Theory. Notice the language found on the first page of the introduction:

> Even those who see climate change as an urgent issue, for the most part, lack a framework for coherently integrating the findings of distinct sciences, on the one hand and for integrating those findings with political discourse and action, on the other. This volume addresses a wide sweep of these issues of integration, ranging from integration across (relatively) adjacent sciences; between physical sciences and social sciences;….In addition, this volume contains a number of detailed critiques of the undermining effects of lack of integration in some crucial fields of knowledge such as planning, economics and the policy/ civil society interface in relation to climate change. (Bhaskar et al., 2010, p. vii)

Many concepts and distinctions within critical realism share an uncanny resemblance to ideas within Integral Theory. For example, Bhaskar's notion of a "four-planar social being" and his seven levels or scales of hierarchy echo Integral Theory's own all-quadrants, all-levels approach. Given the integrative similarities between critical realism and Integral Theory, it would be quite interesting to do a comparison of the 13 chapters of Bhaskar et al.'s book with the 14 articles in the special double issue of JITP devoted to climate change, of which this article is a part.

[4] Here and throughout this article I use "object" and "phenomenon" interchangeably. In either case, the emphasis is on third-person status as a signified (i.e., an extra-human phenomenon, that is not merely a human construct). One of the values of using "object" (opposed to "phenomenon") in this context is that it carries a connotation of some *thing* or entity with a discrete boundary that is typically tangible via one's senses. While a global phenomenon like CC is not the kind of object you can set on a table, it still is a thing that has discrete boundaries (established by various methods of analysis) and is tangible via extensions of the senses. In fact, later in the article I will discuss the notion of ontological complexity, which presents three orders of ontological status from a hot day (first order) to CO_2 (second order) to global CC (third order). As will be explored, each successive ontological order becomes more removed from our direct sensory encounter with the world and we have to rely on the translation of data into an "object." Another advantage to using "object" is that objects are correlated with subjects and furthermore with methods. Also, individuals often talk about CC as if it is an object—an external thing that is out there or that CC is the object of scientific investigation. So there are many ways in which to consider CC as an object.

[5] Throughout this article, *multiple objects* should be read as the plural form of *multiple object*—in contrast to *multiple objects* (e.g., a collection of single objects that are ontologically straightforward and do not require more than one method to "see").

[6] Note that the Who can either be an individual or a collective, depending on the context.

[7] The term ontological pluralism is often contrasted with forms of monism (e.g., Drake, 1926) and has philosophical roots that reach back to pre-Socratics such as Empedocles. The history of western philosophy contains many forms of ontological pluralism and deserves more attention than what this article can provide. The term is often associated with Rudolf Carnap and neo-Carnap figures like Eli Hirsh and Hilary Putnam (see Eklund, 2009). For a good overview of ontology, see Jacquette (2002), and for a contemporary and meta-view of ontology, see Chalmers et al. (2009).

[8] Each of these discourses have much in common with Integral Theory and therefore have much to offer its further development and clarification. One of the things that sets Integral Theory—and the Integral Pluralism I present in this article—apart is that of a meta-framework that helps coordinate epistemological, methodological, and ontological variables and their complex interrelationships. This is at least one contribution that Integral Theory has above and beyond these forms of discourse. Even critical realism does not offer, in my mind, as powerful and as accessible a framework for doing this.

[9] Each of these fields of discourse and practice are rich sources for Integral Theory to further develop the notion of ontological pluralism as well as other key distinctions and integral principles. For example, critical realism has developed a sophisticated view of ontology and realism that goes beyond positivism and relativism. Like Integral Theory, critical realism identifies itself as that which will come after postmodernism and it proposes to do so by integrating the partial truths of modernism and postmodernism (e.g., see Lopez & Potter, 2001). Furthermore, critical realism has been applied to a wide range of disciplines (e.g., Cruickshank, 2003) in a similar fashion as Integral Theory. In many respects, critical realism is a viable integral alternative to Integral Theory and as such integral scholar-practitioners will benefit from a more direct engagement with its distinctions and applications.

Farias and Bender (2010) apply actor-network theory to the notion of "urban assemblages," exploring how the boundaries between what Integral Theory calls individual holons, social holons, and artifacts are enacted in complex and overlapping ways that often do not conform to Integral Theory's categories. For example, in actor-network theory, agency is granted to artifacts through a network of causation and not just to individual subjects. In fact, artifacts are actor-networks, simultaneously a network and an actor. In this context they treat the cityscape as a multiple and overlapping enactment. See Harman (2009) for a valuable presentation of Latour's process metaphysics of enactment. Suffice it to say there is much in Latour's work that is relevant to an integral post-metaphysics.

Law and Mol (2002) provide a number of illustrative examples of complexity, enactment, and multiplicity. Each of these exemplify aspects of an integral analysis that is instructive and illuminating to proponents of Integral Theory, particularly in terms of their injunctive language and emphasis on social practices.

[10] See Wilber (2000, pp. 560-561, n.49; 568-570, n.13; 590-595, n.43; 734-741) for an extensive discussion of Varela's enactive paradigm and its limits from an Integral Theory perspective.

[11] Ever since Kant pointed out that our structures of being are constitutive of the world, we have found ourselves grappling with the philosophical and pragmatic implications of the notion of enactment. Integral Theory situates its approach to enactment within an Integral Semiotics. This developmental approach to semiotics draws heavily on the pan-semiotic perspective of C.S. Peirce (1958) and the field of biosemiotics. A full discussion of enactment and ontology in this larger context extends beyond the bounds of this article.

[12] I have enacted this article within the theoretical context of Integral Theory. Within this context I have brought my own background and embodied structures of consciousness (the Who); taken up an integrative synthesis of insight from critical realism, actor-network theory, science and technology studies, and ontological politics (the How); and focused on the global phenomenon of CC as an exemplar of a multiple object (the What). Note there is a fractal quality to examining any one of the three variables. For example, to examine my own "Who" out of a commitment to reflexivity would involve myself (the Who) using some methods (the How) to examine myself (the What).

[13] There are limits to this example, but it should serve to illustrate the direction we are headed. As the article progresses, I will introduce more concepts that will nuance and alter how we related to this example.

[14] I would like to thank Mark Edwards for the suggestion of this example.

[15] The notion of ontological pluralism is also implicit in the field of future studies, as Chris Riedy recently observed:

> I think the futures community, particularly the integral futures community, is very comfortable and familiar with the concept of ontological pluralism. When you adopt a futures orientation, you jettison singular realities and adopt an assumption that, through our actions in the present, we can create different futures. It seems to me that futures thinking implicitly assumes ontological pluralism and there could be value in drawing out these parallels. (personal communication, March 12, 2010).

[16] In addition to these three, there is a fourth important form of pluralism: Integral Theoretical Pluralism (ITP). The notion of this emerged jointly (was enacted) in conversation between myself and Mark Edwards. I see ITP at three scales: 1) micro (e.g., how Integral Theory includes a pluralism of unit-level theories in its meta-framework); 2) mesno (e.g., how within Integral Theory there can be a pluralism of approaches to the AQAL model); and 3) meta (e.g., a diversity of metatheories of which Integral Theory is but one). For discussion of theoretical pluralism, see Abend (2008), Dongping (2010), Moller (2007), and Tuana (1993). In addition to ITP, Edwards points out that there are other important pluralisms that could be included, such as Integral Axiology Pluralism (e.g., multiple values underlying the model) and Integral Soteriology Pluralism (e.g., multiple emancipatory aims and assumptions of a model) (personal communication, March 5, 2010).

[17] In short, Integral Enactment Theory (IET) is a post-metaphysical approach that provides a meta-view of how *at least* four types of pluralism (IEP, IMP, IOP, and ITP) *en-ter-act* to generate reality. As implied in the text, IET draws heavily on Integral Theory as well as approaches such as integral meta-studies, critical realism, and meta-Reality, science and technology studies, and actor-network theory. One way to conceive of IET is that it is a meta-field of Integral Theory (opposed to a subfield like Integral Ecology or Integral Psychotherapy). As such it is a field that is anchored in Integral Theory and therefore a deepening and extension of it. And at the same time it reaches above and beyond Integral Theory to draw on other valuable enactive and integrative pluralistic approaches to articulate a sophisticated understanding of the complexities of enactment.

[18] For those less familiar with Integral Methodological Pluralism, the following methodological families are associated with each zone: phenomenology (Z1), structuralism (Z2), hermeneutics (Z3), ethnomethodology (Z4), autopoiesis (Z5), empiricism (Z6), social autopoiesis (Z7), and systems theory (Z8).

[19] Any number of professions could be listed in Table 1. I have selected a handful that feel particularly illustrative of the enactment of CC. I have chosen not to present disciplines in the Who column because I want to emphasize the individual subject (the Who) over the general discipline (the How). Obviously, a climatologist is part of the discipline of climatology and has been trained in the various methods of analysis associated with it. Thus, I am trying to use the Who and the How columns to tease apart the individual's subjectivity and their preferred methods of enactment.

[20] Law (2004, pp. 60-61, 74-75) identifies two kinds of strategies for producing/enacting singularity: *perspectival* (i.e., layering, producing a single smooth narrative, the use of translations, the use of hierarchies, and rationalizations) and *non-perspectival* (i.e., maintaining mutually exclusive sites of examination, keeping certain realities apart, creating composite objects, and creating different objects). While it is beyond the scope of this article, it would be valuable to examine CC discourse and action in light of these strategies.

[21] Wilber (2006) explains:

> And here, "**exist**" means "**ex-ist**": to stand out, to be known, to be disclosed, to be tetra-enacted—anything except being part of a pregiven world lying around out there waiting to

be perceived. Part of an object's Kosmic address is the fact that objects come into being, or ar enacted, only at various developmental levels of complexity and consciousness. Whether they exist in some other way CANNOT BE KNOWN in any event, and assuming that they do exist entirely independently of a knowing mind is nothing but the myth of the given and the representational paradigm—that is, is just another type of metaphysical thinking and thus not adequeately grounded. At any event, post-metaphysical thinking does not rely on the existence of a pre-given world and the myth of that givenness. (pp. 251-252).

In reviewing this article, Wilber explained, "This is why I use the word *sub-sist.* There is a reality or a What that subsists and has intrinsic features but it doesn't *ex-ist* without a Who and a How. So that is where Integral Pluralism in general comes into being: it is bringing forth a reality but it is not creating the reality à la subjective idealism" (personal communication, March 16, 2010). Also see Wilber (2006, pp. 250-251) for a discussion of the difference between subjective idealism and what I am calling Integral Pluralism. In short, subjective idealism is an exclusive focus on the Who, where it determines or is primary to the How and the What. In Integral Pluralism, all three are mutually implicated in each other.

In short, we cannot create or enact any reality we want. There is not "an indefinite reality-complex (n-object set) that is sliced up by different injunctions to yield a now-definite set of realities (multiple n-object sets)" (Z. Stein, personal communication, March 3, 2010). Rather, the object or sets are tied to the injunctions and their enacted realities overlap. Recall this is not relativism, which would allow for discontinuity in enacted realities (i.e., the position that every method reveals a different incomensurable reality). Simply put, Integral Pluralism is the middle path between positivism and relativism.

[22] In fact, there are many objects that defy or extend beyond the containment afforded by a single method. And not all of these objects are as complex as CC, which has a high degree of epistemological distance and methodological variety. For example, see the discussion of "no single tree" in Esbjörn-Hargens & Zimmerman (2009, pp. 174-181).

[23] The Who x How x What is a version of Wilber's own enactment formula of quadrant x quadrivium x domain (i.e., I/We x method x subject or object being enacted). For some other variations on this formula, see Esbjörn-Hargens & Zimmerman (2009a, p. 629, n. 26).

In addition to the Who, How, and What, Brian Eddy (2008) has pointed out that there is also a Where and a When (also see Esbjörn-Hargens & Zimmerman, 2009a, p. 599, n. 10). These two variables provide a spatial and temporal dimension that can be used in any of the three contexts (e.g., the Where and When of the Who and the How and the What) or as a fourth and fifth variable (e.g., W x H x W x W x W). After discussing my triadic structure of enactment, Eddy (2008) explains:

> The utility in adding questions of 'where' and 'when' (space-time coupling) is an essential aspect for the *contextualization* of knowledge, and is essentially where geographical inquiry offers its main contribution…. In particular, the emphasis is on how space-time boundaries and local-global nesting are contextualized within the epistemological (Who), methodological (How), and ontological (What) dimensions. It requires researchers to also ask questions of the type: '*To what geographic scales and locations does this kowledge apply?*' or '*Is this knowledge true for all time and all locations, or does it hold only under specific geographical conditions?*' (p. 188)

In reading an early draft of this article, Eddy commented:

> I think it is worth giving more consideration to the 'spatial' and 'temporal' dimensions to the multiple object and the dynamics involved. It does fit well with Figure 9—in that as

these multiple objects change dynamically in space and time (and are perceived/observed across different spatial and temporal scales), so too does this make framing the Who, How and What more challenging and even more plural/multiplistic (i.e., by adding/considering the 'where' and 'when'). (personal communication, March 10, 2010).

[24] Mark Edwards pointed out to me—and I completely agree—that it is important to keep in mind that an approach to Kosmic addresses is enacting those addresses in a particular way. Integral Theory needs to spend more time developing and justifying how it has arrived at its own Kosmic address mailing system and how this system establishes its own system of addresses. Edwards is understandably suspicious of Integral Theory's capacity to do this adequately: "No one system is up to this task. Hence the ultimately inadequate nature of all mailing systems. Only when all the partialities of the inadequate address systems are combined (including AQAL) can the process of communication (sending mail) somehow occur. AQAL by itself can't represent this Integral (Meta)Theoretical Pluralism process." (M. Edwards, personal communication, March 8, 2010). This is an important critique that will need to be attended to.

[25] A case could be made for the Kosmic address of when CC became a public (multiple) object in the 2000s (green altitude environmentalists x UL Gaia religion combined with LR systems science x LR atmosphere). Or one could make a case for the Kosmic address of when CC is enacted in a way that approximates its complexity most fully (turquoise scientists x mixed methods x NATURE).

[26] In reviewing this article, Chris Riedy stated: "This is a great term. I now realize I've been engaged in ontological politics for years, trying to enact CC as a moral, cultural and political issue rather than a technical issue. The research on communicating CC and framing starts to touch on this a bit—the way we frame CC in our communications creates different realities that are more or less conducive to action." (personal communication, March 11, 2010).

[27] Law & Urry (2003 p. 10) list six qualities of many 21st-century realities that are ill accounted for in current modern and postmodern methodologies. These include: *fleeting, distributed, multiple, sensory, emotional,* and *kinesthetic*.

[28] Law (2004, p. 25) also lists *constancy, passivity*, and *universalism*.

[29] The making of particular statements about realities can also be equated with a particular theory (the Why) behind the statements. (M. Edwards, personal communication, March 8, 2010).

[30] See endnote 15 for more details.

[31] I would like to thank Mark Edwards for suggesting the use of "the Why" in this context.

[32] Integral Theoretical Pluralism (ITP) is an important part of how I am presenting Integral Pluralism in this article, in part because it highlights the enactive nature of theories and metatheories. This double hermeneutic must be addressed, I believe, if we are to have a fully reflective, recursive, and post-metaphysical view of enactment.

Also, I promote a plurality of AQAL enactments similar to M. Edwards' (2010) embrace of a plurality of meta-frameworks. In this sense I actually feel the notion of ITP serves my goal of diversifying the Integral Theory landscape and minimizes a singular focus on Wilber's own enactments (as wonderful as they might be) of integral principles. Different integral scholar-practitioners will all enact a particular kind of AQAL—the similarities and differences of this "multiple object" would be worth a fuller investigation.

In this sense, I am in favor of messy pluralism, which is why I like the work of John Law and others referenced in this article who complicate the landscape. I am not in favor of a rigid AQAL grid. Through my various academic activities, I am trying to enact a very different Integral Theory than the one I think many feel familiar with. My focus takes Integral Theory more in the direction of the work M. Edwards (2010) is doing with integral meta-studies.

In short, the Integral Pluralism framework and Integral Enactment Theory that I am advancing in this article situates Integral Theory and its AQAL model into a larger enactive context than what has hitherto been associated with Wilber's work. In a sense, Integral Pluralism stands for a pluralism of Wilberian Integral Theories and a pluralism of AQAL models. In other words, I want to work within the parameters of Integral Theory as based on the pioneering work of Ken Wilber, but do so in a way that develops this meta-framework in enactive dialogue with other meta-

frameworks and transdisciplinary insights.

[33] To be clear, as noted in endnote 8, I and my particular AQAL constellation (the Who) am enacting Integral Pluralism by using distinctions from Integral Theory combined with distinctions from critical realism, science and technology studies, and actor-network theory in a particular way (the How) to examine CC (the What).

[34] Carolan teaches at Colorado State University in the department of sociology. He is a prolific writer and has produced a number of important articles exploring issues of critical realism, values, scientific knowledge, sociology, representational knowledge, and epistemic barriers. Given the centrality of his work for inspiring much of this article, I encourage integral scholars to draw on his other writings to further develop some of the ideas presented here. For a sampling of some of his work, see Carolan (2005a, 2005b, 2006a, 2006b, 2006c, 2006d, 2006e, 2006f, 2006g, 2007, 2008a, 2008b, 2008c, 2008d, 2008e).

[35] Below I provide additional examples of individuals discussing multiple, de-centered, or hybrid objects in an ecological or environmental context.

I highly recommend Hulme's (2009) book, *Why We Disagree About Climate Change*. He does a great job of including interiors (psychology and culture) and exploring interdisciplinary views on CC. He has a background in modeling CC and scenarios work. In particular, see Hulme (in press, 2008a, 2008b; Hulme, et al., 2009; Lorenzoni & Hulme 2009; O'Neill et al., in press). For a full bibliography of his important work, see http://mikehulme.org/wp-content/uploads/2009/12/Hulme-Publications-January-2010.pdf. Also see Michael Zimmerman's review of *Why We Disagree About Climate Change* in this issue (pp. 175-184).

A number of individuals are working explicitly within various contexts from a critical realist perspective: climate change (Bashkar et al , 2010); interdisiciplinarity and ecological theory (Hoyer & Naess, 2008); feminist environmentalism (Jackson, 1997); ecological psychology and language (Fettes, 1999); animal rights (Benton,1996); environmental risk (Oelofse, 2003); and science education (Zembylas, 2006). All of these sources are instructive on many of the positions advanced in this article.

N. Katherine Hayles (1995) provides a useful discussion of "constrained constructivism" and "interactivity" that charts a middle path between objectivism and social constructivism. Not surprisingly, such a position tends to make enemies on both sides of the divide. She notes that on the one hand scientists and environmentalists feel uncomfortable in incorporating constructivist insights. On the other hand, social constructivists feel like she is "conceding too much to realism" (p. 61). Throughout her essay she associates reflectivity and positionality with "strong objectivity" as opposed to a kind of infinite solipsistic regression. This echoes many of my points above about Kosmic address. In fact, the entire volume from which her chapter comes (Soule & Lease, 1995) is worth mentioning, as it explores responses to the deconstruction of "nature" at the hands of postmodernists.

The post-humanist Cary Wolfe has done some interesting and valuable work at the crossroads of systems theory and postmodern thought (see Wolfe, 1998; Rash & Wolfe, 2000). His work is particularly of value in exploring an approach to realism that is informed by postmodern thought.

[36] In addition to this double abstraction, CC is also difficult to see because it requires meta-systemic cognition to enact it as a global holarchical systemic phenomenon (see Esbjörn-Hargens & Zimmerman, 2009, pp. 174-181).

[37] Also see Grove (2009) for a useful discussion of hybridity in the context of urban political ecology. Grove's article has much in common with Forsyth' work and does a good job of including first-person subjectivity in the context of a case study built around a watershed.

[38] This figure is adapted and expanded from Carolan (2004, p. 503).

[39] In particular, Integral Theory uses 12 levels of altitude to help coordinate the Who (epistemological coordination), 8 zones to help coordinte the How (methodlogical coordination), and 4 quadrants (or 12 niches) to help coordinate the What (ontological coordination). These are not the only coordinating elements within Integral Theory, but by naming them here they provide an illustration of how the AQAL model supports the coordination of pluralism. Other integrative frameworks and lenses can and should be used. Those mentioned above are just representative of what it can look like (i.e., one way to enact integral coordination).

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SEAN ESBJÖRN-HARGENS, Ph.D., is associate professor and founding chair of the Department of Integral Theory at John F. Kennedy University in Pleasant Hill, California. A prominent scholar-practitioner in Integral Theory, he is founder and executive editor of the *Journal of Integral Theory and Practice* and founding director of the Integral Research Center. He has published extensively on the applications of the Integral model in a variety of areas. He is a practitioner within Tibetan Buddhism and the Diamond Approach and lives in Sebastopol, California, on five acres of redwoods with his wife and two daughters. Sean is an Integral Coach® and consultant through Rhizome Designs (www.rhizomedesigns).