

What Connects the Map to the Territory?

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Running Title: How to Bridge the Gap that Bateson Left Between Map and Territory.

Abstract:

Bateson left an unresolved ambiguity in his explanation of the relationship of the mind to the world, the map to the territory. This ambiguity is related to his failure to develop a theory of intentionality, reference, "aboutness." However, he left us all the tools necessary to resolve this ambiguity and to lay the groundwork for a theory of intentionality. In using these tools, a different emphasis is placed on the relationship between change and difference. A proposal is made for an understanding of the rudiments of abstraction. Finally, the ambiguity is addressed and the groundwork of a theory of intentionality proposed, through an understanding of the distinction between (a) the indirect access of creatural mental process to the pleromic world and (b) the direct access of our pleromic hands to the pleromic world. It is through the interplay and alternation of indirect perception/cognition of the world and direct action on the world in manually-operated experiments that Bateson's problem of "maps, of maps, of maps, ad infinitum" is solved and a theory of mediate realism can be derived from his work, linking to an understanding of the roots of intentionality.

BATESON'S LARGE SYNTHESIS

During his long career as a scientist, Gregory Bateson worked on problems in anthropology, psychology, evolutionary biology, and communication theory. A number of his insights were taken up and developed further in the individual disciplines. But the large, trans-disciplinary synthesis that, in his own mind, was his major contribution to science received little attention from the mainstream scientific communities.

In our judgment, one reason that these innovative ideas and their synthesis were not carried forward was due to a deep ambiguity in their formulation, and perhaps to an ambiguity in Gregory's own mind about them.

The Core Ideas might be briefly stated as these:

- The Map is not the territory. Information is not energy. Creatura is not Pleroma.
- It is pattern that connects elements in the biological and mental world.
- The minimal unit of mental process is a negative feedback loop.
- There is a hierarchy of logical types in the phenomenal world.
- Evolution is a form of mind and mind is a form of evolution.

This paper will focus on an ambiguity in the first of these core ideas, an ambiguity that may have ultimately affected the others. Gregory spent a great deal of time clarifying the difference between the world of energy and the world of information. Later, he tried to

point out the “pattern which connects” elements within the world of information. In this paper we will focus on the question of what *connects* the map and territory, the world of information and the world of matter/energy. This connection has to be the first and most vital connection for an epistemologist, and Gregory considered himself an epistemologist. So we will start there.

WHAT GOES FROM TERRITORY TO MAP?

Descartes in the 17th century had proposed a way to distinguish mind and matter that set the tone for studies of mind and nature ever since. Descartes distinguished thought, feeling, emotions, sensation, awareness from all those aspects of the universe that operate mechanistically. This second category, mechanistic matter, included the stars, galaxies, rocks and all machines. In addition, for him, it included the birds, flowers trees, all animals, indeed, every living thing, except for humans. Even the human being was to be understood as a mechanical system, with the sole exception of his/her immaterial mind, which Descartes assumed produced all the thought, feeling emotions, sensation, awareness in the universe. Thus the boundary between mental process and the merely material universe was drawn *inside* the human brain, at the boundary of the pineal gland. Everything outside the immaterial mind attached to the pineal gland of a human being was pure mechanism. This way of distinguishing mind and matter has lasted up to our time.

Gregory proposed to us that the Cartesian line was ineptly drawn. There is, indeed, a line between the world of ideas, of thought, of information, of sensation and the world which operates simply by mechanical pushes and pulls. But that line is to be drawn between the world of “sticks, stones and galaxies” and the world of organisms, ecosystems and the biosphere. Once there is a one-celled organism that can sense its environment and react in ways that lead to the survival of its own integrity, there is mind, there is mental process.

However, in a similar vein to Descartes', Gregory was concerned to show that the world of living things *is* radically different from the world where all changes occur due to energy, forces, impacts, i.e., to pushes and pulls. To help frame the mind/matter distinction in this new way, he borrowed a pair of terms from C.G. Jung and the Gnostics: “Pleroma” and “Creatura.” The world of Pleroma is the world as studied by physics and chemistry, a world which operates by forces, impacts, attractions and repulsions. The world of Creatura, is the world of living systems, *insofar as* their operations require news of difference and circular patterns of information flow.

He made very sure that we grasped that information is not a force, an impact, a push or a pull – that it is something of another order altogether. Something else entirely is going on, he insisted, with information processes than with energy events, although information can never float free from the world of energy, impacts, forces, etc. .

AN UNRESOLVED AMBIGUITY

In the presentation that he gave as the Korzybski Memorial Lecture in 1970, Gregory first made explicit how various pieces of his life's work and thought fit into a truly large synthesis. He remarked that it was at that point that he realized why he had felt impelled to move from discipline to discipline during his career, that this synthesis had been the larger theoretic understanding that he had been seeking.

In this presentation he said:

Now let me leave evolution for a moment to consider what is the unit of mind. Let us go back to the map and territory and ask: "What is it in the territory that gets onto the map."

We know the territory does not get onto the map. That is the central point about which we here are all agreed. Now, if the territory were uniform, nothing would get onto the map except its boundaries, which are the points at which it ceases to be uniform against some larger matrix. What gets onto the map, in fact, is *difference*, be it a difference in altitude, a difference in vegetation, a difference in population structure, a difference in surface, or whatever. Differences are the things that get onto the map.

But what is a difference? A difference is a very peculiar and obscure concept. It is certainly not a thing or an event. This piece of paper is different from the wood of this lectern. There are many differences between them – of color, texture, shape, etc. But if we start to ask about the localization of these differences we get into trouble. Obviously the difference between the paper and the wood is not in the paper; it is obviously not in the wood; it is obviously not in the space between them, and it is obviously not in the time between them. (Difference which occurs across time is what we call "change.")

A difference, then, is an abstract matter. [*Steps*, 457-548]

The ambiguity that Gregory presents here is extreme. Parsed out logically, his claim is self-contradictory. The logic goes like this: What gets from territory to map are differences. Differences are abstractions, i.e., do not exist in space and time. But whatever exists in the territory exists in space and time. Therefore there are no differences in the territory that can get onto the map.

Although Gregory does not explicitly admit this paradox, his later comments show that its logic is working on him.

But what is the territory? Operationally, somebody went out with a retina or a measuring stick and made representations which were then put upon paper. What is on the paper map is a representation of what was in the retinal representation of the man who made the map; and as you push the question back, what you find is an infinite regress, an infinite series of maps. The territory never gets in at all. [*Steps*, 460]

In this paragraph there is a second confusion, between the territory itself and the differences in the territory. Obviously the territory does not get onto the map. I have a “map” of my coffee cup in my brain, but if the cup were in my brain I would die. Gregory has claimed that although the territory does not come across, the *differences* in the territory come across to the map. Yet in this passage he does not speak of the territory at all, nor of its inherent differences, nor even of differences of light on a flesh-and-blood retina, but only of differences in a retinal *representation*. He is as much as

saying that differences start in the retinal representation. They do not come from the world.

The territory is *Ding an sich* and you can't do anything with it. Always the process of representation will filter it out so that the mental world is only maps of maps of maps, *ad infinitum*. [Steps, 460]

If he believed what he originally said, he would have noted that beyond the first map there are real differences in the real territory which “get onto the map.” But once having claimed that *difference* “is an abstract matter,” he cannot. Having thus brought himself to a dead end, he backs up and takes another tack.

Kant, in the *Critique of Judgment*, --if I understand him correctly— asserts that the most elementary aesthetic act is the selection of a fact. He argues that in a piece of chalk there are an infinite number of potential facts. The *Ding an sich*, the piece of chalk, can never enter into communication or mental process because of this infinitude. The sensory receptors cannot accept it; they filter it out. What they do is to select certain *facts* out of the piece of chalk, which then become, in modern terminology, information.

I suggest that Kant's statement can be modified to say that there is an infinite number of differences around and within the piece of chalk. There are differences between the chalk and the rest of the universe, between the chalk and the sun or the moon. And within the piece of chalk, there is for every molecule an infinite number of differences between its location and the locations in which it might have been. Of this infinitude, we select a very limited number, which become information. [Steps, 459]

This time he explicitly accepts a Kantian frame of reference, wherein it is assumed that form and difference derive from the knower, are contributed by the mind to the perceived object, are not fully part of the territory before it is *known*. Kant's notion here of "potential facts" will turn up nine years later, in a footnote in Gregory's book, *Mind and Nature*, as "latent differences."

Once within the Kantian frame, where all formal aspects of nature are observer-dependent, he can talk freely about differences in the territory. But this time the problem is that there are an infinite number of them. So what gets from the territory to the map is now a highly selected sample of the differences in the territory.

How this selection is accomplished is explained later in *Mind and Nature*.

The eyeball has a continual tremor, called *micronystagmus*. The eyeball vibrates through a few seconds of arc and thereby causes the optical image on the retina to move relative to the rods and cones which are the sensitive end organs. The end organs are thus in continual receipt of events that correspond to *outlines* in the visible world. We *draw* distinctions; that is, we pull them out. Those distinctions that remain undrawn are *not*. They are lost forever with the sound of the falling tree which Bishop Berkeley did not hear.* They are part of William Blake's "corporeal": "Nobody knows of its Dwelling Place: it is in Fallacy, and its Existence an Imposture."

* [footnote] The bishop argued that only the perceived is “real” and that the tree which falls *unheard* makes no sound. I would argue that latent differences, i.e., those which for whatever reason do not make a difference, are not *information*, and that “parts,” “wholes,” “trees,” and “sounds” exist as such only in quotation marks. It is *we* who differentiate “tree” from “air” and “earth,” “whole” from “part,” and so on. But do not forget that the “tree” is alive and therefore itself capable of receiving certain sorts of information. It too may discriminate “wet” from “dry.” [MN, 97]

We only pick up differences when we actively “draw a distinction.” Whatever “latent differences” are not actively taken up by the senses do not make a difference. Therefore they “are not.”

This not only says that differences must make a difference to be part of *Creatura*, but it indicates that the link between *Pleroma* and *Creatura* is dubious. If a difference does not make a difference (to someone or something?) it is *not*. With one hand he says there are latent differences in the territory, and with the other he says they “*are not*.”

So, how can we know that the territory, the *Pleroma*, exists at all in the way we distinguish it? Gregory never resolved this conundrum, it seems, with the result that, although he never slipped off into subjective idealism himself, those who survived him in the American Society for Cybernetics, e.g., H. Maturana, F. Varela, H. von Foerster, E. von Glasersfeld, did.

Gregory ended by clinging to epistemological realism as an act of faith, neither abandoning it nor finding a way to support it intellectually. Those who survived him played Fichte to his Kant.

The more he tried to make the distinction between energy and information clear, the more impossible it became to explain how Creatural beings could know the Pleroma,

HOW TO RESOLVE THE AMBIGUITY

Although Bateson never succeeded in showing what connects the Pleroma to the Creatura, he gave us virtually all the necessary tools for doing so ourselves.

For him, differences exist only in creatural maps of the world. Latent difference, differences that do not make it to maps “*are not.*” So let us investigate for ourselves what actually comes across from the territory to the map.

I first heard Gregory speak on Long Island in 1974, at the Lindisfarne Association. Gregory was saying, then, that it is *difference* that gets from the territory to the map. And that difference is perceived through movement of the world relative to the sense organ, or vice versa. He showed what he meant by taking a piece of chalk and grinding the end of it onto a spot on the blackboard, thus leaving a little mound of chalk on the board. He said that if he brought his finger directly down on the little mound, he could

not feel the chalk at all. But if he passed his finger along the blackboard from left to right and passed over the little mound of chalk he could feel it very distinctly. I came up to him after the talk and asked him if it is not rather “change” that comes across. He responded, “Change is difference, plus a clock.”

Many years later I concluded that the right way to say that point is: “Change is difference, minus abstraction.” So, let’s do a thought experiment on what gets from the territory to the map. It can’t be *difference* because, as Gregory pointed out, difference does not exist in space and time and the Pleromic territory is entirely in space and time.

Gregory showed us that what comes across from the territory to the *senses* is *change*, a change in the way the sense organ and the territory are disposed to one another.

Gregory had been impressed with Warren McCulloch’s experiment published as, “What the Frog’s Eye Tells the Frog’s Brain.”(Lettvin, McCulloch, et al., 1959) The frog’s retina only sends signals to its brain if the image on the retina moves. If an insect sitting in front of a frog begins to fly or leap, the frog will begin to see the bug, and maybe catch it. Otherwise the frog will see nothing.

The earlier quote regarding microneurostomus is important here, since it shows that our eyes, like the frog’s, require motion in order to see anything – but that our eyes have their own slight constant tremor that allows us to see stationary objects in front of us.

So, it is change in the environment that is what the sense organism is sensitive to.

Now, changes are essentially temporal and spatial. They occur in some place during some period of time. Changes, then, are not “differences, plus a clock.” Difference is change, plus abstraction. Difference is change, minus space and time. Change actually and fully exists in the world of space and time.

This is step one on our way from territory to map. A real spatio-temporal change in the environment causes a real spatio-temporal change in one or more sense organs.

Does this get us across the boundary between Pleroma and Creatura? Probably not quite. The physical retina and the physical pads of my fingertips are certainly Pleroma. They can be analyzed in terms of physical forces and causal impacts as much as any part of the world can.

But they are either included in Creatura as well, or are on the very threshold of Creatura.

What happens next brings us fully into Creatura. But, observe, even this may not be leaving Pleroma behind.

ABSTRACTION

If difference is abstract, then how does abstraction come into existence?

It is the tradition of modern philosophy, following Descartes, who followed the neoplatonic scholastics and St. Augustine, that the generation of a concept, which is a full-blown abstraction, requires the existence of an immaterial substance to generate it. This immaterial substance would have to be free from existence in space and time just as the abstraction is.

Bateson got very close to resolving this ancient philosophical problem, but not close enough. If we combine the tools he left us with the neuroscience of today, we may be able to resolve this issue now.

When does abstraction begin? Gregory gave us the tool to understand this. Gregory taught us to notice the importance of collateral energy in the generation and propagation of information.

In the case of the retina, when changes in intensity of various wavelengths of light pass over the rods and cones, the neurons connecting them with other parts of the brain fire. The firing of a neuron is a case of the triggering of collateral energy. The neuron has its own energy in the ions of sodium and chlorine marshaled separately along its length. When the energy of the light on a rod or cone *changes*, the neuron is triggered. A stimulation of the nerve end starts a ripple which runs up its length using the neuron's own energy.

What, then, happens to the energy of the stream of photons that passed across each rod or cone? It is dissipated as heat within the eye once it has triggered the neuron's response.

The energy of the light that, in changing, triggered the response, is left behind.

This, we propose, is the first level of abstraction.

The ancients and mediaevals were astute in naming the process of going from the world to cognition-of-the-world, "abstraction." It means literally, "to drag away from," *abs-traction*.

The action of the neuron, using its own energy, energy that is collateral to the (changing) energy of the light falling on the retina, has *abs-tracted* the change from a change in solar photons to a change in neuronal firings.

If the light is high intensity (many photons) the number of firings-per-second is high. If the intensity is low, the firings are few. But in both cases, the energy of the photons is left behind. The changes are *abs-tracted* from the energy.

Now, if we are asked what comes across from the territory to the map, we would say *changes*. Changes in the environment are transformed into changes in the neurons, which are then transformed into changes in the firings of complexes of neurons.

These are still transforms of change, from one type of spatio-temporal change to another.

Pleromically, these are changes in one kind of energy, triggering changes in a collateral energy.

But *functionally*, these are transforms of *difference*. What comes across from the light on the retina to the visual cortex is transforms of difference, the energy and the original change in illumination is left behind, only the differences in illumination are retained.

This is initial abstraction. There are other types, too. When I hold a cup of hot coffee in my hand, my finger pads are physically made to curve in an iconic match to the curvature of the cup. Certain nerve endings embedded in the finger pads are triggered by this change of shape in the pads.

At the same time, the skin of these finger pads is warming up because of the transfer of heat (speed of molecules) from the porcelain cup to the fingers. Other specific neurons, that are unaffected by shape, are sensitive to changes of heat in the fingers. They are triggered to fire by the warming of the fingers. If, in addition, I squeeze hard on the cup, still other neurons in the finger pads, and in the joints of the hand, are triggered in response to the increased pressure.

All of these different neurons respond in the same way to increased intensity of what they are differentially tuned to, e.g., heat, pressure, shape, etc. They fire more often per

second in response to greater intensity of their specific input no matter what kind of input it is.

Nothing of the *quality* of shape, or of pressure, or of heat gets into the neuron. There is no difference in the bips that pass up the different neurons. Different types of sensation are all transformed into the same code.

But the brain can tell *which* neuron is firing at a certain intensity and because of this it is able to generate a sensation of heat from bips in one set of neurons and a sensation of pressure from an identical series of bips arriving from a different set of neurons.

The fact that different sets of neurons are tuned to different changes in the environment makes it possible for an extremely simple code to produce a rich and complex map.

This narrow-gauged tuning produces another type of abstraction, abstraction according to specific quality. It leaves behind a wide range of stimuli (unless their impingement happens to be extremely intense.) The specific tuning of a neuron brings the brain a specific difference, from the environment.

Summary:

Abstraction occurs when all wave lengths but one are tuned out – are ineffective at triggering a particular receptor. Abstraction occurs when all external stimuli – light

sound, pressure, temperature, texture of touch, odors and tastes, all are reduced to on/off events, to more or less rapid firings of neurons.

But primarily – more fundamentally than all these – we move across an important threshold when collateral energy takes over and leaves the original energy of the stimulus entirely behind.

THE EPISTEMIC CUT

But let us look more carefully. If we have successfully crossed from the Pleroma to the Creatura, we must have crossed what some have called, the “epistemic cut.” (Pattee, 2001)

Previously, we used the phrase: “But, functionally, these [changes] are transforms of difference.” The little adverb, *functionally*, is the pivotal word here. The triggering of collateral energy is not by itself Creatural, nor is it abstraction. Consider an avalanche of snow in the Alps. Where snow has accumulated precariously on a mountainside, a small amount of movement such as a rock thrown at the right spot, or even just the loud report of a firearm, has been known to trigger an avalanche. This is not “difference making a difference.” This is a small amount of physical energy unleashing a large amount of potential physical energy available in the overhanging snow bank.

So, too, the way the increased pressure of this pencil on my fingers unleashes the potential energy of the ‘pressure neurons’ going up to my brain is perfectly Pleromic. It is just an energy event. You can say there is a primitive abstraction in it because the original energy is left behind. But we cannot find any evidence in the physical processes themselves of an epistemic cut.

We are not yet at the point where there is difference that can make a difference as long as we look only at the triggering of collateral energy. We must look wider and see that “functionally, these changes are transforms of difference.” The way the triggering of neuronal firings is different from the triggering of an avalanche is that the neuronal firings are part of a large circuit of neural firings that will most likely eventuate in motor neuron firings stimulating actions back out upon the part of the environment that originally stimulated the sense organ. If the cup is too hot for my fingers, the very rapid neural firings will eventuate in my putting the cup down (or dropping it) to prevent my skin from a possible burn.

There is no way to distinguish neural triggering from an avalanche until a *whole circuit* comes to be. An “epistemic cut” requires that the neural triggerings be “about” something. What they are about is the original stimulating change in the environment. Once the circuit is complete and the organism moves to seek or to avoid, to act upon in some way the original object that stimulated the senses, then it is clear that the loop of changes in the neural circuit is, in a rudimentary sense, “about” the original stimulating

object. When the object of stimulus becomes also the object of response, when it both starts and ends the process, the process *points to* that object.

At this juncture we can say that what came from the territory to the map were *differences*, differences embodied and embedded as spatio-temporal changes in the interface between the environment and the sense organs. These embodied *differences* in the territory become re-embodied in the neuronal firings of sensory neurons, and re-embedded in subsequent neurons after each synapse-crossing.

This is why Gregory gave so much thought to circuits of differences.

But it is not clear that Gregory worked out a theory of “aboutness,” of intentionality, of reference. He was perhaps limited by the strictly syntactic nature of Shannon-information. Yet he had all the tools in his hand.

DING AN SICH

Perhaps the largest question in epistemology is: How can we know anything if we cannot know the *Ding an sich*, the thing-in-itself? Or, another way of putting it: If we cannot know the *Ding an sich*, do we know the natural world at all?

Gregory tended to say that we know images of the world, not the world itself. An epistemology of mediate realism says that we do not know our images of the world, but

we know the world itself *through* our images of it. Gregory cannot come to an epistemology of mediate realism because he has no developed theory of reference, no theory of intentionality or “aboutness.”

Let’s parse this problem more finely than Gregory did. The notion of the *Ding an sich* goes back to the scholastic philosophers of the 13th Century who used the phrase *in se* vs. *quoad nos*, a pair of philosophical jargon terms that are understood in relation to each other.

Any being or entity that is understood *quoad nos* is understood as it relates to us. We might say that the sun is a disk, *quoad nos*, as far as we are concerned, i.e., from our point of view. But the sun is a sphere *in se*, in itself, i.e., not relative to any particular observer.

But there is a subtlety here that must be examined.

When we use the phrase “in itself”, *in se, an sich*, we seem to mean the object or event without its relationships to other things. But the question is, is any object or event real without its relationships to other things?

Of course there is a difference between the relationship to a perceiver, i.e., the causal relationships that trigger perceptions, and the relationships that a thing has altogether, the sum of its relationships to everything (as Kant and Bateson point out). But, is it not the

case that we organisms perceive objects and events by means of the relationships that the objects and events have to other things?

The white egret is seen at dusk by virtue of the characteristic way light relates to the molecular patterns of its feathers. The crow is harder to see at dusk and may be missed entirely –because of the characteristic way its feathers absorb rather than reflect streams of photons. We perceive the mass of a paperweight by holding it in our hand. This perception is possible due to the attraction, the relationship, between the paperweight and the mass of the earth. Our perception of the mass of the object is due to the intrinsic gravitational relationship between it and the earth.

It is due to their relationships with other things that objects are able to be perceived by organisms with senses. But the fact that material objects have relationships to each other: reflectivity, resistance, momentum, gravitational mass, chemical reactivity, vibratory speed, resonance, etc. etc., is not extrinsic to them. It is intrinsic. To think any other way is to imagine an essence, as in the Aristotelian/scholastic tradition, an *essence* which is different from and mentally separable from the perceivable “accidents,” color, texture, shape, reflectivity, etc. This philosophy of essentialism has been left behind, undermined by scientific evidence during the 20th century.

Therefore, any thing *in itself* is a thing *with* its relationships. The idea of a thing without its relationships to other things is clearly just an idea. Such a thing cannot exist in the real world. It is an abstraction of the mind. So, we must conclude that the thing in itself, the

Ding and sich, has relationships. And it is precisely through (by means of) these relationships that the perception and thus cognition of the object occurs. Therefore, we *can* know/perceive the thing-in-itself, but of course, indirectly, through the medium of the senses and central nervous system.

The philosophical texts that have for centuries claimed that the thing *in itself* cannot be known are the result of a trick of words, a subtle assumption that the *real* things out there are somehow stripped of their relationality. As we have seen, a little reflection shows that this is absurd. The relationality of things in the world is intrinsic to what they are *in themselves*. Therefore, any *Ding an sich* that cannot be known only exists in our minds. The *Ding an sich* that cannot be known is precisely not a real thing in the world, but a mental construct, a figment of the conceiving mind. All *Dinge an sich* in the concrete world can in principle be known. Yes, known as *Dinge an sich*, as things in themselves.

However, they cannot be known directly, i.e., immediately, because nothing can be known without the mediation of the nervous system. But still they can be known *in themselves*, that is in their intrinsic relationships, through relationships that are inseparable from their intrinsic qualities, characteristics.

THE HANDS AND THE MIND

We do not know the outside object directly. But, if not directly, do we know it at all?

That is the next question? Or, do we only know images in our minds?

As mentioned above, Gregory tended to think we only know the images constructed by the brain. And he had no consistent or coherent theory of what, if anything, comes across from the territory to the map, from the Pleroma to the Creatura.

We have suggested that there is a missing element in his overall theory, the lack of which leaves him in this lurch. He has no developed theory of reference, i.e., he has no way of discussing “aboutness” or intentionality. But there is also another missing element, of equal importance. He does not distinguish between cognition of the Pleroma, which is necessarily indirect, and action upon the Pleroma, which is direct. Yet, a case can be made that he was right on the edge of both of these understandings during the last 10 years of his life.

We have concluded that the map is not the territory and become aware that I can never feel or see or hear directly the pencil that is in my hands. At most I feel changes in shape of my finger pads, in the position of my joints and muscles, and the moving of light and shade on my retinas. The pencil itself remains out there beyond my fingers and eyes, and seemingly beyond my ability to reach it cognitively. Once we have reflected on this fact it seems that there is nothing we can do. In fact, Gregory wrote exactly that, “...it is the *Ding an sich* and there is nothing you can do with it.”

But here he was simply wrong. The opposite is true. Exactly what we can do is *do something with it*. In *feeling* shape, pressure and temperature, our hands have only indirect access to the pencil, mediated by the central nervous system. But *in action* our hands have direct access and they can move and change the pencil directly.

This is a most important fact to keep in mind for epistemology. Because direct effects upon the Pleroma by our pleromic hands can influence the indirect cognitive access we have that is dependent upon neural encoding. That seemingly infinite distance between my map and the territory is bridged by the *direct* connection between my hands and the territory.

I can never feel the pencil directly, but I can break it directly.

Francis Bacon was the first to propose clearly that access to the secrets of nature will only come through experimental manipulation of the material world by means our hands and our instruments. As long as philosophers kept their hands off the world their observations could only go so far. The history of philosophy in the West is basically the history of four or five large theories. Over the last twenty three centuries, philosophers have proposed modified forms of these theories again and again.

But when the hands were finally brought into the quest for understanding, experimental science began an unending series of *new discoveries*, building each on one another progressively.

How does this work?

When we simply observe the world through our mediated observations, we can think that it is only our images and concepts that we know, not the world. But when we test our images and concepts by directly changing the material world that we seek to know better, we observe how these changes we produce in the world change our images in turn. We can conceive of how the objects we are observing might be constructed, and then directly dismantle them to see if we were right, or not.

It is the direct contact, the direct intimacy, of our pleromic hands with the pleromic world that gives our creatural images purchase on that world and renders our images and concepts veridical – if not by thorough-going validation, then at least by falsifying many of them and leaving those which we cannot experimentally falsify, after many attempts, as therefore likely to be pretty much as we conceive them.

It is through the simplicity and directness of action on the world that the weakness of our indirect cognitive access to the territory is strengthened. It is through the interaction of sensory observation and manipulation, followed by the invention and manual

construction

of instruments to improve our sensory access, followed next by more observation and manipulation that our maps progressively converge upon the world itself.

Thus, we become legitimately confident that we do not perceive merely our images, but we perceive the world *through* our images. Our knowledge of the territory will never have the transparency imagined by the naïve realist, but it begins to have what can be called “a functional transparency.” Ultimately, we *do* see, hear and feel the world—but indirectly. It is the directness of manipulation that confirms the functional transparency of our images.

We can thus, at last, conclude with Gregory, but now unambiguously, that there are *latent differences* in the Pleroma. We admit that we draw them out with our senses, but not with our senses working alone. The combination of the senses and our ability to change the world which will in turn change our images, which new images we can then use to guide us in changing the world again – these are the elements of a realist epistemology.

Gregory knew this, but did not perhaps perceive its importance as a confirmation of knowledge. His classic story of the man, the axe and the tree offers this lesson. But Gregory, focusing on the circuit of creatural differences, seems to have missed the lesson that when the pleromic axe changes the pleromic tree the creatural mental process begins to have purchase on the world.

Consider a tree and a man and an axe. We observe that the axe flies through the air and makes certain sorts of gashes in a pre-existing cut in the side of the tree.

If now we want to explain this set of phenomena, we shall be concerned with differences in the cut face of the tree, differences in the retina of the man, differences in his central nervous system, differences in his efferent neural messages, differences in the behavior of

his muscles, differences in how the axe flies, to the differences which the axe then makes on the face of the tree. (*Steps*, 464-5)

The second lack in his theory, the missing explanation of reference can also be seen to be remedied by the two-fold process of observation, manipulation, new observation, new manipulation – indirect, to direct, to indirect, to direct. It is through the directness of manipulation that the image is seen to be *about* the object in the world.

What assures us that our images are in fact *about* the object in the world is that our sensory images track the changes in the world that the hands initiate. What assures us that our constructed concepts of what the world is like are truly *about* the world is both the way the concepts guide action, and the way that, through this ability, they can be falsified by the results of manipulation in experiment.

As Gregory always maintained, it is the circuit that makes the mind.

I propose that something like this is the theory that Gregory was trying to articulate. By the end of his life it seems that he knew he had failed. An indication that he felt he had not achieved a theory of mediate realism is that, although he never gave in to subjective idealism, in the pages of his final book he gives in to fideism.

It is commonly thought that faith is necessary for religion – that the supernatural aspects of mythology must not be questioned—so the gap between the observer and the supernatural is covered by faith. But when we recognize the gap between *cogito* and

sum, and the similar gap between *percipio* and *est*, “faith” comes to have a quite a different meaning. Gaps such as these are a necessity of our being, to be covered by “faith” in a very intimate and deep sense of the word.

Then what is ordinarily called “religion,” the net of ritual, mythology, and mystification, begins to show itself as a sort of cocoon woven to protect that more intimate—and utterly necessary—faith. [AF,gb, 96]

CONCLUSION

There were a few linked issues that are both relevant to his work and linked to each other that Gregory did not address, amidst the very large number that he did. Along with *aboutness* and *reference* which he did not work on, there was *action*. At an informal seminar not long before his death I asked him to speak to a philosophy of action. He responded, “Well, you know I have never been much for action.” I suggested, then, that he might speak to a philosophy of non-action. He looked at me, and remained silent.

These issues of intentionality and action go together. As I have pointed out, his blind spot about action led him to miss the role of the direct access the hands have to the territory. In describing the man with the axe, he focused on the circuit of differences, i.e., the creatural aspect, not the ability of the pleromic axehead to directly change the territory.

We know the territory is there beyond our maps because it resists us. It resists our efforts to do things and our efforts to know things. But it does not resist absolutely.

The interaction of hand work and mind work has given us virtually all the understandings of nature that the sciences have offered. Each year, each decade we know more – not just a little more, but much more. Although it is true that the interaction of the pleromic hand and creatural mind brings our images into a closer fit with the territory only *asymptotically*, the clear evidence of *continually improved and improving* knowledge due to their interaction is the ultimate warrant for realism.

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