The Data and Methodologies of Integral Science

Kurt Koller

This essay introduces a methodology for Integral Science called Integral Methodological Pluralism (IMP). Tracing the development of epistemological and ontological relationships in the writings of Ken Wilber, the paper demonstrates how such a methodology might be applied. I consider Wilber's elucidations of three core principles of valid knowledge (injunction, apprehension, and consensual validation) along with three essential elements of an IMP (nonexclusion, enfoldment, and enactment).

Introduction

In an earlier work, I made an effort to guide the construction of a "living laboratory" of Integral Science.[1] I identified the essential elements of design, data, and methodology (along with the Integral scientists themselves), though I only explored the design element in detail. This work begins where the last left off, with a look at the data and methodologies involved in Integral Science.

Critical to forming an adequate Integral Science are the elucidation of valid data and the identification of methodologies that produce or illumine that data.[2] Data is a basic substrate of our experience, a foundation for our inferences, models, laws, and theories. Thus, what we choose to accept as data immediately impacts what we accept as foundational elements of our Science. If data do not register in our awareness, we can hardly account for it in our Science: we cannot make use of data if we cannot "see" it in the first place; we cannot figure out how data are related if we have excluded it from the start. One cannot work with data which one does not cognize. So, this is our first challenge: how do we gather as complete a data set as possible so that we might construct the best, most complete structures for our Science?

Gathering data is a matter of method. Method is essentially a "doing": we do something to enact an experience. And that experience is precisely what I am calling data. Generally speaking, the more methods we can include, the merrier (i.e., the less likely we will miss something of importance). In pursuing our data, however, we have certain limitations to contend with. We have limited time and resources, there are methods that we will chose not to pursue, and we have to make sense of the data at some point. We also know that all data are not created equal—some data are more valid than other and we will need to adjudicate which data are more approximately true than others. And this presents our second challenge: which guidance system—which methodology—will best aid us in selecting solid methods, judging the validity of data, and organizing our data in a coherent framework?

So, we have two tasks. The first is an investigation of data: what it is, how it is structured, how do we get it? And the second task, closely related to the first, is an investigation of a methodology adequate to our data collections—a methodology that allows for sound cognitive judgments befitting an Integral Science.

This article is one part overview and one part reconstruction. The overview consists of exploring a series of Ken Wilber's writings on data and methodology that delineate elements of what Wilber has called an Integral Methodological Pluralism.[3] The reconstruction consists of an attempt to further elucidate and trace these elements as they appear in the development of Wilber's thoughts on data and methodology.

We will look at the core elements of Integral Methodological Pluralism and thereafter proceed to the first two chapters of Ken Wilber's work *Eye to Eye: The Quest for the New Paradigm*, a pair of essays that identify three methodological principles common to all valid knowledge and the structure of data as illumined by these principles.[4] These essays are precursors to Wilber's later writings and are important in their own right. They are, in addition, somewhat "fused" in their articulation and accordingly can be used to illustrate a way of preserving what are key elements

still in use in his current writing while negating what are partially correct or erroneous conclusions. In keeping with this, I will translate some of the terminology and ideas found in these essays into a language more consistent with Wilber's recent work.[5] But first, Integral Methodological Pluralism.

Integral Scientific Method

One of the more difficult obstacles to constructing an Integral Science is the notion of "the scientific method." Several critics have pointed out the difficulty in isolating one particular method, though it has not stopped the effort in various circles.[6][7] It is not that the effort is without merit, as there are several good reasons to clarify just what separates "science" from other disciplines (think of the evolution versus creationism debate in the United States or certain postmodern attempts to equate science with literature), but the approach tends toward exclusion rather than inclusion. Probably the most damning difficulty in trying to sort out what may or may not be the scientific method is, in terms of the AQAL matrix, the multiplicity of perspectives available. What appears as "the" method from one perspective looks quite foreign from another, and the result is various claims to authenticity accompanied by sometimes vicious attacks against other approaches. In an effort to correct this difficulty, we look to an Integral Methodological Pluralism.

Now, any methodology is essentially a body of paradigms (acts, methods, or injunctions) with a set of rules or heuristic principles that guide the application and validity limits of those paradigms.[8] Integral Methodological Pluralism is no different in this regard, though it does distinguish between two types of practice: paradigmatic practices and meta-paradigmatic practices.

The paradigmatic portion is an attempt to gain acquaintance with all of the methodologies of inquiry available to us. To that end, we will employ a principle of *nonexclusion*. Nonexclusion

implies that we accept the truth claims of the various forms of inquiry to the extent that they weigh in on the apprehensions they have generated or illuminated. As Wilber puts it:

> Nonexclusion means that we can accept the valid truth claims (i.e., the truth claims that pass the validity tests *for their own paradigms* in their own fields, whether in hermeneutics, spirituality, science, etc.) insofar as they make statements about the existence of their own enacted and disclosed phenomena, but not when they make statements about the existence of phenomena enacted by other paradigms. That is, one paradigm can competently pass judgments within its own worldspace, but not on those spaces enacted (and only seen) by other paradigms.[9]

Thus, the first step in creating an Integral Methodological Pluralism for science that can accommodate multiple methodologies is not so much a critical judgment but a normative one. That is, our first step should include as many inquiry-based methodologies as possible. And while not all of these methodologies will be engaged in *valid* modes of inquiry, we begin in a more gracious position to make evaluations. The more approaches to truth we include in our purview, the better chance our Science has of manifesting an embodiment of truth.

Once a basic awareness has developed of just what is "out there" (or "in here") in terms of methodologies, we can then take the meta-paradigmatic step and explore the ways in which these methodologies might mesh. If the paradigmatic step brings us all under the same roof, the meta-paradigmatic step gives us the house rules, or rather, the guidelines for relations within and between paradigms. For this step two further principles will come into play: *enfoldment* and *enactment*.

Enfoldment implies that along any developmental line, some truth claims are greater (i.e., have more depth) than others, and that a basic pattern of "transcend and include" prevails. The

"transcend" portion covers the novel paradigmatic emergents that arise, ruptures-with-continuity, methodologies and data domains that are somehow more full of depth, more inclusive, more expressive of truth (again, where truth is adjudicated according to those trained in looking with a particular eye, via injunction/s and the apprehensions garnered by the injunction/s). The "include" portion acknowledges the retention and (potential) integration of the prior methodologies and data domains along that developmental line: it is a "reaching back," an embrace of what has come before, which now acts as a constituent element of the newly emerged methodology. This principle gives us an imprimatur to seek the greatest depth for the greatest span: bring together the most methodologies and clarify the best methodologies available. Yet, while depth and span along one or another developmental line is fine, what about between lines? This is where we invoke the principle of enactment.

Enactment reminds us that different methodologies bring forth different data domains. Placing this in our AQAL matrix, Wilber states, "the phenomena brought forth by various types of human inquiry will be different depending on the quadrants, levels, lines, states, and types of the subjects bringing forth the phenomena."[10] Different methods produce different data—plain and simple. What prevents this whole affair from spinning off into so many incommensurable data domains is that any sentient being (say you or I) who is aware of the methodologies, and can adequately complete the injunctions and apprehend the data generated, can weigh in on the relative truth claims between paradigms.[11] The point is not then to cast away the paradigm of lesser depth (or madly dissociate and elevate the paradigm of greater depth), but merely to situate paradigms relative to each other so that all can shine forth in their own inimitable ways and be revelatory of this or that face of the Kosmos.

Enactment has the advantages of retaining and encouraging particular research programs while also constructing a communicative and adjudicative framework between research endeavors.

This amounts to a common language (or at least a robust translation program) to help sort out the strengths and weaknesses of any family of inquiry-based endeavors.

Thus, a depth of research along any given line of inquiry, say molecular genetics, will continue, but those geneticists will better comprehend the situatedness of their methodology relative to several other methodologies (a freeing by limiting) and will be privy to opportunities in which they might explore 1) how their research might contribute to other methodologies, or 2) ways in which they might participate in other methodologies.

With that brief overview, we now turn to some of the earlier building blocks of this methodology, the first two essays of Wilber's *Eye to Eye*.

Eyes of Knowledge

In the first essay, titled "Eye to Eye," Wilber differentiates epistemology (forms of knowing) from ontology (realms of being) and shows various logical and historical relations between the two. He delineates three modes of knowing along with three realms with which these modes are engaged. The modes (or "eyes") of knowing are called 1) the eye of flesh, 2) the eye of reason, and 3) the eye of contemplation. The *eye of flesh* is commensurate with the physical eye and is constituted by sensorimotor knowledge. The *eye of reason* is commensurate with the mental eye or the "mind's eye" and is constituted by hermeneutic-phenomenological knowledge. The *eye of contemplation* is commensurate with the spiritual or intuitive eye, and is constituted by liberational-intuitive knowledge.

The realms of knowing, in turn, are the object-domains to which the eyes of knowing turn their respective glances. Again, very broadly defined, Wilber calls these three realms A) sensibilia/matter, B) intelligibilia/mind, and C) transcendelia/spirit. *Sensibilia* are the gross manifestations of energy-matter in physical space-time, which are detectable with the physical eye (or senses) and its (their) extensions. *Intelligibilia* are the subtle manifestations of thought in

narrative space-time, which are detectable with the mental eye. *Transcendelia* are the very subtle manifestations of spirit in infinity-eternity, which are detectable with the contemplative eye.

So, three eyes and three realms. But note the following: while any eye can be applied to any realm, each eye is most adequate, or natively attuned, to its correlative realm.[12] Thus, the eye of flesh functions best with sensibilia, the eye of reason with intelligibilia, and the eye of contemplation with transcendelia. (See figure 1.)

Eye of Knowing	Realm
Contemplation	Transcendelia/spirit
Reason	Intelligibilia/mind
Flesh	Sensibilia/body

Figure 1. Eyes of Knowing and Their Native Realms

Methodologies and Three Strands of Valid Knowledge

In drawing out the distinctions between eyes of knowing, Wilber notes that each eye is distinguished by a distinct *methodology* (or family of methodologies) that reveals or illumines the elements of a particular object-domain. That revelation or illumination is an *apprehension* and apprehensions are *data*—data that appear (or are generated) in accord with the particular eye that is looking. Sequentially, we have the following: look with one of the eyes (methodology) and see something (data). Or, first an instrumental injunction ("do this," e.g., touch, think, meditate) followed by an immediate apprehension ("have an experience," e.g., softness, clarity, spaciousness).

To further validate the knowledge—to make sure the data are not idiosyncratic or irretrievably subjective—the data and methods are shared with a community of participants who have also completed the injunctive method and have apprehended data generated by the injunction. These three components—*injunction, apprehension, consensual validation*—are what Wilber calls the three strands of all valid knowledge.

The three strands are not specific methodologies, but the core elements of any methodology generating valid data. Note Wilber's caveat: "…the *actual methodologies* of data accumulation and verification differ drastically in all three modes, but…the *abstract principles* of data accumulation are essentially *identical* in each."[13]

Likewise with data: we must be careful not to conflate specific data with general apprehension. This sort of maneuver is classically associated with scientism, whose defining idea is that data generated from the realm of sensibilia (or "empirical data") are the only valid apprehensions. This is a bit narrowing as we have at least two other broad families of apprehension (intelligibilia and transcendelia) whose methodologies are not simply or solely directed toward sensorimotor occasions. Because this was (and still is) such a thorny stumbling block in epistemology, Wilber devotes most of the essay to an examination of data—empirical and otherwise.

Experiential, Empirical Data

In the second chapter, titled "The Problem of Proof," Wilber defines data as "any *directly apprehended experience* (using "experience" in the broad sense, as prehension or awareness)."[14] He retains the traditional construal of empirical as "knowledge obtained by the senses," and then expands the traditional definition of empiricism into a more gracious inclusion as broadly "experiential" (i.e., data). Data, then, is not simply knowledge via the senses, but *any* experiential knowledge. This makes room for separate realms of data commensurate with the eye that is looking. Making use of the demarcations of modes and realms of experience from the

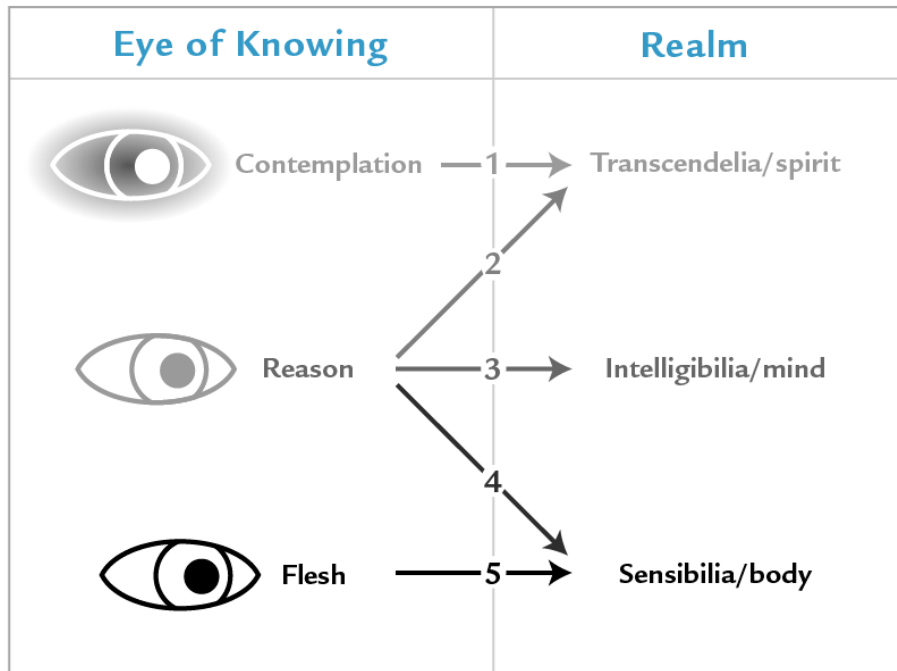prior essay, Wilber points out five different types of empiricism or experientialism[15] (see figure 2).

Figure 2. Epistemological Modes

Describing these expanded epistemological relationships, Wilber writes:

> Mode # 5 is simple sensorimotor cognition, the eye of the flesh, the pre-symbolic grasp of the presymbolic world (sensibilia). Mode # 4 is empiric-analytic thought; it is mind (intelligibilia) reflecting on and grounding itself *in* the world of sensibilia. Mode # 3 is mental-phenomenological thought; it is mind (intelligibilia) reflecting on and grounding itself in the world of intelligibilia itself. Mode # 2 can be called mandalic or paradoxical thinking; it is mind (intelligibilia) attempting to reason about spirit or transcendelia. And mode # 1 is *gnosis*, the eye of contemplation, the transsymbolic grasp of the transsymbolic world, spirit's direct knowledge of spirit, the immediate intuition of transcendelia.[16]

Here are some examples of the engagements between different eyes and realms:

- Kick a rock with your foot
- Analyze the chemical composition of the rock you just kicked
- Explore the meaning of the word "rock"
- Use "rock" to metaphorically convey a dimension of Spirit
- Realize Spirit via the rock koan

Example one is a sensorimotor injunction applied to the domain of sensibilia (sensory foot applied to physical rock; matter looking at matter; methodological paradigm is kinesthetic theory).[17]

Example two is a mental injunction applied to the domain of sensibilia (mental model applied to physical rock; mind looking at matter; methodological paradigm is chemical-geologic theory).

Example three is a mental injunction applied to the realm of intelligibilia (mental symbol of "rock" applied to hermeneutic-linguistic structures; mind looking at mind; methodological paradigm is hermeneutic-linguistic theory).

Example four is a mental injunction applied to the realm of transcendelia (mental metaphor applied to spiritual phenomena; mind looking at Spirit; methodological paradigm is mandalic-paradox theory).

Example five is a contemplative injunction applied to the realm of transcendelia (contemplative eye applied to spiritual phenomena; Spirit looking at Spirit; methodological paradigm is meditative theory).

Those five modes of knowledge set the groundwork for further elaborations of the framework of scientific knowledge. And we need further elaborations because data—in and of themselves—are essentially meaningless. We can gather data until we are blue in the face, but this is generally

known as naïve induction and has little to do with science on the whole. Creating frameworks to make sense of our experiences leads us into the heart of the scientific universe, where hypotheses, laws, and theories arise.

Theories and Laws

If we read a little further on in the second essay, in a section called "Theory and Hypothesis," Wilber elaborates his framework of theories, laws, and hypotheses. Wilber begins with theories and is at pains to explain two very different dimensions of theories. He distinguishes between theory as, on the one hand, directly apprehended data and, on the other hand, when theory is used to map, model, or match other directly apprehended data. In both cases Wilber is confining the use of theory to mental level pronouncements (as opposed to material or spiritual pronouncements).

From here, Wilber speculates on the ability to speak meaningfully of theoretical consistency in the "higher" sciences (knowledge modes 4 and 5 especially). This is an important topic to grasp because it has bearing on whether we can speak of science beyond a certain level of manifestation (where a lack of applicability calls into doubt our use of the term "integral") and one which will require a technical discussion of theories and laws (so my apologies in advance—those not interested might want to move ahead to the section on "Two Senses of Theory").

To address this point, we need to step back and look at an earlier assertion from the first essay, where there is one little hiccough in Wilber's presentation regarding the relationship between theories and laws. This minor miscue does *not* adversely affect his overall presentation in these earlier essays, but it bears examination if we are to reconcile these earlier models with the most recent models and speak meaningfully of trans-mental theory-formation.

In that first essay, Wilber states:

> The scientific proof is empirical and inductive; it is not rational and deductive (although, obviously, science uses logic and deduction, only it makes them subservient to empirical induction). Induction… is the formation of general laws on the basis of numerous specific circumstances (the opposite of deduction). For instance, after Galileo tried his experiment on metallic objects, he might try it on wooden ones, then on clay ones, then paper ones, and so on and see if he got the same results. That is induction: the suggested proposition is tested in all sorts of new circumstances; if it is *not disproved* in those circumstances, it is to that extent confirmed. The proposition itself is generally called a *hypothesis*. A hypothesis not yet disproved (without extenuating circumstances) is generally called a *theory*. And theory that looks like it may in fact never be disproved (supplemented, perhaps, but not fundamentally invalidated in its own realm) is generally called a *law*.[18]

Although Wilber proposes a developmental premise of hypothesis to theory to law in this phase of his writings (the introduction of developmental stages), this sort of development doesn't appear in the scientific literature—or rather, it appears as an unfounded assertion—a myth of sorts—perpetuated in countless textbooks of science without evidentiary support. As Lederman[19] notes:

> [A] simplistic, hierarchical view of the relationship between theories and laws [is often held] whereby theories become laws depending on the availability of supporting evidence. It follows from this notion that scientific laws have a higher status than scientific theories. Both notions, however, are inappropriate because, among other things, theories and laws are different kinds of knowledge and one cannot develop or be transformed into the other. Laws are statements or

descriptions of the relationships among observable phenomena. Boyle's law, which relates the pressure of a gas to its volume at a constant temperature, is a case in point. Theories, by contrast, are inferred explanations for observable phenomena. The kinetic molecular theory, which explains Boyle's law, is one example. Moreover, theories are as legitimate a product of science as laws. Scientists do not usually formulate theories in the hope that one day they will acquire the status of "law." Scientific theories, in their own right, serve important roles, such as guiding investigations and generating new research problems in addition to explaining relatively huge sets of seemingly unrelated observations in more than one field of investigation. For example, the kinetic molecular theory serves to explain phenomena that relate to changes in the physical states of matter, others that relate to the rates of chemical reactions, and still other phenomena that relate to heat and its transfer, to mention just a few.

Newton's Laws are perhaps the most commonly invoked example, which did not show any strict development from anything deemed Newton's theories. Conversely, Newton's Laws will never become Newton's theories—simply because the two types of knowledge are structured differently. Perhaps a simple, preliminary way to explain the distinction is that laws are essentially grounded in exterior patterns and behaviors, whereas theories, to some degree, are engaged in interior patterns of intention, expression, and meaning. *That theories imply an effort to understand or comprehend (whereas laws are tracing observables) is evidence of a difference in perspectives.* Both theories and laws are essentially third-person expressions, but laws catalog relations in third-person terms without necessary recourse to first- and second-person dimensions (a practice of science that has given it a reputation as "impartial," or as some have said, "bloodless"), whereas theories are third-person explanations that call upon first- and second-person dimensions.

If common language is any indicator, you don't often hear of "right" or "wrong" theories, but rather of "good" and "bad" theories, or even "best" and "elegant" theories. Right and wrong are essentially propositional, "true/false" descriptors, whereas good and bad are value-laden, depth descriptors. Laws attempt to describe "what is," theories attempt to expound "what should be." And that difference between "what is" and "what should be" is one way of distinguishing, respectively, our Right-Hand quadrants (propositional and functional fit truth claims) and our Left-Hand quadrants (aesthetic and intersubjective truth claims).

That said, theories are not simply moral statements or aesthetic judgments, but they are engaged to a significant degree in abduction—or creativity—to elucidate "what should be" in order for apprehensions (data) and relations of apprehensions (laws) to cohere.[20] This type of "should be" is more along the lines of imagining what must be present in order for our models to be coherent, imagining how all of the pieces fit together, though the emphasis is traditionally on the exterior components (again, a concern with propositional truth and functional fit). Hence, we have several predictive efforts in the sciences that postulate the existence of various components—of "what should be" present—in order for the map to cohere elements that quite often are "found" in subsequent experiments. As one ongoing example of this, several models of the physical universe predicted the existence of sub-atomic particles that had never been observed but which were presumed to exist…particles that were subsequently discovered.

And this is a generative cycle, insofar as it leads to further research/hypothesizing (note here Wilber's definition of a hypothesis as a "tentative map plus suggested injunctions") and attempts to look for "what is" (apprehensions), finding relations of "what is" (laws), and explaining "what should be" (theories). In terms of a method (or a methodological sequencing), it is not nearly as simple as steps one, two, three: hypothesis-formation, theory-formation, law-formation. Again, these elements are not aligned in a linear, hierarchical relationship with each neatly flowing out

of its sequential predecessor, but these three elements are key structural components of an Integral scientific methodology.

Two Senses of Theory

With that technical overview out of the way, let us jump ahead now to Wilber's most recent writings, where he uses theory as before, as a mental cartography, or as a superstructure of worldviews resting upon a techno-economic production base (in this case, the productions of science: experiments, research, injunctions, and their data), and there is no reason to abandon that usage. But I think we can speak of theory more broadly as pan-interior, or broadly interpretive, and law as factual (or approximately factual in the sense of "Kosmic habits" that Wilber—following Peirce—uses in his latest writings[21]) with certain proscriptive understandings in place.[22]

A primary benefit in doing this is to redress an imbalance in the understanding of theory-formation as not simply a mapping exercise or an intermediate step on the way to law-formation, but as a meaning exercise, inherently involving interior dimensions, or knowledge by acquaintance rather than by description. As Wilber writes in his excerpts, there is an interpretation that is mental-level specific on the one hand and interpretation that is pan-interior on the other hand.[23] Theory as a specific mental-level occasion is a version of that narrow form of interpretation, whereas theory as understanding, as felt comprehension, is akin to the broader sense of interpretation.

So, when Phase-2 Wilber addresses the possibility of a theory of Gnostic knowledge (Spirit looking at Spirit), he answers in the negative—that this type of knowledge is essentially "transtheoretical."[24] This is correct when theory is construed as a mental map, a construction of reasoning, or a verbal, symbolic representation. But if we demand that our science has theoretical consistency, then this consistency must mean something more generous than is usually intended

if we are to include the higher, trans-mental levels. And there is historical precedent for the use of theory in this way (see endnote 18 for a quick taste of this), as well as some contemporary researchers that make use of theory in a pan-interior sense (e.g., Robert Kegan and Howard Gardner), but we will defer that discussion for another time. For now, let us just note that theory-formation can plausibly be present at any level of relational exchange, and so long as we have a plurality of sentient manifestation at any level (as the AQAL model implies—there is a plural dimension to any manifest occasion) we can have a theoretically consistent science at any level.

Phase Shifts

Earlier, I noted that these essays are an earlier phase of Wilber's writings, called Phase-2.[25] As such, many of his later differentiations are still fused in these writings, and now is a good time to look at those differentiations. Phase-2—a move away from the retro-Romantic aspects of the writings of Phase-1—was distinguished by its introduction of developmental waves, levels, or stages (in the present case, our three-five levels of knowledge). The transition from Phase-2 to Phase-3 was marked by an inclusion of developmental lines. The transition to Phase-4 was the introduction of the four quadrants: dimension-perspectives of individual, collective, interior, and exterior. And Phase-5 is marked by the introduction of post-metaphysical theorizing using the AQAL model.

As might be expected, the relatively undifferentiated developmental view that created a phase-appropriate, but relatively distorted, relationship of law and theory is precisely the sort of construction that Wilber corrects in later versions of his writings. Laws and theories evolve (thus preserving the developmental premise), but they evolve relatively independently of one another (thus negating the incorrect developmental hierarchy). In the shift to Phase-3, we see that the three eyes of knowing are teased apart somewhat, where the "three" earmarks different levels, and the "eyes" denote both self and cognitive lines of development. Here is an example from one of the Phase-4 writings that describes various self lines:

> [T]*he ego* [eye of flesh] *orients consciousness to the gross…the soul* [eye of reason] *orients consciousness to the subtle,* [*and*] *the Self* [eye of contemplation] *orients consciousness to the causal.* While all of them have their root dispositions in specific realms [respectively, body, mind, spirit], they also have their own lines or streams of development, so they often overlap each other…. [*E*]*go and soul and Spirit can in many ways coexist and develop together*, because they are relatively separate streams flowing through the waves [or, lines moving through stages].[26]

Wilber further refines this when he refers to multiple cognitive lines of development, which are termed gross/gross-reflecting, subtle, and causal/nondual. These are roughly equivalent with the eyes of flesh, reason, and contemplation, respectively.[27]

In Phase-4, Wilber introduces the quadrants, which rework the nature of the epistemological-ontological relationship. The quadrants, remember, are the four basic perspectives inherent in and available to any sentient being: interior, exterior, individual, and collective. Wilber's theory regarding the quadrants has two major facets: one, that the quadrants are coeval, or that they "tetra-evolve"; and two, that the quadrants are irreducible to one another. As far as our data and methodologies go, the four quadrants are a new playing field, within which we find that there are not simply physical, mental, and spiritual domains in a hierarchical relationship, but that the physical, mental, and spiritual are coeval. In other words, the physical is approximately the Right-Hand quadrants (the exteriors), and the mental and spiritual are related but distinct structures in the Left-Hand quadrants.[28]

In Wilber's most recent writings, data, and the laws that describe them, are comprised of relational perspectives. Perspectives, recall, are commensurate with the quadrants in the AQAL matrix: first-person, second-person, and third-person perspectives correspond to the UL, LL, and UR/LR quadrants, respectively. And methodologies are the means of enacting these perspectives.

We can express related data in mathematical notation (Boyle's law: $p_1V_1=p_2V_2$) or narrative form (Boyle's Law: under conditions of constant temperature and quantity, there is an inverse relationship between the volume and pressure for an ideal gas). In addition to his usual narrative flair, Wilber has outlined what he calls an "Integral calculus of primordial perspectives," which employs a more rigorous, quasi-mathematical notation of perspectives to describe these relations.[29]

This mathematics of perspectives draws upon a reconstructive investigation of phenomena in all four quadrants and an elucidation of "Kosmic habits" as they occur. These habits are effectively "probability spaces" within which certain relations tend to play out, and these habits are present in individuals, cultures, behaviors, material-energetic patterns, socio-economic structures (i.e., across all four quadrants). As Wilber puts it:

> Some probability waves are so tightly laid down as Kosmic habits that the probability of finding a particular type of holon [a holon is a whole/part, or that which is simultaneously a whole and a part of another whole] in that space approaches 100%. This often happens in physical systems (where, as Whitehead pointed out, it was mistaken as pure determinism); but it happens often enough even at higher waves (e.g., the probability of finding certain types of holons at the [egocentric value] probability wave is very high indeed). But that should not obscure the fact that the stages/waves of development, in all quadrants up to the present, originally emerged in part as creative novelty and were then laid down as habits that accordingly represent, not rigid grids of determinism, but organic habits indicating the likelihood or probability of finding a particular event in a particular spacetime.[30]

To bring the terminology up to date with our existing design matrix, the eyes of knowing in this Phase-5 formulation become a concert of perspectives (quadrants), with both historical roots

(laws, Kosmic habits) and creative novelty (theoretical interpretation, apprehension), manifesting various degrees of depth (levels) along multiple modes of intelligence (lines), each of which gives a slightly different look at each of the object-domains. Though we won't be touching on it here, these perspectives occur in various states and with several typologies, rounding out our AQAL tour.

Conclusion

While there is much more to say on the topic, I will not elaborate any further on the Phase-5 writings as they are still in a formative phase, and as such are intimations of things to come more than definitive statements. But I think we have the flavor of the developmental changes at play: Wilber has achieved a much finer granularity in the later writings than is present in the early essays of *Eye to Eye*. He has embraced a multi-perspectival approach (nonexclusion), differentiated and integrated facets of his earlier work (enfoldment), and made efforts to coordinate the gathering of perspectives within his AQAL matrix (enactment). That endeavor, in a nutshell, is Integral Methodological Pluralism, and it stands as a solid exemplar of what an Integral Science is all about.

One last comment—I hope the reader understands that these principles and models are all part of a game—a very serious game, but a game nonetheless. All of what you have just read is meant to be fun, to be played with, and enjoyed; not something to be burdened by. Integral Science, the AQAL model, and Integral Methodological Pluralism…these things are not meant as overlays to suffocate the lives you lead. No one should be trying to fit into conceptual straightjackets, least of all with models that purport to cover all the dimensions of reality—no model could ever do such a thing. It's just that as life pushes us on, it's fun to push life back a little and see what the pushing yields, to see what contours and forces are at play, and to share those experiences with each other. And integral models—those that explicitly identify, encourage, and preserve the many fields of play available—seem a pretty good way to go about that. If I could sum up

Integral Science neatly, it would be something like: play and wonder, as both verbs and nouns. So I exhort you to play and wonder, and let the rest unfold as it will.

Endnotes

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[1] Consult Koller, "Architecture of an integral science," 2006. This paper presupposes familiarity with certain terminology associated with AQAL theory, and for those new to AQAL lingo, I encourage a perusal of this other paper first.

[2] I will not elaborate on specific data collections or traditional methodologies in this paper. This effort will occur at the Integral Science Center at www.integralinstitute.org. Several taxonomies with representative sciences and their methodologies will be presented at that site.

[3] See Wilber, "Introduction to excerpts, from volume 2 of the Kosmos trilogy," 2003a.

[4] Wilber, *The collected works of Ken Wilber* (Vol. 3), 1999, pp. 153-226. These two essays are posted in their entirety at www.integralinstitute.org.

[5] These two essays were written in what is called Wilber's Phase-2 writings, whereas his current work is Phase-5; more on that later.

[6] For a constellation of related problems concerning the scientific method, consult McComas, "The principal elements of the nature of science: Dispelling the myths," 2004.

[7] This is, in many respects, the arena of the philosophy of science, which includes such notables as Whitehead, Peirce, Carnap, Popper, Kuhn, Lakatos, Toulmin, and Feyerabend, to name just a very, very few. The body of literature on the scientific method and science as a purveyor of truth is just immense, and I am aiming for a very preliminary look at this topic via Wilber's writings.

[8] I make a distinction here between method and methodology that is not always made in the literature. I am viewing method as essentially procedural (e.g., "these are the steps to follow when taking cell sections…") and methodology as encompassing of procedure and guiding interests or assumptions ("these are the steps to follow in taking cell sections and this is why we take cell sections and what we think this activity reveals…"). As I am using the terms, it is more appropriate when reading the main body of the text to think of "the scientific method" as a subset of "the scientific methodology."

[9] Wilber, "Excerpt B: The many ways we touch; Three principles helpful for any integrative approach," 2003c

[10] Wilber, "Excerpt B: The many ways we touch; Three principles helpful for any integrative approach," 2003c

[11] Following Wilber's use of paradigms as injunctions or bases of production.

[12] Because each eye is "built" on the same structural foundation as its native realm, the eyes possess a native understanding or communion with their respective object-domains. They are of a piece, they "get" each other more readily, and they have the same basic hands with which handshaking can occur.

For example, biochemical or sensorimotor knowledge (e.g., the immune system cell actions) interacts with other biochemical structures (e.g., viral protein) more readily than it does atomic structures (e.g., ultraviolet rays) or mental structures (e.g., symbols). Because of the structural similarities, the object-domains can be more readily cognized and apprehension is less effortful because knowing structure and known structure are more closely aligned.

[13] Wilber, *The collected works of Ken Wilber* (Vol. 3), 1999, p. 192

[14] Wilber, *The collected works of Ken Wilber* (Vol. 3), 1999, p. 187

[15] There can also be examples of contemplation looking at mind, contemplation looking at body, and likewise flesh looking at both mind and Spirit. Wilber covers these modes briefly when articulating several historical "category errors." A category error is the attempt of one or another eye of knowing to interpret other realms of data in terms of its native realm, or, as Wilber puts it, "one eye [attempts] to usurp the roles of the other two." See Wilber, *The collected works of Ken Wilber* (Vol. 3), 1999, p. 158.

Among other unhappy occasions, category error has contributed to aspects of Scientism, religious inquisitions, and rational "proofs" of God's existence. It's not that there are no valid inquiries to be made or knowledge to acquire when crossing over, just that the introduction of a "mapping" procedure occurs with crossover, and the map is not the territory.

[16] Wilber, *The collected works of Ken Wilber* (Vol. 3), 1999, pp. 213-214

[17] In these examples, I follow Wilber's use of paradigm as an injunction, but I am making use of "theory" in a very specific way that is not used by Wilber in any of his writings. So, we are not at this point tracing his thoughts. The reason I am pursuing this line of thought is to demonstrate a way in which we might legitimately tie the activity of theory to any level of science. This is a pretty complicated topic, and I don't want to push too far away from the main currents of the present essay. However, I want to throw out a few thoughts on the matter and reserve the rest of the discussion for another paper.

In its contemporary scientific sense, theory is an explanation of observed phenomenon used in various knowledge-domain couplings. Traditionally, theory is defined as a mental level explanation of the observations and inferences surrounding a given data set, and as such, are not usually associated with type 1 or type 5 epistemological relationships which are pre- and post-mental (see figure 2). "Mental" can mean many things, of course, and in the context of these early essays, Wilber is using it as a basic level of consciousness, located on a graded hierarchy between bodily consciousness and spiritual consciousness.

Now, in terms of the three strands of valid knowledge, theory can be both an injunction and an apprehension. In Wilber's presentation, he focuses on the apprehension aspect, terming theory an immediate mental apprehension used to mediately map other apprehensions.

Theory is also an injunction in that one might "theorize," or use a theory to generate apprehensions. Indeed, "theory" derives from the Greek word *theoria*, meaning "contemplation, a looking at." This usage goes back at least to Plato and Aristotle, whose implication here—as with the other major forms of knowledge, praxis, and poiesis—was that it was an activity, a doing. As Andrea Nightingale explores in her work, *Spectacles of truth in classical greek philosophy: Theoria in its cultural context*, *theoria* was the name of a practice undertaken by individuals (called *theoros*, "theorists") consisting of a pilgrimage to religious or oracular sites to bear witness to sacred truths. From her introduction:

> Plato, who was the first to conceptualize philosophic "theorizing," made full use of the model of traditional *theoria*, with its journey abroad, viewing of a spectacle, and subsequent return home. In the *Republic* 5–7, the most detailed account of *theoria* in the Platonic corpus, Plato models philosophic *theoria* on the traditional practice of civic *theoria*. In this kind of *theoria*, the *theoros* journeys forth as an official witness to a spectacle, and then returns as a messenger or reporter: at the end of the journey, he gives a verbal account of a visual, spectacular event. The journey as a whole, including the final report, is located in a civic context. In Plato's account of philosophic *theoria* in the *Republic*, theoretical activity is not confined to the rational contemplation of the Forms; rather, it encompasses the entire journey, from departure to contemplation to reentry and reportage. The intellectual "seeing" at the center of the journey, which I call "contemplation," is thus nested in a larger context which is both social and political. As Plato claims, the philosophic theorist will, when he returns, "give an account" of his vision which is open to inspection and to questioning. In addition, he will translate his contemplative wisdom into practical and (under certain conditions) political activities: his theoretical wisdom provides the basis for action. In the good city, moreover, the theoretical philosophers will rule the polis: here, Plato places the philosophic theorist at the very center of political life.
>
> According to Plato, the philosopher is altered and transformed by the journey of *theoria* and the activity of contemplation. He thus "returns" as a sort of stranger to his own kind, bringing a radical alterity into the city. When the philosopher goes back to the social realm, he remains detached from worldly goods and values even when he is acting in the world. Even in the ideal city, the philosopher is marked by detachment and alterity, he possesses a divine perspective that is foreign to the ordinary man. This peculiar combination of detachment and engagement allows the Platonic theorist to perform on the social stage in a fashion that is impartial, just, and virtuous.

So the first point is theory can be associated with either of our first two strands of valid knowledge, and therefore is not confined strictly to either strand.

A second point is that theories as explanatory frameworks are of at least two types: those that explain "how" and those that explain "why." Within the AQAL matrix, theories of the first type are generally concerned with third-person dimensions and the Right-Hand quadrants. These theories are trying to adjudicate propositional truth and functional fit (i.e., the way things cohere, or fit together), and they have close ties with scientific laws, which are essentially expressions of patterns of relations. Theories of the latter type ("why") are concerned with first- and second-person dimensions and the Left-Hand quadrants. These theories attempt to adjudicate truthfulness and justness, or intentional and normative dimensions: the way things feel together. There are also affinities here with what are termed in the philosophy of science the contexts of discovery and justification, where discovery is something like a first-person, creative activity and justification a third-person, experimental-empirical method.

One of the interesting facets of this saga is the split between an historical/psychological/sociological approach (discovery) and a philosophical/epistemological approach (justification), where the philosophical camp was trying to distinguish and divorce itself from the other camp. This was a philosophical approach approaching positivism, or, empiricism in the narrow sense. All of which is strangely related to Aristotle's separation of theoria

as an essentially static (meaning permanent, ever-present) form of knowledge from praxis and poiesis, which are dynamic (and inferior) forms. Further analogies can be drawn from the pure vs. applied science debates, and the general mind-body dualism, but more on all of this at another time.

While not wishing to do away with the more narrow usage of theory as a mental mapping process, my usage simply expands theory (especially in its normative and intentional expressions) to mean a generally interpretive act, a move toward understanding or comprehension. This is roughly equivalent to Wilber's broad definition of interpretation as a being's prehension or feeling of the immediately preceding moment, a feeling which is not found anywhere in the makeup of that preceding moment. Explanation and understanding are not necessarily mental symbolic occasions, as Wilber often demonstrates when his explanations take the form of suggested injunction (he commonly explains the major facet of the mind-body dualism as resolvable only via satori, or awakening by whatever name). On the other end of the knowledge spectrum, we see something similar as well. For example, there is some form of understanding possessed by human cells to replicate and repair themselves, and this is apparent to the methods of biology, which (as a mental discipline) present formal-operational theories to account for such understandings. But these understandings, while well understood and executed quite nicely by the cells themselves are gradually less comprehensible and otherwise quite unconscious to higher cognitive/mental manifestations: my formal-cognitive skills may guess at the nature of cellular relations and map them out (theory in the narrow sense), they might even operate on those processes based upon these maps (and this "operating on" being a hallmark of a superior level along the mental line), but those cellular relations (theory in the broad sense) take place quite subconsciously.

Insofar as theory is a "looking at," it need not be confined to the mental level but can legitimately be expanded to any of the three eyes of knowledge, with the provision that theories in the narrow sense do not cover all five types of epistemological relationships, but only numbers 2-4. We just need to be cautious regarding usage. In this way, I think we can speak of theories of pre- and post-mental varieties, and we can have theories of sensorimotor and spirit alike. One caveat: because theory in the post-modern usage has meant something like "thought without practice," we want to be careful to qualify that usage lest we find ourselves dangling by a mental theory without sound injunction.

But please note: there are higher knowledges (those beyond formal-operational, rational cognition) and then there is "highest" knowledge (Emptiness, prajna, gnosis). And highest knowledge is not knowledge per se…it is simply not characterizable. Insofar as knowledge implies knowledge "of" something or other, highest knowledge perceives neither a perceiving subject nor a perceived object. Deeming it knowledge is something of a misnomer in this regard and is just a placeholder for the methodology that increases the probability of that "happening." Because of this, I don't believe theory in either sense gets at it, except as a suggestive tool. But up until then, it is just fine.

I don't want to push this argument any further at the moment. The intention here is not to get bent out of shape over particular words but to provide a way of talking about theory as it manifests along a spectrum of knowing so that it doesn't too badly deform historical or contemporary usage, while at the same time capturing several nuances. So, *if* there is a desire to speak of higher, trans-mental sciences, and *if* we find it imperative that these sciences have a theoretical component, then I believe we have to take something like the approach suggested above. The final point is that whatever words we choose, an injunction and an apprehension (and a communal verification) are requisite for the validation of these knowledge claims, and the words we choose should be explicit about that.

[18] Wilber, *The collected works of Ken Wilber* (Vol. 3), 1999, p. 165. Note that some debate exists regarding the validity of speaking of scientific laws in realms other than the sensorimotor. I think there is every reason to speak of scientific laws occurring at every level of manifest existence, simply because there is relational exchange at every level and the defining patterns of relational exchange are effectively laws. I do not find it particularly helpful to confine scientific laws to sensorimotor realms, though I understand the appeal of confining scientific laws to that level simply because that which manifests on that level is less likely to evolve and, therefore, the laws are less likely to change—the advantage of a law being its relative stability in expressing relations. See Stephen Toulmin's body of work for a very cogent analysis of the genesis of this predilection for fixed and stable laws, especially *Cosmopolis: The hidden agenda of modernity*, 1990.

[19] Lederman, "The state of science education: Subject matter without context," 1998. See also Horner & Rubba, "The laws-are-mature-theories fable," 1979, p. 31. Wilber's use of "theory" is accurate but only in a limited sense—one that arises out of the colloquial usage of the word "theory" meaning "immature law" by some scientists and science textbook editors. If Wilber was surveying the major uses of the word "theory"—a technique he often

performs elsewhere when examining nuances of meaning—his usage would be quite valid in the context of how some scientists understand their endeavors, but he does not pursue those nuances in that essay and hence misses the consensus understanding of "theory" (as described by Lederman). Since Wilber's essay was ostensibly exploring the philosophy of science, his sequence does not fully represent the notions (and relations) of law and theory according to science philosophers, science historians, and science educators—as well as many scientists. The endgame of science is not law-formation, as Wilber's sequence implies, nor do theories morph into laws like acorns morph into oaks. For purposes of the philosophy of science, then, I recommend Sonleitner's approach (consult McComas, "The principal elements of the nature of science: Dispelling the myths," 2004), which differentiates three trails of hypotheses: one which leads to theories, one to laws, and a third to predictions. And Wilber's own Phase-5 theorizing is more adequate to this task, but more on that in the main body of the essay.

[20] Following Peirce's distinction of abduction—an inference to the best explanation—from induction and deduction.

[21] Wilber, "Excerpt A: An integral age at the leading edge," 2003b

[22] Consult endnote 18.

[23] Wilber, "Excerpt A: An integral age at the leading edge," 2003b

[24] Wilber, *The collected works of Ken Wilber* (Vol. 3), 1999, p. 217

[25] Consult Wilber, "Introduction to the third volume of *The collected works of Ken Wilber*," n.d., or Wilber, *The collected works of Ken Wilber* (Vol. 3), 1999, pp. 1-20, for an overview of these phases as given by Wilber.

[26] Wilber, *One taste: The journals of Ken Wilber*, 1999, p. 296

[27] Wilber, *The collected works of Ken Wilber* (Vol. 4), 1999, pp. 555-559, 632

[28] Physical, mental, and spiritual can still be construed as different levels or different/simultaneous perspective-dimensions. Wilber elaborates on some of these nuances in *Integral psychology: Consciousness, spirit, psychology, therapy* and *The eye of spirit: An integral vision for a world gone slightly mad*.

[29] Wilber, "Excerpt C: The ways we are in this together; Intersubjectivity and interobjectivity in the holonic Kosmos," 2003d. See also Wilber, "Appendix B: An integral mathematics of primordial perspectives," 2004.

[30] Wilber, "Excerpt A: An integral age at the leading edge," 2003b

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KURT KOLLER lives with his wife and three children in Bothell, Washington and works at Pacific Science Center in Seattle, Washington.