Husserlian Meditations and Anthropological Reflections: Toward a Cultural Neurophenomenology of Experience and Reality

CHARLES D. LAUGHLIN, PH.D.[1]
Carleton University
Ottawa, Canada
cdlaughlin@gmail.com

C. JASON THROOP, PH.D.[2]
Department of Anthropology, University of California at Los Angeles (UCLA) California
Los Angeles, USA
jthroop@anthro.ucla.edu

ABSTRACT

Most of us would agree that the world of our experience is different than the extramental reality of which we are a part. Indeed, the evidence pertaining to cultural cosmologies around the globe suggests that virtually all peoples recognize this distinction—hence the focus upon the "hidden" forces behind everyday events. That said, the struggle to comprehend the relationship between our consciousness and reality, even the reality of ourselves, has led to controversy and debate for centuries in Western philosophy. In this article, we address this problem from an anthropological perspective and argue that the generative route to a solution of the experience–reality "gap" is by way of an anthropologically informed cultural neurophenomenology. By this we mean a perspective and methodology that applies a phenomenology that controls for cultural variation in perception and interpretation, coupled with the latest information from the neurosciences about how the organ of experience—the brain—is structured.

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> *The naivete of speaking about "objectivity" without ever considering subjectivity as experiencing, knowing, and actually concretely accomplishing, the naivete of the scientist of nature or of the world in general, who is blind to the fact that all the truths he attains as objective truths and the objective world itself as the substratum of his formulae (the everyday world of experience as well as the higher–level conceptual world of knowledge) are his own life-construct developed within himself—this naivete is naturally no longer possible as soon as life becomes the point of focus . . .*
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> *For the transcendental philosopher, however, the totality of real objectivity—not only the scientific objectivity of all actual and possible sciences but also the prescientific objectivity of the life-world, with its "situational truths" and the relativity of its existing objects—has become a problem, the enigma of all enigmas. The enigma is precisely the taken-for-grantedeness in virtue of which the "world" constantly and prescientifically exists for us . . .*
> Edmund Husserl, *The Crisis of European Sciences and Transcendental Phenomenology*

INTRODUCTION

Most of us would agree that the world we experience is different in certain ways from the real world of which we are so much a part. We recognize that our senses provide only partial information about objects and events in our environment, and our understanding of our universe is limited by the structures of our nervous systems. We breathe air that we cannot see and take on faith that there is an invisible force we call "electricity" that fuels our lights and cooks our food. And we are not alone in this understanding. Indeed, the evidence pertaining to cultural cosmologies[3] around the globe suggests that virtually all peoples recognize this distinction—hence the virtually universal focus upon the invisible forces that animate everyday events. That said, the effort to comprehend the relationship between our consciousness and extramental reality (i.e., the way the world is apart from our knowing about it), including the reality of ourselves, has led to controversy and debate in Western philosophy for centuries.

THE PERSPECTIVE

In this article, we argue that a generative route to solving such debates lies in turning to a cultural neurophenomenological perspective. By this we mean an

application of a trained phenomenology that controls for cultural variation in perception and interpretation, coupled with the latest information from the neurosciences about how the organ of experience—the brain—is structured and operates.[4] Our application of a cultural neurophenomenology is intended as a corrective to at least three roadblocks to developing an accurate understanding of the experience–reality relationship; those being (1) naïve, untrained phenomenology;[5] (2) metaphysical assumptions based on mind–body dualism; and (3) ethnocentrism. These three hindrances are entangled. For instance, cultural conditioning may produce an individual worldview that is permeated with mind–body dualism and a thorough distrust and ignorance of introspection. Our own perspective is intended as a corrective to these hindrances in the same total sense. It is a perspective that realizes that skill is required to make introspection useful to science, it lodges the structures of experience in the body and its interaction with reality (thus taking full advantage where possible of neurobiology), and it is informed by the vast literature from generations of ethnographers. Our contention is that any account of the relationship between consciousness and extramental reality that is not informed from trained phenomenology, ethnology and neuroscience is going to provide only a partial account of this relationship. What is needed then is an approach that is equally capable of rigorously examining the basic existential structures mediating the complexity of human consciousness and sociality as it is of exploring the variegated and dynamic ways that such complexity is organized in everyday life.

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THE PROGRAM

We will begin the discussion with a brief history of some of the issues that have peppered past debates, including arguments over the distinction between primary and secondary qualities, over Kant's positing of the "thing-in-itself," and over solipsism and the problem of intersubjectivity. Then, applying an anthropologically refined Husserlian "epoche," we will isolate some of the basic properties of experience in the interaction between consciousness and extramental reality. We will then examine various cultural interpretations of "the gap" between experience and reality, and the probable neurophysiological structures mediating the variant and invariant properties of this relationship. We will focus upon a phenomenology of the body and will show that although there are indeed experiential roots to the notion of a phenomenological gap, the positing of an ontological gap makes little sense when we turn either to insights from phenomenology, to the ethnology of cultural cosmologies, few of whom admit to such a gap, or to neuroscience.[6]

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A BRIEF HISTORY OF ''THE GAP''

We are using "extramental reality," as a technical term. By *extramental reality* we are referring to both those aspects of reality that effectively transcend our subjective experience and those aspects of reality that serve to limit the range of possible experiences had by consciousness. In terms of the former, or transcendental aspects, we are referring to all properties of reality, including the state of our own being, as they are, apart from our knowledge or perception of them. This definition implies that there are properties and processes of reality that we as humans do not, and perhaps in principle cannot, know. To this end, extramental reality can be thought to consist of information that is either (1) "denied" us due to limitations inherent in the structure of our sense organs and nervous system, or due to limitations set by the state of our technologies and cultural standpoint, or (2) made available to us through our sensorium, which may or may not be augmented by cultural techniques or technologies.

With respect to the former, or limiting aspect, we are referring to those properties of reality that Edmund Husserl (1931) characterized as the "objective pole" of experience. According to Husserlian phenomenology, experience is structured between subjective and objective poles (see Ihde 1977; Berger 1999), where the "objective" varieties of experience are understood to correspond to those aspects of reality that can be grasped by any given experiencer regardless of cultural, historical, or social background. From this perspective, while there are certainly a number of differing ways that extramental realty can be grasped by any individual, the "objective" or "obdurate" quality of the extramentally given in experience serves to set a definite limit on the kinds of experiences that any individual can have. Of course it is also true that in the case of the perception of external objects, individuals can shift from perceptual to imaginary modalities and as such be relatively unencumbered by the impediment of the extramentally given.

It is important to emphasize that extramental reality is not limited to external objects, because processes of internal reality (i.e., the structure of the body and especially the functions of the nervous system) are also "extramental" in the sense used in this article. Indeed, when we speak of cognitive, affective, intuitive, or perceptual structures which place important constraints upon the organization of experience (see for instance Husserl's 1960, 1964, discussion of the structure of internal time consciousness), we are referring directly to aspects of the extramental nature of internal, somatic reality—in this case, temporal processing within the nervous system.

"The Gap" as a Trap

That said, it is also important to emphasize that in introducing the concept of extramental reality we do not wish to fall into the perennial trap of postulating

an insurmountable schism between our conscious experience of the world-as-given and the extramental world-in-itself. Positing such a gap is both phenomenologically naive (see also Throop 2003a) and, perhaps more importantly for us as anthropologists, a notion that is very rare among many of the communities we work with and learn from in the field. Yet such a gap indeed has been posited by some Western philosophers.

One famous case is to be found in the metaphysics of the 17th century philosopher, René Descartes. Indeed, Descartes' name is inextricably associated with an insurmountable schism between mind and matter—a view that often bears his name: "Cartesian dualism." For Descartes, existence consists of two substances, mind and matter. The two substances—the nonextended substance of mind which is understood to comprise ideas, and the substance of matter consisting of extension and motion—are so different in their respective natures that neither one has very much access to the other (Weissman 1996:152). Yet minds and bodies do interact by way of certain neural structures (primarily the pineal gland, ibid:153; also by way of nerves, Descartes argued 1996:106–107). According to Descartes' reasoning, we know what is going on in our bodies by way of interoception, like the feeling of hunger or pain (Descartes 1996:98). But we know our bodies only because we think about our bodies and apply ideas to sensed motions within our bodies. Minds think, bodies (as with all matter) move. We only know that we exist because we think—the famous *cogito ergo sum*, "I think therefore I am" dictum ("thought" used in the broadest sense to include doubts, conceptions, understandings, intentions, affirmations and denials, imaginations and feelings; Descartes 1996:66)—not because our bodies move. Thus mind (the realm of ideas) and extramental reality (the realm of extension and movement) exist independently of each other, and the relations between the two dominions are exceedingly difficult to establish.

Moreover, in the Cartesian paradigm the way we come to know things about each realm differs (Massa 1996:290–291). We know our minds by the application of concentration and intuition. Knowledge of mind is derived by becoming clearly aware of mind as a system of a priori (innate) ideas. Ideas do not derive from extramental reality; rather, we are born with them. However, that said, one cannot trust our senses pertaining to the material world, for quite often we find that we are wrong. We are easily deceived by our senses and thus must approach our knowledge of the material world with considerable doubt. The material world is really only knowable through experimentation designed to discover the underlying mathematical structures that mediate regularities of pattern. In fact, the relationship between mind and matter is so problematic for Descartes that his metaphysics requires the existence of a God who will never deceive us. Without that God, no certainly beyond "I think therefore I am" would be possible, and Descartes' metaphysics would slide into an ineluctable solipsism.

A similar gap between experience and extramental reality also figured famously in the debate between Bishop Berkeley and John Locke over the distinction between primary and secondary qualities. According to Locke (1979 [1689]), "primary qualities" are those qualities or powers adhering in objects that produce phenomenologically accessible ideas and sensations and that reflect the "actual" properties of the object *qua* object (e.g., extension, solidity, motion, rest, shape, size, etc.). In contrast, "secondary qualities" are those qualities or powers that produce phenomenologically accessible ideas and sensations that, while they are ascribed to the object, do not reflect the "actual" properties of the object *qua* object (e.g., color, taste, smell, heat, cold). Locke argues that these "secondary qualities" are causally produced by the action and interaction of the "primary qualities" adhering in a given object. Locke's distinction between "primary" and "secondary" qualities therefore establishes a logical "gap" between those ideas impressed upon the mind that serve to represent any given "material object" and the indirectly perceived mind-independent "material" that supposedly underlies and gives rise to those impressions.

In defending his doctrine of *immaterialism*, Bishop Berkeley is highly critical of Locke on this account. Indeed, in contrast to this perspective, Berkeley asserts that the "sensible objects" we perceive are not "representations" of imperceptible material objects composed of "primary qualities" but are directly perceived collections of mind-dependent ideas. In other words, Berkeley wanted to advance a "nonrepresentational" understanding of the perception of "things" which corresponds to a "commonsense" rendering of reality as consisting precisely of those qualities and sensations that are immediately perceived through our various sensory modalities (1988 [1710]). In an attempt to refute Locke's distinction between "primary" and "secondary qualities," Berkeley specifically argues that the

> *ideas we have of these [secondary qualities] they [Locke] acknowledge not to be the resemblances of anything existing without the mind or unperceived; but they will have our ideas of the primary qualities to be patterns or images of things which exist without the mind, in an unthinking substance which they call matter. By matter therefore we are to understand an inert, senseless substance, in which extension, figure, and motion, do actually subsist. But it is evident from what we have already shown, that extension, figure and motion are only ideas existing in the mind, and that an idea can be like nothing but another idea, and that consequently neither they nor their archetypes can exist in an unperceiving substance. Hence it is plain, that the very notion of what is called matter or corporeal substance, involves a contradiction in it.* [1988 [1710]:56 section 9]

Indeed, as Berkeley asserts, "when we do the utmost to conceive the existence of external bodies, we are all the while only contemplating our own ideas. But the mind taking no notice of itself, is deluded to think it can and does conceive bodies existing unthought of or without mind" (1988 [1710]: 61 section 23).

In Kant's *Critique of Pure Reason* (1990 [1781]) the distinction between primary and secondary qualities—as an expression of a conceived disjunction between reality and experience—is taken up again in the context of his analytical triangulation of fundamental categories of understanding (categorical a priori), the object of experience (phenomenon), and the thing-in-itself (noumenon). According to Kant's philosophy, the fundamental categories of sensibility and understanding (time, space, number, cause, etc.) are pregiven structures of the mind that give rise to and structure the stream of experience. As such these categories are held to be before, and in part generative of, the flow of phenomenal experience. In his view, it is the a priori structure of the mind that makes experience itself a possibility and thus serves to mediate all objects of experience for the experiencing subject. In his words, "cognition, which is limited to objects of experience, is not for that reason derived entirely from experience, but,—and this is asserted of the pure intuitions and pure conceptions of understanding—there are, unquestionably, elements of cognition, which exist in the mind *a priori*" (1990:95). It is due to the ever-present representational mediation of objects of experience through the filter of a priori categories of understanding that leads Kant to suggest that there will always be a permanent disjunct between the object of experience (phenomenon) and the thing-in-itself (noumenon). As he puts it,

> *the class of noumena have no determinate object corresponding to them, and cannot therefore possess objective validity. If we abandon the senses, how can it be made conceivable that the categories (which are the only conceptions that could serve as conceptions for noumena) have any sense or meaning at all, inasmuch as something more than the mere unity of thought, namely, a possible intuition, is requisite for their application to an object? The conception of a noumenon, considered as merely problematical, is, however, not only admissible, but, as a limitative conception of sensibility, absolutely necessary. But in this case, a noumenon is not a particular intelligible object for our understanding; on the contrary, the kind of understanding to which it could belong is itself a problem, for we cannot form the most distant conception of the possibility of an understanding which should cognize an object, not discursively by means of categories, but intuitively in a non-sensuous intuition.* [1990:165]

As briefly discussed above, Husserl also spent a considerable amount of time thinking through the relationship between experience and reality. Much like Kant, Husserl begins with a triadic distinction between *noesis* (acts of consciousness), *noemata* (contents of consciousness), and *hyletic data* (information

derived from extramental reality, aspects of which become the objects of our intentional acts). Unlike Kant, however, Husserl holds that there is always a potential for a partial confluence between *noesis*, *noemata*, and *hyle*, and as such takes an important step towards problematizing the "gap" between experience and reality. As Hintikka argues,

> *It is important to realize what is involved in the Husserlian quest of the immediately given and why it cannot be accommodated by any dichotomy between our consciousness (prominently including its intentional acts) and the intended objects. The idea that something about the actual world is immediately given to me implies that any such sharp dichotomy has to break down. What is immediately given to me will then at the same time be part of the mind-independent reality and an element of my consciousness. There has to be an actual interface or overlap of my consciousness and realty. This is the basic reason why any sharp contrast between the realm of noemata and the world of mind-independent realities ultimately has to be loosened up in Husserl. . . . According to Husserl, there is an actual interface of my consciousness and reality, that reality in fact impinges directly on my consciousness.* [Hintikka 1995:82–83].

We can certainly see from the above that the possibility of a distinct schism between the world-of-experience and the world-as-it-is can pose an enormous challenge to philosophers who strive to understand how mind and reality relate to one another. Let us now turn to examining the phenomenological roots of postulating such a gap.

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THE PHENOMENOLOGICAL ROOTS OF "THE GAP"

As we said above, there are phenomenological roots to the notion of a gap between experience and reality. It can be argued that these are the same roots in experience that give rise not only to the ubiquitous mind–body problem in science and philosophy (see Bunge 1980; Moravia 1995), but also to the pervasiveness of this distinction in the ethnology of peoples cross-culturally.[7] With respect to the latter, Shajian Wajai, a Jivaro Indian of Peru, is quoted as saying:

> *The people who say that we think with our heads are wrong because we think with our hearts. The heart is connected to the veins, which carry the thoughts in the blood through the entire body. The brain is only connected to the spinal column, isn't it? So if we thought with our brains, we would only be able to move the thought as far as our anus!* [Brown 1985:19]

Because of the link between mind–body dualism, and the notion of a gap between experience and reality, we would like to enter the problem by way of

the phenomenology of the body, and then extend the discussion to include intersubjectivity, and then all of extramental reality—keeping always in mind that our body—our soma, or physical body as opposed to our body image or self-concept—is part of our extramental reality. The phenomenology of the body has become quite sophisticated in the philosophical literature (see Welton's 1998, 1999, companion volumes for relevant articles), as have methods in experimental phenomenology (Ihde 1977). But our starting point will be quite basic so as to ground our argument in a set of experiences shared with our readers—a set of experiences easily attained through an examination of the phenomenology of grasping.

Phenomenology of Grasping

May we suggest that you try this little experiment: Lay your arm on the table before you and let it relax and your mind be as calm and thought free as possible. Then slowly flex your fingers, bunching them into a loose fist. Focus at first on both the external image of your hand grasping and the internal feeling of grasping. Look at your arm and feel the movement, and see how much of your arm is involved in the process of grasping. Then close your eyes and just feel the process of grasping from the inside. Feel where movements begin and end. Then use your other hand to feel your grasping hand and arm to track the muscle movements involved in grasping. Using all the visual, somaesthetic, and tactile information available to you, decide how far up your arm you can detect the movements. You will probably notice both visually and somaesthetically that the effort involves your fingers, hand, and forearm—that the act of grasping disappears somewhere around your elbow. In Husserlian terms, you are "bracketing" an aspect of your own experience of your body for phenomenological study.

What you want to do for present purposes is to become familiar with the physical processes that are involved in grasping something. Explore the movements in your hand and arm and bracket the boundaries to the activity that we call "grasping" and the limits of your awareness of what is happening during that activity. For instance, flex each finger independently and in combination with other fingers. Notice the different muscle movements that produce each combination. Notice how hard it is to flex your third and little finger at the same time without one or more of your other fingers moving as well. Also note that you cannot make a fist in the opposite direction; that is, toward the back of your hand instead of the palm side. You cannot will the hand to do what it is structurally incapable of doing. And if you were to tape your thumb to your palm, this would impose new limitations upon your ability to grasp objects. There are clear limits to the grasping movements you can make, and these limits are determined by the structure of your hand and arm.

Now, when you have explored the physical act of grasping, shift your attention to the mental act of willing your hand to grasp. Relax your fingers and then will them to grasp. You gaze at your hand and will it to grasp and virtually simultaneously with the intention, the hand moves. But now reflect upon the linkage between the will to grasp that arises within your conscious mind and the actual act of grasping by your hand. You may have already ascertained that the physical act of grasping occurs out at the end of your arm. You have seen that the grasping action stops at your elbow (or wherever). There is no obvious connector linking the physical act of grasping to the sphere of your will or awareness. And yet every time you will the act to occur, it does so, as if by magic.[8] This lack of any directly experienced linkage between the intentional act and the physical act of grasping provides experiential data indicating a mind–body, or an experience–extramental reality gap. If you will extend this exploration to your other bodily activities, you will discover that this gap is apparent in every one of them, from walking to opening and closing your mouth to blinking your eyes and typing on a keyboard.

If you have done this exercise seriously and with sufficient concentration, you have probably been able to bracket and directly experience your own mind–body gap. This can be a subtly profound realization. We become aware that although we have the freedom to will our hand to move, we cannot be sensually aware of the exact causal mechanism between our sphere of awareness and our physical hand and arm. Of course we all know something rationally about this linkage. We know our body comes equipped with a nervous system that connects the higher brain functions mediating our consciousness and intentionality, and the muscle groups that move our limbs. We take this physiological information so much for granted that it may well get in the way of bracketing the mind–body disjunction in direct experience and thus inhibit our intuitive comprehension of the gap. We may naively project the information we have of anatomy and physiology into our experience of the mind–body relationship and fail to appreciate the lack of any directly experienced link between our conscious will and our physical activity. Yet if you do the exercise while dropping any and all preconceptions—or, Husserl himself taught, if we "return to the things themselves" with fresh eyes—then this essential gap becomes obvious, and you can better appreciate why we suggest that this intuition is so fundamental to the metaphysics underlying philosophy and science, and why this kind of experience invites interpretation among all peoples—for example, it is very likely that Jivaro philosophers would argue that the link between willing and grasping is by way of the bloodstream.[9]

Phenomenology of Somatic Disappearance

We are not alone in proposing that invariant structures of experience serve to underpin mind–body dualisms in philosophy and science. Drew Leder in his important book *The Absent Body* (1990) sets out to establish a close phenome-

nological analysis of the experience of "bodily absence." A central goal of this study is to demonstrate why it is that Cartesian dualism, despite many recent efforts to dispel its status as an ontological truth, still seems to persist in many philosophical and practical endeavors throughout both academia and everyday life. Here Leder argues that while the Cartesian split between mind and body has been mistakenly reified into an ontology, it does express an existential structure of the lived body which always contains regions of bodily "presence" and "absence." Thus, the experiential sense of inner division that arises in the interplay of regions of bodily "presence" and "absence" becomes translated into a metaphysical doctrine of ontological dualism between spirit and matter, mind and body.

Building upon the gestalt account of perception as a structured field organized according to ever-shifting relations between figure and ground, Leder argues that absence not only arises in the background regions of our attention, but is also occluded at the point of origin from which all of our perceptual and sensory modalities stream outward to meet their various intentional objects. Working with Husserl's notion of the lived body as an experiential "null-point" (*nullpunkt*), Leder points out that the body and its various sensory modalities always holds the preeminent status of "an absolute 'here' around which all 'theres' are arrayed" (1990: 13). As he puts it, "as the center point from which the perceptual field radiates, the perceptual organ remains an absence or nullity in the midst of the perceived" (1990:13). It is important to note that not all regions of the body are relegated to a necessary status as "null-point" since it is also possible to use cross-modal reflection to attend to regions as an external object of attention. However, "insofar as I perceive through an organ, it necessarily recedes from the perceptual field it discloses" (1990:14).

Returning to the example of grasping, Leder explains that if I use my left hand to grasp my right, I will find that while the right hand emerges clearly as an object of attention that clearly displays a concrete experiential presence, the left hand that is performing the act of grasping disappears to my awareness as a thematic object of attention. Citing philosopher Michael Polanyi, Leder explains that here we are confronted with the "from-at" and "from-to" structures of experience which always display regions of subjective (from-at) and objective (from-to) phases (1990:15).

Bodily absence extends far beyond these externally directed perceptual and sensory modalities, however. Shifting from these "surface absences," Leder turns to explore the visceral absences that lie in the interoceptive realms deep within our body. Here the prevalent presence of absence is tied at least partially to the limited sensory receptors associated with our ability to monitor the workings of the inner depths of our somatic recesses. As Leder explains:

> *Interoception does not share the multidimensionality of exteroception. The latter utilizes five sense modalities which, though tightly interwoven in*

> *everyday praxis, have radically divergent spatiotemporal and qualitative properties. Interoception is not devoid of an expressive range and utilizes, physiologists tell us, a variety of sense-receptor types, including mechanoreceptors, nocioceptors, and even some thermoreceptors. Yet these are experienced as modulating a single dimension of perception, i.e., "inner sensation," rather than opening up distinct perceptual worlds . . . . In physiological terms, the viscera have a greatly decreased number and variety of sensory receptors compared with the surface body, as well as a limited repertoire of motor responses. Experientially, one notices a certain crudeness and generality to most of the messages received.* (1990:40)

These sensory attributes of our somatic depths lead to something like "spatial ambiguity," as well as "spatial-temporal discontinuity" as "the stream of interoceptive experience is marked by ineluctable discontinuities" and intermittent lacunae that display an impenetrable "shroud of absence" (Leder 1990:42). In this respect, unlike "the complete perception of the proprioceptive body, our inner body is marked by regional gaps, organs that although crucial for sustaining life, cannot be somaesthetically perceived" (Leder 1990:43).

Phenomenology of Intersubjectivity

One of Husserl's most significant efforts was to extend his inquiry into the relationship between experience and reality to the problem of intersubjectivity (see Duranti n.d.). While it is true that Husserlian phenomenology is grounded in a rigorous exploration of what is given to the experiencing subject, it is a mistake to assume that this approach necessarily leads to solipsism. As Berger and Del Negro note, upon reducing the stream of experience to its primordial phenomenological structures, Husserl finds that when I see the body of another person, I have what Husserl calls an "analogical apperception"—an experience of that body, not merely as object, but as an "other" subject.

> *The type "subject" [thus] emerges from the most primordial level of our experience—the sphere of "own-ness." While I recognize the individuality of my own subjectivity and the individuality of you as a subject, as subjects, your body and mine are inherently "paired" in experience. One implication of this idea is that the concept "subject" establishes the apperception of both "self" and "other," that the subject is not radically my own, but inherently social.* [2002:69–70; see Husserl 1950; see also Welton 2000:152–56]

A further implication of this observation is the idea that those occluded aspects of an "other" subjectivity serve to index a variety of extramental reality that arises immediately within our sphere of "own-ness" and yet simultaneously transcends it. The experience of intersubjectivity therefore affords an experiential basis for both empathetic understanding and intuiting the presence of a "gap" between experience and reality as we confront an "other" that often resists our will (see also Throop 2002:10–11; Hollan and Throop 2008; Throop

2008a). In other words, the seeds for developing an empathetic understanding of an "other" are rooted in certain basic existential structures in which the limitations and possibilities impacting my stream of consciousness are continuously and effortlessly extended to an "other" subject whose body represents, in Schutz and Luckmann's felicitous phrasing, a "field of expression" that gives us mediated access to that "other's" "'inner life,' his moods, intentions, etc." (1989:79; cf. Iacoboni 2008). Also, since that "other's" subjectivity is never transparently given to the experiencing subject, there is in the very experience of intersubjectivity an intuition of a "gap" between experience and reality. In the words of Schutz and Luckmann,

> *Some experiences present themselves to a person as self-related, others as other-directed. Everything that presents itself to a person as not from him, as not really his, he then experiences not as Self and as his own, but as an Other reality that transcends him. This reality need not remain alien to him; he can familiarize himself with it. But he does not have the choice as to what it is and what it is not. It is clear that even prior to any more sharply delineated boundary of experience, this "natural" distinction between Ego-related and Ego-transcendent experiences underlies knowledge concerning the "transcendence" of the world.* [1989:103]

With Husserlian phenomenology, we have thus a tradition in Western philosophy that simultaneously acknowledges and problematizes a "gap" between experience and reality. Despite this fact, a Husserlian rendering of the "gap" has yet to be given careful consideration by an overwhelming majority of present day social scientists and philosophers.

To sum up, whether it is in terms of carefully examining the phenomenology of grasping, the phenomenology of bodily disappearance, or the phenomenology of intersubjectivity, we are presented with a variety of experiential roots for cultural and philosophical understandings of a "gap" between experience and reality. That said, following Husserl (and to some extent Berkeley), we argue that extramental reality, is not a mind-independent "material" or "stuff" forever beyond our experience. Instead, our knowledge of reality is importantly based upon the interpenetration of percept and object within the field of awareness, whether that object is an inanimate cup of coffee or an "other" subject apperceived analogically. Of course, our lot as humans is to be perpetually limited by the partial, fragmentary, and perspectival state of our knowledge of the world, and as such, what we might term a "horizon of ignorance" perpetually ensures the "noncompleteness" of correspondences between our systems of knowledge and the objects and events in reality they intend (Ricoeur 1991:269).

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HOW DO PEOPLE KNOW WHAT IS REAL?

A fundamental sense of realism is impressed upon the human psyche, regardless of sociocultural background, due in part to at least five basic existential structures operating within the interaction between experience and extramental reality. These are (1) inherent cognitive-perceptual structures of the nervous system, or *neurognosis*, (2) the obverse qualities of *obduracy* and *affordancy* within the interaction, (3) the relationship between an essentially *feed-forward neurocognitive system* and the *trueing* of neurocognitive models (4) the recognition of *hidden forces* influencing and causing perceived events, and (5) the innate nature of basic *intersubjectivity*. It is our contention that all of these factors are operating in the interaction between experience and extramental reality for all people everywhere, and thus all cultures will construct their cultural cosmology in such a way that all of these properties are variously recognized and addressed. This does not mean that all elements of a cultural cosmology will be true. Quite to the contrary, as cultural cosmologies are human interpretations of extramental reality, they may include elements that are empirically false. But for the most part, elements of cultural cosmologies tend to be pragmatically satisfactory, for their function is to bring meaning to everyday events within the strictures of (at least) these five basic existential constraints. Let us examine each of these properties briefly and then we will be in a better position to return to the question of the gap, keeping in mind as we do so that these properties are not exclusive categories, but rather attributes of reality that interpenetrate in a systemic way.

1. *We Are Existentially "Wired" To Know the Real*. The notion that the human brain and nervous system form a blank slate upon which reality impresses itself is utterly false. Indeed, research in pre- and perinatal psychology and developmental neurophysiology shows that, although there is considerable plasticity in the growth of neural structures, their fundamental structures are genetically organized very early in the womb and the first months of life (Changeux 1985, 2002; Edelman 1987, 1989; Laughlin 1991; Varela et al. 1991; Edelman and Tononi, 2000; Fuster 2003). Modern neuroscience supports the view that the nervous system of each and every species complex enough to have a brain is born or hatched prepared to know reality from a distinctly species-specific way. So too with the human brain. We are born knowing the world from a very human standpoint, our world of experience being (in a sense) "already there" due to the intricate organization of neural structures and sensory systems already laid down at or before birth. Elsewhere (Laughlin and d'Aquili 1974:Chap. 5; Laughlin et al. 1990:Chap. 2) we have termed this inherent system of knowing *neurognosis*. Neurognosis labels the myriad ways that we are "prewired" to know ourselves and the world around us. Neurognosis

forms the basic "seed structures" (Piaget 1977 called these "schemas") upon which neurocognitive development occurs. Neurognosis also provides the program of possibilities and limitations of development within which plasticity of neural organization may and may not occur. To offer an example relevant to the phenomenology of grasping above, we do not have to learn to grasp—no one teaches us this ability. We are born with the ability to grasp. The internal "schemas" (or neurognostic structures) for linking intentions and actions are already in place, "already there" within the sphere of our experience. Eventually, of course, the development of our grasping skills may become quite advanced and subtle—we may become a concert pianist, a surgeon, a watch repairer, and so forth, by refining the basic schema already afforded by our genetically programmed facility for grasping.

Not only does neurognosis constrain and guide the development of knowledge in the individual person, it leaves its mark on the social institutions constructed and passed down by societies. In another article (Laughlin and Throop 2001) we have suggested that neurognosis lays the intuitive foundations for cultural cosmologies and is responsible for certain ubiquitous elements of these worldviews—elements such as the unity and interdependence of all things, the recognition of the hidden causes behind perceived events, somatocentricity (placing the human body at the center of the cosmos), a world of objects and relations among objects, and so forth. It is the entire package of these neurognostically conditioned elements that provides a foundational eidetic cosmology upon which individual cultural cosmologies are elaborated. And it is due to this inherent point of view that cultural cosmologies remain pragmatically true to extramental reality. In other words, not only persons, but our shared social life also reflects existential structures that arise from the fact that we are "wired" to know reality in a pragmatically adaptive way (please see Laughlin and Throop 2001 for this argument in greater detail).

2. *Obduracy and Affordancy*. Knowledge about extramental reality develops, especially in early life, in interaction between neurognosis and the dual qualities of obduracy and affordancy characteristic of reality. *Obduracy* has a very moralistic definition in the dictionary, but in philosophy the term generally means the quality of reality to resist the will and intentionality of the psyche. Keeping in mind that extramental reality includes our own being, then reflecting on the phenomenology of grasping offers an obvious example of obduracy. While we quite naturally can bend our fingers in one direction to make a fist, no matter how hard we wish to bend our fingers backwards (clenching a fist with the back of our hand instead of our palm), the real body resists our will. We can imagine making a fist backwards, but we cannot realize that image. Moreover, most of us cannot walk through walls without the aid of a door. Much of early development in infancy and early childhood has to do with exploring the

somatosensory limits of obduracy—the obduracy of the body and the obduracy of the physical and social world (Piaget 1980).

The other quality of extramental reality is affordancy. *Affordancy* is a term coined by the great psychologist, James J. Gibson (1977, 1979, 1982) to conceptualize the active interaction between experience and extramental reality. "Roughly, the affordances of things are what they furnish, for good or ill, that is, what they *afford* the observer" (1982:401). Again, "the *affordances* of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill" (1979:127). With respect to human beings, Gibson lists such affordances as the qualities of matter that allow manipulation and tool construction, height and substantiality of objects facilitating "sitting-on-ability," certain game animals provide tasty eating, and so forth. Interestingly enough, he also notes that the concept of the ecological "niche" may be understood as a "set of affordances" (Gibson 1977:69).

The development of knowledge about the world is a process of interaction in which things in reality afford the experiencing animal particular qualities relative to the animal's ability to model its environment. That means that the affordances of things in the world depend upon the physiological structure of the animal. A stick laying over a stream may afford adequate support for a squirrel wishing to cross over, but not for an elephant.[10] Flowers afford electromagnetic information in the ultraviolet range for honey bees, but not for people. Of course, when it comes to people, technology may intervene (in a very Heideggerian manner; see Heidegger 1977) to alter affordancy—for example, optical equipment may transpose ultraviolet information into the human visual range.

Obduracy and affordancy are actually obverse qualities of extramental reality in relation to the structure and limitations of the body and its nervous system. Both the body and the world present as obdurations and affordances to our intentionality and thus operate to guide the development of our knowledge about our body and our world. We encounter these qualities daily, as do all animals with neurocognitive systems. We only become aware of them when we run up against either resistance to our intentions or new opportunities we had not recognized before. Once we have adapted to (adjusted our neural models of) obdurate and affordant objects in the world, we generally lose all awareness of the distinction between our experience and extramental reality—again, a very Heideggerian process. Indeed, Heidegger (1977) noted that to the extent that tools are efficient, they tend to "withdraw" from our awareness. We lose track of the hammer and are aware only of the act of hammering, lose track of the automobile and are aware only of the act of driving. If the efficiency of the tool is suddenly lost, then we will again become aware of the tool as an object.

3. *Feed-forward Expectation and Trueing*. We step, as it were, into the world with a set of normally subconscious expectations about what the world will be

like—in a sense, we know extramental reality in the future tense (see Laughlin and Throop 2008 on the neurophenomenology of time-consciousness). We reach for the doorknob and expect it to be there and to turn. If it does not, it may bring us suddenly up short and require us to reevaluate our expectation. Every step we take, we are subconsciously assuming that reality will afford us support for our efforts. When that support fails (we slip on ice, step in quicksand, miss the stair, fall into an abyss), suddenly our awareness is upon our act of stepping and we have to reevaluate our assumption of support. One of the primary functions of the brain is thus to construct a world of experience that leads to individual and social adaptive action. Psychology has long understood that each and every interaction with extramental reality constitutes a test of how well our internal models of reality correspond to the obdurate/affordant nature of reality (Miller et al. 1960; Pribram 1971; Laughlin and d'Aquili 1974). It is this intimate and active *feed-forward* (as opposed to a static feedback) process that produces continuous adaptive adjustments to our experience of the world—what we have called the process of *trueing* our experience to the nature of reality (Laughlin and Throop 2001). Each subsequent interaction with reality operates to test our expectations and to true them relative to feedback from the world. This process is fundamental to everyday ways of knowing and usually occurs so smoothly that we are barely aware of it, if at all. Our nervous system is designed to know reality, and it works via an intimate and ongoing interaction which brings internal models into accord with extramental nature.

4. *The Hidden*. We may easily confirm in our everyday experience that many of the causal forces operating in events are invisible. Indeed, we know the world as much for what we cannot sense as what we do sense. As our exercise in the phenomenology of grasping demonstrated, the links between intention and movement of the hand—or for that matter, walking, talking, or most other intentional acts—are not all present to our introspection. Some links are hidden. Causal forces often require interpretation in order to make a linkage known to us. We flick a switch in one place and a light goes on in another place—the links between switch and light, and the electromagnetic energies they channel are all invisible within the sphere of our experience. Our knowledge of their presence is by inference and interpretation. No one of us has seen an electron, and yet the flow of electricity through wires is assumed to be real.

5. *Intersubjectivity*. Finally, we know the world through the intuition of intersubjectivity. We do not have to learn that there are others like ourselves in extramental reality, for part of our neurognostic makeup as social primates is a fundamental interest in the Other (see Iacoboni 2008). We are in fact born knowing the Other, knowing the Other to be apart from ourselves, and knowing that the Other constitutes a subjectivity to which we have no direct access (cf. Levinas 1998). Special areas of the human brain are neurognostically designed to process the face, the hands, certain movements like grasping and

speech. Others as objects before the mind are neurognostically treated differently than other non-Other objects. Recent research on "mirror cells" have shown that there are areas that respond in the same way to both our actions and the actions of the Other, laying the foundations in neural processing for the experience of empathy (Gallese et al. 1996; Iacoboni 2008; Rizzolati et al. 2008). These areas are dedicated to apprehending and knowing the Other (see Laughlin 1991 for more clinical and experimental evidence pertaining to this issue).

As briefly noted above, Edmund Husserl never embraced solipsism, and the principal reason that he did not was his appreciation of the phenomenology of intersubjectivity (Husserl 1931:105, 1960:120ff; cf. Duranti n.d.). He could see that knowing the Other as subject entails the intuition that the Other knows me as subject—that such interaction with a sentient being amounts to mutual intersubjectivity.

> *Whatever holds good for me personally, also holds good, as I know, for all other men whom I find present in my world-about-me. Experiencing them as men, I understand and take them as Ego-subjects, units like myself, and related to their natural surroundings. But this in such wise that I apprehend the world-about-them and the world-about-me objectively as one and the same world, which differs in each case only through affecting consciousness differently. Each has his place whence he sees the things that are present, and each enjoys accordingly different appearances of the things. For each, again, the fields of perception and memory actually present are different, quite apart from the fact that even that which is here intersubjectively known in common is known in different ways, is differently apprehended, shows different grades of clearness, and so forth. Despite all this, we come to understandings with our neighbors, and set up in common an objective spatio-temporal fact-world as the world about us that is there for us all, and to which we ourselves none the less belong.* [Husserl (1931 [1913]:105)]

In constituting my personal experience and my knowing you as Other means that I intuit that you are having experiences that I cannot directly access. Yet I not only know you in part as an object, I also know you by way of empathy (*Einfühlung*)—I intuit quite automatically that I am an Other constituted by you and for you in the same way that you, as Other, are constituted by me and for me (see Hollan and Throop 2008; Throop 2008a). I know that you cannot make a fist backwards, because I cannot do so. And what in reality resists my will, or affords me possibilities, I quite naturally and intuitively project (perhaps in error) upon your experience of the world. As Schutz and Luckmann explain,

> *Others are those "behind" whose exterior and inwardness is found, as in me. A body that could show an inwardness as my body does, movements that could be acts, just as are similar movements of mine: all this triggers the*

> *meaning-transference. In further experiences the transference is confirmed for the most part as if spontaneously; occasionally, incongruent experiences convince me that I was wrong . . . . Now, I experience myself from within as turned to the outside. Naturally, I do not experience the other person from within, but, from the outside, yet not as a mere exterior, but rather as an interior that is turned toward the outside, at the moment even toward me. In the natural attitude I take it for granted that his inner life is not immediately accessible to me . . . . [However], I "know" that the Other indicates his inner life in his exterior to me now. I also "know" that he "knows" that my inner life is embodied in the exterior that is turned toward him.* [1989:113].

The Crucial Role of Interpretation

Clearly then, how people know what is real involves a complex interaction among perception, cognition, somatosensory and emotional experience, bodily motility, and the natural world's properties of affordancy and obduracy. The main point we would like to underscore is the crucial role of interpretation in producing or eliminating the sense of a mental–physical gap (see Reyna 2002 for an excellent discussion of the central role of the brain's interpretive functions). Now that we have played with the experience of grasping, we can easily understand how someone might conclude—as philosophers have done from the time of the Ancient Greeks, through the writings of Immanuel Kant to, say, Karl Popper (1994) with his metaphysical "World 3" epiphenomenalism—that mind is one thing and body another, or mental stuff is different than physical stuff. We may just as easily understand that someone else might conclude—say our Jivaro informant above—that the mental and the physical are all part of the same system, the body. The principal difference is in the interpretation of our respective experiences. Interpretation, as it were, fills in the "gaps" in information provided by pure experience alone. The act of interpretation injects information apart from that available in pure experience (again, as Husserl would say, "the things themselves") and which becomes incorporated within the "natural thesis" about the experience: that is within the bundle of culturally and personally conditioned information which intrudes upon and accompanies the experience of events in everyday life. As we have seen, it is possible with proper awareness to work to hold our interpretive operations at bay and examine the immediate experience generated by various physiological systems in the body.

Interpretations of "the gap" abound in philosophy and science, and of course among the cultural cosmologies of peoples everywhere. Logically speaking, interpretations may range from solipsism at one extreme to naive realism at the other extreme. Solipsism views the world of experience as all that exists—there is no such thing as extramental reality, and if there were such a reality, how could we possibly know it anyway? Naive realism by contrast would say that all

that exists is extramental material reality that impresses itself somehow upon a receptive mind. There are proponents of both these extremes in philosophy, but very few real scientists would view either option seriously, and we are aware of no traditional society whose cultural cosmology would agree with either position. Indeed, most people hold to some form of *interactive realism* in their very pragmatic approach to everyday life, and that realism derives from a blend of their society's ethno-logic and their own personal development, together with their daily encounter with the basic existential structures of reality discussed above.

■

CULTURE AT THE GAP

It is fair to say that most people interpret experiences in accordance with the worldview they acquire during enculturation as children.[11] Yet the interaction between a society's culture and a person's individual experience is often obscure in anthropological discourses. This is why we have endeavored to define the concept of "culture" in a way that facilitates the simultaneous discussion of institutionalized knowledge and individual experience (see Laughlin and Throop 2003, 2006). Of course, we are not the first theorists by any means who have tried to get away from the standard "learned and shared" textbook definition of culture. Many anthropologists have found it useful to view culture as a system of information (e.g., Roberts 1964; d'Andrade 1995; Shore 1996; Reyna 2002), and this is an orientation that we can use here to good effect.

Culture as Information

Perhaps the first to grasp the real power of this perspective was Ward Goodenough (1954, 1971) who shaped his model of culture by analogy from genetics. As a species consists of a gene pool, so also do societies form a "culture pool" —or information pool—of potentially shareable knowledge for its members (Goodenough 1971). People learn their culture (they become enculturated) as individuals, and no one individual learns all the information available within his or her society's information pool. Indeed, as Anthony F.C. Wallace (1970:109–120) has shown, social adaptation for all societies requires an organization of cognitive diversity such that the information within each person's repertoire becomes functionally integrated with the information located in the repertoires of other group members. In other words, members of a society tend to learn whatever they need to know to be a recognized and functioning member of the society, but that does not mean that any one member attains all the information in his or her culture pool. Thinking of "culture" as an information pool allows us to integrate socially influenced and shared interpretation into our understanding of how the experience–reality interaction occurs. Of course

we are not limiting the notion of information to that produced by ratio-linguistic processes. Rather, we are using the term in the broad sense that includes imagination, symbolic meaning, emotion, patterned behavior and responses, intuition, and thought—indeed, the full panoply of ways that people come to know and interpret within the context of their daily experiences.

For example, people's culture will thus predispose (rarely perhaps determine) them to interpret certain domains of experience in certain ways. If people are raised for instance in North American white protestant culture, it is probable that they will tend to ignore their dreams, and when they do remember a dream, they will tend to either be confused by its meaning or impose some kind of psychodynamic interpretation upon the dream's motifs. On the other hand, if one has been raised in Australian Aboriginal society, one would tend to pay great attention to one's dreams and tend to interpret events in terms of separation of their spirit from their body during sleep (see Laughlin, McManus and Shearer 1993; cf. Hallowell 1955). And so it is with how people interpret the relationship between their experiences and reality.

It is important to note here with Leder, however, that "[c]ultural variations are always played out upon the keyboard of possibilities presented by our corporeal structure. Only because the body has intrinsic tendencies toward self-concealment could such tendencies be exaggerated by linguistic and technological extensions" (1990:3). And moreover, cultural "variations are possible only within, and are limited by, the common structure of the human body. Its sensory organs, its forward directedness, its muscular capacities, are prearticulations upon which all cultures must build" (1990:29). Here the cultural patterning of attention (see Throop 2003b, 2008b) is understood as a central mechanism through which to differentially conceal and reveal the workings of various somatic and sensory modalities. As Leder states, "through a heightened focusing of attention, I can increase my awareness of visceral processes. Certain dim sensations that I had never noticed—the feeling of my pulsing blood, the depths of respiration, the subtler reactions of my stomach to different foods—can be brought into experience by conscious effort. As cultural variations show, a certain degree of visceral disappearance can be attributed to Western insensitivities and overcome by a systematic development of powers" (1990:43).

Moreover, building upon Husserl's attempt to utilize the phenomenological method to elucidate the invariant structures of experience, Leder presents us with the notion of a "phenomenological vector." According to Leder, a "phenomenological vector is a structure of experience that makes possible and encourages the subject in certain practical or interpretive directions, while never mandating them as invariants" (1990:150). In this light, the final structure and meaning of these regions of possibility depend largely upon the cultural field within which these phenomenological vectors present themselves. In this

way, "the vectors established by the lived body, and the cultural context in which they unfold, are mutually engendering structures" (1990:152). From this perspective then, a cultural model that may have been "suggested" by the lived structure of the body can recursively feedback to further highlight and elaborate those somatic experiences that most accurately correspond to the model in question.[12]

Above, we suggested that there were at least five basic existential properties operating within the interaction between experience and extramental reality for people everywhere: (1) an inherent sense of the real (the brain "wired" to know reality), (2) the qualities of obduracy–affordancy, (3) a feed-forward cognitive-perceptual-activity loop that operates as a test of the truth, (4) the recognition of hidden causation or forces behind observed events, and (5) an inherent sense of intersubjectivity. Let us return to these properties and examine how culture may influence the interpretive process relative to each property—keeping in mind that the distinctions we are making here are for analytical purposes and probably do not reflect the style or metaphorical content any particular culture's ethnologic.

1. *Culture and the innate sense of the real*. There is no such thing, so far as we can determine, as a naturally occurring solipsistic culture. In fact, all peoples seem to be natural realists and even pragmatists[13] to a considerable[14] extent. Languages all over the planet reflect the capacity of the human nervous system to process information in an innate way—for example, in the visual perception of the electromagnetic spectrum and the codification of basic color terms (Berlin and Kay 1969; Kay 1975). Also, people everywhere tend to perceive time in much the same way, as both linear and cyclical processes (Malotki 1983; Gooddy 1988; Laughlin and Throop 2008). Likewise, human perception of space is usually somatocentric—that is, perceived relative to the individual body, and is more often than not coded in language in terms of the cardinal directions (Laughlin 1997a, b). Also of interest is that few peoples bother to correct the grammatical errors of children—the assumption being that children will eventually develop adult speech patterns on their own (see Ochs and Shieffelin 1984).

People do not have to learn to be realists from scratch, for it would seem that babies enter the world with the innate knowledge of objects, movements, relations, special objects like hands and faces. Extramental reality is, as it were, "already there" for both the pre- and perinatal developing brain (see Laughlin 1991 for a review of evidence for this claim). Reality is there in both the physical and the social sense. Babies have already begun to interact with the range of speech sounds they hear in the womb and are born adapting their own vocalizations to that auditory range. The baby (at least, of any species with a sizable brain) is in a sense an organism prepared and designed by evolution to interact with and model extramental reality by the process of repetitive action (see

Quinn 2005). All human cultures include a body of information about what babies are, how they are to be treated, how much leeway they are to be allowed in exploring the world, who is to take care of them, and so forth. Societies differ of course in the details of the information they provide or impose upon care givers and present to developing babies relative to the child's experience (see Ochs and Shieffelin 1984; Laughlin 1989a). Some societies place babies on cradle boards, others hang them in a shoulder sling at the breast. Some societies require the mother to be the primary caretaker, while others ascribe that role to another family member or family members. Some societies hold that the baby is a conscious being who is capable of communication, while other societies hold that the baby is preconscious and the sounds it makes are meaningless babble.

The details of cultural views of socialization certainly differ a great deal from society to society, but one thing they all seem to have in common is the understanding that the baby is growing and must be allowed to explore the world within whatever boundaries are set by the cultural view. The typical pattern is to protect the baby while allowing it to explore further and further afield, to the limits of its physical and mental capacities.

2. *Culture and obduracy–affordancy*. Culture obviously plays a fundamental role in determining how people interact with the possibilities and limitations presented by both their environment and each other. A society's cosmology will normally indicate in broad strokes what is possible and what is impossible in terms of normative behaviors and causal efficacy. With respect to daily experience, such indications will more often than not be grounded upon some set of empirical evidence—either ongoing experiences or experiences recalled from the past. For instance, among the So people of Northeastern Uganda, there is the belief in a pesky demon called a *tegwech* which is said to dwell in pools of water. Although invisible to people, the *tegwech* can see people and may attack them and make them seriously ill. Consequently, the So avoid wading into deep pools and only use shallow streams for sponge baths. As it turns out, pools of water in their locality are infected by liver flukes which cause bilharzia in humans. The symptoms of bilharzia and *tegwech* sickness are much the same.[12] Likewise, we in North America subscribe to a culturally provided belief in "germs" that are understood to cause a wide variety of illnesses. Individuals avoid eating certain foods, keep their kitchen space clean, and wash their hands regularly in order to avoid contact with these unseen disease-producing agents. Yet few people have actually seen a "germ." Their existence is taken for granted as a staple entity in our worldview, and as an adequate account of the painful fact that reality affords us with diseases.

Disease-producing entities in extramental reality, usually hidden from the unaided human eye, are a common example of environmental obduracy and affordancy. People have learned and coded information within their worldview to avoid clashing with often dangerous and deadly processes in the world.

Moreover, people have also discovered and passed down within their culture pool knowledge of herbal and other remedies for diseases afforded by their local environment (Kleinman 1980).[15] Obviously, there are potential remedies available in the environment that people have failed to discover or to pass down to subsequent generations. Culture thus plays a role for the group in what reality affords and what it does not. Extramental reality only affords useful resources when people are prepared to recognize them as such (Gibson 1982:404).

3. *Culture and truth*. Culture and individual experience interact through what we have called a *cycle of meaning* (Laughlin et al. 1990:214–233). Transmission of cultural information is largely a matter of negative feedback. As Alfonso Ortiz (1972:135) has noted, the associations, principles, and assumptions upon which most cultures are founded are rarely worked out or criticized by the majority of people living in that culture. Rather, most people accept and participate in accordance with the worldview they inherit from their elders. This participation results in real-life experiences that are in turn interpreted in terms of the cultural perspective, thus completing a negative feedback loop which instantiates the information pool in individual experiences and which also confirms the truth of the people's system of knowledge. Where social control of interpretation is deemed critical, this negative feedback is accentuated within a society's *myth–ritual complex* (see d'Aquili et al. 1979; d'Aquili 1982, 1983; Laughlin and Throop 2001; Throop and Laughlin 2002) where tighter controls over the dissemination of information and the ritualized context of individual experience tend to accentuate negative feedback into the society's cosmology.

However, transmission of culture in everyday life (particularly outside of the myth–ritual complex) is rarely a matter of simple replication. Because culturally provided information comes alive, as it were, as meaning in the ongoing stream of individual experience, information derived from the cultural information pool is combined with information derived directly from extramental reality—that is, information conditioned by reality's obduracy and affordancy—in such a way that the feed-forward nature of consciousness operates as a test of the truth of socially specified meaning. Reality and culture blend in the crucible of everyday individual experience. Remembering that the nature of reality's obduracy and affordancy may change, either from reality itself, or from altered social conditions (e.g., diffusion of extracultural information into the information pool, technical innovation, etc.), the merger of cultural and extramentally real information in individual experience eventually may result in both a trueing of the information pool and culture change. This is how culture becomes revitalized (Wallace 1966, 1970). As the world changes, as new information finds its way into the culture pool, and as the conditions operating to delimit individual experience changes, how people interpret their world may subtly (or even radically) change over the course of generations (see Sahlins 1981, 1985, 1995).

This said, we must also emphasize that particular individuals within any society may create new possibilities that may be picked up by other group members and lead to new information within the culture pool. Change in possible forms of information available for a given community or group does not just come from novelty in culture-reality interactions, but may also be a product of the individual mind—the creative and complex mind of any particular individual who is able to create novel formulations that, given the right social conditions, may serve to impact and alter that individual's society's worldview. Such a potentiality for change is associated with what Douglas Hollan (2000:543) has termed the "experiential or subjective potential of a population." In his words, "Subjectivities and self-states that are marginal or subdominant today may prove to be adaptive in the wake of technological or social change in the future" (Hollan 2000:543).

4. *Culture and the hidden*. All peoples recognize the existence of domains of reality that cannot be directly sensed, and it is one of the principal functions of mythology and religion, as well as science, to account for these hidden aspects. In societies such as the Navajo in the American Southwest, myth reveals and gives a face to the hidden—a countenance that may be contemplated, that is "pleasing to the mind," that may be enacted in ritual, and that may be imagined in daily life as the efficient cause of significant phenomena and events. And like peoples everywhere (see Guthrie 1997; Winkelman 2000, 2004, on the universal projection of self and anthropomorphic images upon hidden forces), traditional Navajos project human and humanoid animate images upon unperceivable extramental processes. Navajo myth holds that all perceivable objects in the world have invisible aspects that are imagined as "Holy People"; for example, the Mountain People, the Star People, the River People, the Rain People, the Corn People, and so forth. For some Navajo thinkers today, these Holy People are metaphors for the usually hidden and vital element within all things, and which traditional Navajo philosophy equates with "wind" (*nilch'i*; see McNeley 1981). Individual people too have such a hidden spiritual dimension called "the Wind within one" (*nilch'i hwii'siziinii*). All these winds are really part of the one all pervasive Holy Wind. The winds within objects are never distinct entities, and there is energy flowing in and out of even the most apparently enduring things. It is the coming and going of wind that accounts for the tapestry of reciprocal causation typical of the Navajo understanding of the cosmos. The choice of "wind" as the central metaphor is an explicit recognition—common to many cultures on the planet (see, e.g., Mimi George 1995 for the Barok, Carol Lederman 1991 for the Malay)—that there are forces that normally cannot be observed, save by inference from their effects.

And of course, scientists do much the same thing by using metaphors to label and describe characteristics of the hidden. They speak of "fields" of energy (meaning among other things that all energies are extended and entangled), or

the quantum "sea" (meaning that quantum energies are everywhere, permeate everything and are thought of in terms of "waves"). They refer to violent eruptions of matter in the sun as solar "storms," and invisible areas of incredibly dense mass as "dark matter." And of course astronomers carry over the ancient Greek and Roman practice of organizing the heavens into constellations that superimpose totemic and mythic images like the winged horse, the bull, the bear, dragon, fish, etc. onto patterns of stars. In other words, scientists, like Navajo people and virtually all other peoples on earth, make sense of the hidden and mysterious dimensions of things by projecting images and concepts that are familiar to us in stories and in direct experience (see Ochs et al. 1994, 1996).

5. *Culture and intersubjectivity*. Clearly culture plays a major role in shaping an individual's interpretations of observable expressions and actions of the Other. Indeed, as the great psychological anthropologist Irving Hallowell noted long ago, while categories of "self" and "other" should be considered fundamental orientations provided in every culture, there are multiple ways in which the relationship between one's own and another's mind are articulated cross-culturally. In his groundbreaking article, "Ojibwa Ontology, Behavior and World View" (1976 [1960]), Hallowell argues that the familiar Western dichotomy between animate and inanimate objects should not be considered representative of the worldview of other cultures. For instance, he points out that for the Ojibwa the category of persons is extended to include both human beings and persons of an "other-than-human" variety. Tied to this understanding of persons is the Ojibwa view of social relations as similarly extended to encompass interactions with what many Western observers might characterize to be inanimate objects (e.g., rocks, sun, thunder). Moreover, Hallowell attempts to demonstrate that for the Ojibwa the concept of causality is integrally linked to actions of persons, such that "any concept of *impersonal* natural force is totally foreign to Ojibwa thought" (1976: 367). Through these descriptions of the action, interaction, and constitution of classes of persons, Hallowell attempts to lay the foundation for giving intelligibility to a culturally constituted orientation to intersubjectivity that clearly defies a number of assumptions that are taken for granted in many "Western" societies.

Moreover, we are all symbols for each other. That is, the process of perceiving the Other involves, within the culturally received "natural attitude," a system of meaning that is associated with the presence, the image, or the idea of the Other—in other words, meaning is "projected upon" the Other. It has long been a central dictum of social anthropology that a society is a "system of statuses." I not only perceive the Other, I also perceive the Other as an exemplar of social categories (male or female, youth or elder, Irish, Russian or Arab, teacher or student, married or single, rich or poor, Christian, Muslim, or Jew, etc.). These attributions condition my perception of and interaction with the Other.

Of course, as Schutz and Luckmann (1989:75) explain, "In acts of thought others are grasped by means of various typifications that, however, as we have seen, can aim either at the other person's typicality or at his uniqueness."

Furthermore, I automatically assume that similar attributions are being projected upon myself. Not only are we symbols for each other, the symbolic relationship is always reciprocal. I naturally make the assumption that I am being constituted as a social symbol by and for the Other in the same way that I am constituting the Other for me. The power of such attributions over the course of a child's development is well known in social psychology, as is the influence of intersubjective projections upon a developing sense of identity and ego formation (Jaspars et al. 1983).

Again, it is important to remain cognizant of how culture can play a role in differentially patterning the ways in which individuals tend to perceive and interpret their interactions with an Other. An important window into the distinctive structure of culturally mediated intersubjectivity can be found in the context of any given culture's ethnopsychology and theory of emotion (see also Laughlin and Throop 1999; Throop 2008b). For instance, in American ethnopsychology there are often discrete groupings of emotion terms that are differentiated according to their relative intensity (e.g., "upset," "mad," "angry," "furious," "enraged"), a categorization that can be arguably tied to a culturally mediated understanding of intersubjectivity wherein access to an Other's internal states is not considered very problematic. By contrast, in Yapese (people living on the island of Yap in the Federated States of Micronesia) ethnopsychology, it appears that one of the most salient distinctions made regarding the emotion of "anger" is tied to the extent to which, and the communicative channels through which, "anger" is expressed to an Other. Indeed, there are a number of terms in Yapese that can loosely be glossed as varieties of "anger." Examples of these include (1) *malaalngaen'*—"anger/annoyance/irritation" that is often undetectable by an observer, that is not expressed verbally, but can on occasion be detected through facial expressions, tone of voice, or the fact that a person is shaking his or her leg while seated; (2) *thung*—"anger/frustration" that is readily detectable by an observer through the person's facial and bodily expressions and tone of voice but is not expressed through explicit utterances; (3) *damuumuw*—"anger" that can be either expressed or not expressed verbally; and (4) *puwaen*—the explicit verbal expression of "anger." While it is true that these terms do index qualitative differences in the type and intensity of *anger*, it also appears that a more salient distinction concerns the extent to which each variety of "anger" is detectable through either indirect/nonverbal or explicit/verbal means. To wit, these terms can be understood as culturally elaborated linguistic vehicles highlighting various degrees of explicitness in accessing the contents of an Other's internal subjective state (in this case their subjective state of anger) (see also Throop 2008a).

■

TECHNOLOGY AND THE GAP

Recalling our little experiment in the phenomenology of grasping, we can easily see that in the normal course of our lives, most of us automatically fill in "the gap" between intention and act by reference to our knowledge of physiology. For many who have been raised in North American and European cultures, knowledge of physiology likely derives from a scientifically informed, materialist worldview, taught to them as children in school and reinforced by books and TV programs. Although people rarely think much about it, their view of their body is informed from cultural information derived through the intervention of various technologies used during different periods in their society's history; for instance, tools used in professional medical dissections, X-ray machines, MRI machines used to examine brain functions, and numerous other laboratory technologies. As we mentioned above, because of the way Euro-American-Aussie folk are enculturated, they will tend to interpret "the gap" between mind and body to be absolute. Physiology tells us a lot about how nerve impulses and muscle contractions work, but has little to say to most people about how our "mind" interacts with our "body."

Many peoples from non-Euro-American-Aussie cultures also apply technologically mediated information to their interpretation of "the gap." For example, due to their anatomical explorations during hunting and warfare, the Desana of Columbian Amazonia have acquired a good deal of ethnoneurological information about how the brains of humans and animals works (Reichel-Dolmatoff 1981). They observe, for example, the similarity between the brains of monkeys and human beings (ibid:76). They know from head injuries among humans and among animals that certain kinds of brain damage will influence behavior in discrete ways. Their word for brain, *dihpu ka'i*, glosses "head-mind," and incorporates the root *ka'i*, "essence of awareness." The convolutions (*kae*) of the cortex are conceived as distinct compartments (ibid:82) which correspond to aspects of the mind. The metaphors they use for how the brain works include a crystal made up of many smaller crystals and a honeycomb containing many cells. However conceived, the different compartments are associated with the discrete qualities and functions of mind for which they are named (e.g., "the yellow place," "the place of rough stones," etc.; ibid:83) and are connected by "threads" that transmit energy from compartment to compartment.

Likewise, the Hausa of West Africa have developed an understanding of the physiology of the body, including the various organs and the brain, during the course of butchering animals (Wall 1988:176). The term *kwanya* refers to both the back of the head and to the entire brain. However, unlike Desana ethnoneurology, Hausa knowledge of internal anatomy is quite limited. "The major internal organs all have names but, as the operation of these organs is hidden

from view in a way that the external structures of the body are not, ideas pertaining to their functioning are quite mixed and are subject to a great deal of individual elaboration" (ibid:178). The head and its contents is considered the "chief" of the body. Sense, reason, and judgment (*hankali*), memory (*tunani*), reflection (*waswasi*), and thought (*tsammani*)—all necessary for well-being (*lafiya*)—are located in the brain. The Hausa do know that when the brain is damaged or diseased in some way, these conscious functions may become impaired and well-being lost. Loss of judgment (*hankali*) within the brain results in madness or loss of control (ibid:179, 204–205).

The forms of knowledge that technologies mediate is integral to both a society's cultural information pool, and to the extramental reality in which they live. Technology itself constitutes an alteration of that relationship—especially as it intervenes in the experiential aspects of that relationship. As the philosopher Martin Heidegger (1977; see also Ihde 1990) pointed out, put a hammer in a man's hand and the whole world begins to look like nails. Intentionality is fulfilled in action, and both the kind of action and the perceived effects of action feed back into intentionality. Technologies are in a sense "artifacts of knowledge" (Laughlin 1989b)—they are alterations in material reality that, accompanied by meaning in peoples' minds, facilitate intentional acts. As such, technologies become part of the extramental reality in which we are embedded and to which we must adapt. The ancient Greeks were very interested in astronomy, but the telescope had yet to be invented. As a consequence, Greek scientists recognized the existence of stars only to the 6th magnitude, the faintest stars visible to the naked eye under the best conditions for observation. By contrast, present-day astronomers live in an environment rich in images of celestial bodies far fainter than can be seen with unaided eyes. Indeed, on the internet we can download images captured by the Hubble telescope as faint as magnitude 30 or so.

Perhaps the work of Clifford Geertz (1973) may help us broaden and amplify this question somewhat. Geertz notes that the products of collective mental activity (artifacts, tools, communicative systems, pieces of art, material texts, etc.) and the social processes through which these products are brought into being, must be considered part and parcel of the (extramental) environment in which the human mind evolved. According to Geertz, it is only once we admit the context of an environment tangibly modified by human sociality and techniques that we are able to properly assess how selective pressures could begin to favor those individuals best able to create, acquire and manipulate such artifacts. It is important to note that for Geertz, "cultural artifacts" include not only such physical products as "tools," but also the systems of significant symbols and cultural "programs" which serve to direct and influence human interaction. In other words, Geertz proposes that it is impossible to understand the evolution of the human psyche without taking into consideration the extent to which the

environment, which serves to establish the parameters for natural selection, is thoroughly permeated with and altered by the cultural products of an increasingly complex human mind. Thus, according to Geertz, we must postulate an adaptive complementarity between the structure of the human mind and the historically crystallized forms of collective mentation that mediate our access to extramental reality and which reside in extrasomatic systems of significant symbols.[16]

We would suggest that a society's technical knowledge is precisely that aspect of their information pool that facilitates an alteration of the relationship between experience and extramental reality through the mediation of techniques and artifacts. In other words, technologies combine information from the culture pool (as meaning) with material and energy in extramental reality that have been purposefully altered in order to afford novel intentional acts. Technical knowledge is an important aspect of the information pool that changes one or more of the five main properties of interaction between intention and reality (see Ihde 1990). Innovative technologies may (1) alter the development of neurognosis (e.g., technology may alter diet which may affect the course of somatic growth), (2) alter the obduracy of material reality and open up new affordances (e.g., afford subsistence possibilities and change the obdurate nature of climate; open up new ways of sensing the environment), (3) alter the range of feed-forward testing of cultural models (e.g., invention of the telescope made the heavens much more complex and open to testing of knowledge about planetary and stellar relations), (4) alter what is hidden and what is perceivable (e.g., the microscope revealed the nature of pathogens that previously were hidden from our senses and only imagined), and (5) alter our experience of the Other (e.g., electronic media allow communication between geographically separated family members).

It is perhaps the alteration of obduracy and affordancy where technological changes display their most dramatic impact upon culture and experience (e.g., see Laughlin 1997a, b, 2000 for the impact of cyborg technologies on human consciousness and culture). As we have seen, it is the interaction between the experiencing individual and extramental reality that defines the nature of obduracy and affordancy. A broad, swiftly flowing river may at the same time impede a cross-country trek and afford nourishment in the form of fresh water and fish. But if a society knows how to construct a bridge or a raft, the obduracy of the river changes, as does the possibilities of transportation the river now affords. Following Geertz's reasoning, it is the state of obduracy and affordancy in the interaction between experiencing individuals and extramental reality that defines the challenges of adaptation for a people.

The Gap in the Age of Neuroscience

It should be evident by now that the experience of a mind–body gap is one that is mediated by a somatic system that produces a systematic error in our knowl-

edge of reality. It should also be quite obvious that any account of the mind–body, experience–reality gap that is not informed from modern neuroscience is historically outmoded and will inevitably fall into empirical error. The ethnographic evidence alone suggests that the application of appropriate technologies—even relatively primitive technologies—to the question of the relationship between mind and body have been quite productive. In point of fact, trying to solve the mind–body problem with no reference to neurophysiology is to overlook a growing and substantive field of knowledge directly concerning our distinctly human ways of being-in-the-world. Moreover, there is now an increasing awareness that combining trained phenomenology with neuroscientific research is not only possible, but it is also smart and extremely productive (Laughlin et al. 1990; Thompson and Varela 2001; Jack and Roepstorff 2002; Fuster 2003:249; Lutz and Thompson 2003; Noë and Thompson 2004; Clegg 2006; Thompson 2006; Wallace 2006; Lutz et al. 2007; Vogeley and Kupke 2007).

■

CONCLUSIONS

We have been discussing the interaction between experience and extramental reality with specific reference to "the gap" between experience and reality hypothesized by certain schools of philosophy. Most of us would agree that the world of our experience is different in certain respects than the extramental reality of which we are a part. We often recognize that our senses provide only partial information about objects and events in our environment, and our understanding of our universe is limited by the structures of our nervous system. Indeed, the evidence pertaining to cultural cosmologies around the globe suggests that virtually all peoples recognize this distinction—hence, among other things, their focus upon the "hidden" causes behind daily events. That said, the struggle to comprehend the relationship between our consciousness and reality, even the reality of ourselves, has led to controversy and debate for centuries. We have suggested that the best, and perhaps only scientifically tenable route to a solution of the experience–reality "gap" is by way of an anthropologically informed cultural neurophenomenology.

We have shown that some of the more outlandish solutions to the problem of "the gap" generated by Western philosophers are not reflected in the cultural cosmologies and ethno-logics of peoples around the globe. Despite the fact that there exist phenomenological roots for "the gap"—as demonstrated by our exploration into the phenomenology of grasping—we have shown that cultures around the planet tend to account for the relationship between experience and reality by engaging, acknowledging and providing interpretive information pertaining to at least five basic existential properties of that relationship—namely,

inherent knowing, obduracy–affordancy, the trueing of expectations, the often hidden nature of causation, and the innate properties of intersubjectivity. What we have argued is that all people everywhere are confronted by at least these five properties in interaction with the world, and that daily engagement with these properties tends to engender the realization of an interactive realism within such cosmologies. These encounters provide the phenomenological foundations for knowledge about "the gap," while modern neuroscience is now able to shed considerable light upon the neurophysiological mechanisms involved in the processes of interaction.

Yet, as all human experience consists of both sensory input from the world and meaning interjected from memory, the role of cultural information in providing understanding is crucial. Culture, defined here as a system of socially available information, predisposes people to understand their encounter with reality in distinct ways. Yet, because the cultural information pool is necessarily entangled with individual experience in a feed-forward/feedback system, personalization experiences of obduracy and affordancy of an ever-changing reality will lead to individualized appropriations of such forms of cultural information. Given the right circumstances, such personalized understandings may potentiate changes in the information pool. This is especially so with respect to technological innovations that may fundamentally alter the obduracy and affordancy of reality. Thus, we can see that there is actually no distinct "gap" at all between experience and reality, for in truth the relationship is one of interaction, interpenetration and, to some extent at least, codependency. Finally, as modern neuroscience represents the most advanced technologies yet invented for examining the gap, contemporary phenomenological and anthropological accounts of consciousness–reality relations will need to be increasingly cognizant of the importance of examining relevant research from neuroscience.

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NOTES

1. He is co-author of *Biogenetic Structuralism* (1974), *The Spectrum of Ritual* (1979) and *Brain, Symbol and Experience* (1990), all from Columbia University Press. He has done ethnographic fieldwork among the So of Northeastern Uganda, Tibetan lamas in Nepal and India, Chinese Buddhists in Southeast Asia, and the Navajo people of the American Southwest.
2. He is author of the forthcoming book *Suffering and Sentiment: Exploring the Vicissitudes of Experience and Pain in Yap*. Berkeley: University of California Press.
3. We use the term *cultural cosmology* here to distinguish the kind of worldview held by peoples around the world from the current use of the term *cosmology* by astro-

physicists and other physical scientists. A cultural cosmology is a worldview that permeates every aspect of daily life, whereas scientific cosmology has little or no influence on people's daily lives, even the lives of scientific cosmologists (see Laughlin 1994).

4. A recent book by Stephen Reyna (2002) argued very persuasively for combining hermeneutical anthropology and the neurosciences, something our group has been advocating steadily for over 30 years (see Laughlin and d'Aquili 1974; Laughlin 1988, 1996; Laughlin et al. 1990).

5. Scientifically useful phenomenology requires the skills of what we have elsewhere called "mature contemplation" (see Laughlin et al. 1990:24–33). A phenomenologist who has practiced to the point where he or she may lay aside their "natural attitude" has (among other realizations) dropped any belief in a permanent ego and is able to discriminate between essential structures and variant contents of perception. These individuals are capable of extended and intense concentration upon elements of experience required to actually attain the state of consciousness Husserl called the "phenomenological reduction." There is as much difference in skill between a mature contemplative and a naive phenomenologist of the "as I gaze out of my study window and contemplate the oak tree in the back yard" sort as there is between a back yard stargazer and a Ph.D. astronomer.

6. This exercise continues the work the authors have undertaken developing a cultural neurophenomenology of experience (Throop 2002, 2003b), including experiences had during alternative states of consciousness (Laughlin and Throop 2006), of variance and invariance in cultural cosmologies (Laughlin and Throop 2001), of truth and the process of trueing (Laughlin and Throop 2007), of emotion (Laughlin and Throop 1999), and of Durkheim's notion of "collective effervescence" (Throop and Laughlin 2002). Our development of a cultural neurophenomenology is an outgrowth of biogenetic structural theory—a perspective that fosters the integration of anthropology and the neurosciences into a neuroanthropology (see Laughlin and d'Aquili 1974; Laughlin et al. 1990).

7. Some years ago, Laughlin and his students ran a holocultural survey using the standard sample of cultures and found that virtually all cultures for which there are data evidence at least minimal mind–body duality (Laughlin 1993, 1997a).

8. Laughlin's granddaughter Larkin did this exercise when she was 8 years old and after puzzling over it for a while, exclaimed, "It's magic!"

9. We have gone into the phenomenology of grasping as a special case in the phenomenology of the body elsewhere; see Laughlin and Throop (2007).

10. This view actually harkens back to Uexkull's (1909) notion of Umwelt.

11. Few people are avid philosophers or seriously question their cultural point of view. Indeed, ethnographer Paul Radin argued decades ago that most people in any society are "men of action" while a small percentage (if any) are philosophers (see Radin 1927).

12. For example, Leder argues that our "cultural belief in the disassociation of mind and body leads to an increase in disassociative practices; we are encouraged to abandon sensorimotor awareness for abstracted mathematical or linguistic forms. This in turn intensifies the day-to-day experience of mind as disembodied, confirming the initial cultural premise" (1990:152–53).

13. We are using the term *pragmatism* in its broadest sense meaning that people tend to value knowledge of a practical nature—knowledge that is connected with the facts of events. We do not wish to imply any particular school of philosophical pragmatism, be it that of Pierce, James, or Dewey.

14. This is a common pattern cross-culturally; see for example Rappaport (1984) for the Tsimbaga belief in witches dwelling in mountainous areas infested with tsetse flies.

15. Laughlin found in his field research among the So of Northeastern Uganda that over 80 percent of the hundreds of plants for which the So have names are used for medical and other purposes (see Laughlin and Allgeier 1979).

16. It is interesting to note here how strongly some of Geertz' ideas on the extra somatic nature of significant symbols and artifacts seem to resonate with Wilhelm Dilthey's writings on "objectified mind" (see Throop 2002).

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