JOHN R. BAKER

Psychedelics, Culture, and Consciousness: Insights from the Biocultural Perspective

INTRODUCTION

The contributions in this volume attest to both our extraordinary human abilities to voluntarily enter into altered states of consciousness and to the sophisticated conceptual frameworks that people draw upon to comprehend these states. Although certainly not exhaustive, these papers demonstrate that a wide variety of techniques for inducing altered states of consciousness have been developed in both traditional and modern contexts. They also make it clear that these states can vary both in terms of the experiences they are associated with and the ways that these experiences are interpreted and understood.

In this paper, I will employ a biocultural perspective as I discuss a methodology for altering consciousness that is different from all of the others presented at this symposium: the ingestion of psychedelic substances. The use of psychedelics may be more ancient than all of the other techniques for altering consciousness discussed in this volume. Yet in spite of the widespread use of these substances across cultures and throughout time, cultural training and individual variation continue to play as great a role in shaping their effects and outcomes as they do in the meditative and contemplative traditions. What is more, the fact that profound altered states of consciousness can be spontaneously induced through exogenous agents as well as through long periods of training makes the study of psychedelics very useful for discerning the roles that cultural expectations and individual characteristics play in shaping the experiences of an altered state and the ways in which these experiences will be understood. Moreover, since psychedelic substances are almost "guaranteed" to produce effects in even naïve individuals, they can help us to understand the constructive potential that altered states of consciousness may have for a much wider population than just

those persons who are both motivated and privileged enough to study and practice meditation and other similar techniques.

THE BIOCULTURAL PERSPECTIVE

The biocultural perspective is an emerging anthropological paradigm that aims at developing a more comprehensive framework for understanding human life by incorporating biological insights into explanations of sociocultural phenomena. While biological scientists are able to draw upon the robust explanatory framework provided by neo-Darwinian evolutionary theory when investigating such topics as intraspecies cooperation and interspecies competition, researchers who investigate such cultural phenomena as politics or warfare do not yet have an equally well-articulated and integrated view of their phenomena at their disposal. Biological insights offer a way out of this theoretical impasse.

As in the other social and behavioral sciences, many of the theories developed within anthropology have downplayed or even denied the role that biological factors play in human social life. This tendency has its roots in the Enlightenment, when such thinkers as John Locke argued that the mind of a newborn infant was like an "empty cabinet" which his or her culture then filled with knowledge (Harris 1968:10-16). To be sure, there were great differences in opinions as to what kind of "wood" this empty cabinet may have been made off (contrast the rather pessimistic perspective that Thomas Hobbes offered on human nature with the more romanticized view of Jean Jacques Rousseau). This "enlightened" thinking led to numerous nineteenth century ideas based upon the general notion of social "progress," which were framed (whether implicitly or explicitly) in ways that provided justification for the imperial, colonial, and missionary activities of the European powers. The focus on the influences that social and technological complexity, religious beliefs, and even geographical latitude and climate could have on human life represent an early emphasis on "nurture" (as opposed to "nature") that overlooked the very real biological differences between individuals. This trend found perhaps its most extreme example in the recent postmodern movement, whose proponents frequently complain that efforts to identify the biological bases of human life represent an

attempt to assert the "hegemony" of science over other, equally legitimate "narratives" about the human condition (cf. McKinley 2000).[1]

However, ignoring our biology can make it well nigh impossible to comprehend even quite simple aspects of human life, such as why different people have different dietary requirements, or why some people are more sensitive to sunlight than others. When looking at consciousness, leaving biology out of the picture can make it difficult to understand why one person can more readily attain a particular state of consciousness than another, or why changing our mental state may affect our breathing, digestion, and body temperature. Because the biocultural perspective considers both the biological mechanisms and processes that make human consciousness possible and the cultural techniques and explanatory frameworks that are used to produce and understand any particular consciousness state, it offers a comprehensive and powerful paradigm for understanding the effects of different techniques for altering consciousness.

Two biological facts about humans are especially pertinent to the present discussion: 1) modern humans are descended from animals that possessed smaller and simpler brains; and 2) humans differ from one another with respect to numerous micro-features of our brains and nervous systems. Although these facts may appear to be so basic as to be trite, they have important implications for the present discussion. In vertebrates, the brain is the integrative center for almost all nervous system functions. As vertebrates evolved, their brains acquired increasingly powerful abilities to not only control their bodies, but also to retain memories of past events, learn from present experiences, and contemplate ever more complex scenarios about the future. The diversity found in the vertebrate subphylum today bears witness to the stages in which vertebrate brains—and their associated abilities—evolved. Simple vertebrates, such as the fish and amphibians, possess quite limited mental abilities, and consequently exhibit a rather narrow spectrum of behaviors, social groupings, and experiential states. Others, especially the birds and mammals, are capable of a much wider range of behav-

[1] One colleague of mine told me of a conference she had attended in which a shouting match had erupted between supporters of postmodernist thinking and proponents of a more empirical view. When one empiricist attempted to introduce genetic evidence in support of his argument, his appalled opponent shouted out "You don't really believe in genes, do you?"

iors, social groups, and experiential states (see Griffin 2001 for a more detailed discussion).

The ultimate expression of this trend, of course, is the human brain, which has also acquired the ability to communicate what it has learned to others. In addition to the macroevolutionary processes that have made humans distinct from all other animals, the microevolutionary processes of random mutation and selection, and the process of individual development, make each of us distinct from one another. As a result, every human possesses a somewhat different constellation of mental qualities, resulting in disparate degrees and types of intelligences. Because states of consciousness are directly linked to brain functioning, this implies that each of us varies in terms of our abilities to learn about and enter into altered states of consciousness.

THE DYNAMIC NATURE OF CONSCIOUSNESS

Although we commonly speak of "states" of consciousness, this choice of terms glosses over the ever-changing nature of conscious experience (cf. Zinberg 1977). Mammalian consciousness shifts between three primary modalities, each of which in turn consists of a wide range of experiential states: the waking state, REM sleep, and deep sleep. Put simply, the mammalian waking state is the modality in which animals are able to actively engage their external world, while REM sleep and deep sleep allow animals to recover from their exertions and process their waking experiences.

Within these three primary modalities of consciousness exist countless subtle variations. In the waking state, we may at one moment be alert and focused on the task at hand, while the next moment may find us drowsy and unable to concentrate at all. Even when we are completely awake, our ability to focus our attention varies, as do the objects that engage our awareness. These fluctuations in our mental activity have long been recognized, and some meditative traditions explicitly aim at taming our "monkey mind," the tendency of our attention and awareness to wander (cf. Chodron 1999).

The monkey metaphor raises interesting questions as to how and when our ancestors first became able to voluntarily induce altered states of consciousness and to utilize these for constructive purposes. Even casually observing another animal is sufficient to see that like humans, it too has periods of activity and quiet, and that the objects that may

interest it at one moment will be ignored at another. We can assume that the consciousness of our ancestors, like that of humans and other animals today, was characterized by similarly alternating periods of alertness and drowsiness, focus and lack of focus. As their intelligence and self-awareness increased, our ancestors would have needed to be able to exert some degree of control over these shifts in conscious awareness, for there would have always been those basic "reality checks" that came from the external world, whether in the form of predators that they needed to evade or potential mates that they would have wanted to recognize. The selective pressures coming from the world outside of their bodies would have been unforgiving, and those individuals who could not quickly respond to important events in their external world would have paid with their lives.

Evolutionary fitness is measured by the number of offspring an individual produces, and therewith the number of genes that the individual is able to contribute to the next generation. Clearly, those individuals that were better able to rapidly disengage from the internal worlds of deep and REM sleep and face their external worlds in a reality-based manner (that is, one that would benefit their survival and reproduction) would possess advantages over those that were less capable of doing so. Moreover, as brains increased in size (especially relative to an animal's body size), animals became more capable of both processing the information being provided by their senses and to remember their previous experiences. This led to increases in their abilities to discern the differences between specific events and to envision alternative scenarios about both the causes and the implications of these events. These increases in intelligence, coupled with the development of more complex social groups in which individuals could observe, interact, and learn from one another, eventually led to the emergence of culture (Bonner 1980).

The broad strokes of these evolutionary events are documented in the fossil record, and we know much about the general sequence in which they occurred in our own hominid lineage (see, e.g. Johanson 1996). But are these increases in intelligence and social complexity enough to explain the emergence of the types of consciousness traditions discussed in this volume? This is not likely. For one thing, all known contemporary traditions of consciousness alteration rely upon detailed and nuanced models for describing the effects of the experiences they aim at evoking, and these models are communicated through

language (examples may be found in the other papers in this volume). While we will never be able to fully reconstruct the sequence of evolutionary events that led to the appearance of *Homo sapiens*, the fossil record clearly indicates that modern humans are descended from smaller brained animals that lived in social groups of about 100 individuals or less. With brains no larger than those of a modern chimpanzee, and lacking a system of language like that used by all human groups today, it is safe to assume that the traditions of consciousness alteration described elsewhere in this volume did not—indeed *could* not—exist until our ancestors had acquired not only the anatomical features that make these experiences possible, but had also developed the linguistic abilities that enabled them to describe their experiences to their fellows and to discuss with one another what these experiences meant.

We do not know when our ancestors first acquired the capacity for language as we now know it. In all likelihood, a number of steps were necessary before human language could emerge (see Mithen 1996 for one possible scenario). Lacking language, it would have been impossible to develop the explanatory models found in the meditative traditions discussed in this volume. Without language to teach a person how to achieve a meditative state, it is likely that the first mystical states of consciousness that our ancestors experienced were spontaneous events.

While extreme activity—including excessive physical exertion, hunger and thirst, and sleeplessness—may have elicited these events, there are other possibilities, and these are present in many environments around the world. The number of plants, fungi, minerals, and even animals capable of rapidly inducing profoundly altered states of consciousness is unknown, but it is large (see Rätsch 2005). As our foraging ancestors browsed through their environments in search of food and other resources, they would have occasionally and unavoidably encountered psychoactive agents. As they gained familiarity with their effects, they would have learned that some of these agents could help them to stay awake, others would cause them to fall asleep, and still others were able to induce experiences unlike any they had ever known. It is this latter group of agents that may have served as the catalysts that would eventually lead to the emergence of other techniques for voluntarily altering consciousness.

PSYCHEDELICS AND CONSCIOUSNESS

Of all the naturally occurring psychoactive substances, those with the most profound effects upon consciousness have become known by many names. Lewis Lewin, the German physician regarded as the father of modern toxicology, called them "phantastica" (Lewin 1980[1927]). Some of the other terms that have been put forth include "hallucinogens" (Hoffer et a. 1954), "entheogens" (Ruck 1979), and "psychointegrators" (Winkelman 1995). In the present context, perhaps the most appropriate term is "psychedelic", a term coined in 1956 (Osmund 1957). The word literally means "mind manifesting", and refers to the abilities of such substances as LSD, mescaline, and psilocybin to temporarily suspend our normal perceptual and mental functioning while having little effect upon memory. Visual and other sensory effects are common, and higher dosages can lead to a complete dissolution of an individual's awareness of himself as an individual (producing a sense of "merging"), an inability to distinguish between perceptions arising from inside and outside of the body, and the temporary suspension of normal cognitive and affective interpretations of perceptions.

A wide variety of substances can produce these effects, and the use of these substances has been documented throughout the world (Dobkin de Rios 1984, Furst 1990, Schultes 2001). Depending upon their chemical structure, their mechanisms of action vary considerably. Some naturally occurring psychedelic substances (such as the tropane alkaloids) can produce lethal as well as visionary effects. In spite of such dangers, *Datura*, *Mandragora*, *Atropa*, *Nicotiana*, and other members of the Solanaceae family have been used for shamanic, initiatory, and other ritual purposes since prehistoric times (cf. Baker 1994, Wilbert 1987). The use of such plants reflects both our basic human predilection to enter into altered states and the fact that almost any psychoactive substance can be utilized for personally integrative and culturally constructive purposes when used appropriately.

The use of the more powerful hallucinogens, such as mescaline and psilocybin, is also ancient. Ayahuasca, a preparation made by boiling the stems of the *Banisteriopsis caapi* vine together with the leaves of the *Psychotria viridis* bush, has been used by Amazonian tribes for centuries. The pharmacology of ayahuasca is extraordinary, for substances present in the *caapi* vine (*Banisteriopsis caapi*) inhibit the release of an enzyme—monoamine oxidase—that normally breaks down the substances present in the *chacruna* leaves (*Psychotria viridis*). The

potent visionary effects characteristic of ayahuasca can only be achieved when these two plants are used in combination. When and how the indigenous peoples of South America first learned to combine these two plants is unknown, but its use is now so pervasive in the Amazon basin—and increasingly elsewhere—that ayahuasca may be the most commonly used psychedelic preparation in the world today (for more on the history, pharmacology, and psychology of ayahuasca as well as numerous personal reports, see Metzner 1999).

In contrast to the traditional use of psychedelic substances in non-western cultures, the modern use of psychedelics in the West has often been associated with the idea of "bad trips." One reason is our long-standing cultural attitudes towards altered states of consciousness in general, for of all the world's cultures, those whose roots lie in the eastern Mediterranean basin are the least likely to have institutionalized religious traditions of altering consciousness (Bourguignon 1973). Today's western "hallucinophobic" attitude has a long tradition. The proscriptions against "pagan" religions issued by the Emperor Theodosius in 380 C.E. when he adopted Christianity as the official religion of the empire suppressed such previously accepted practices as the Eleusinian and Dionysian Mysteries (or forced them far underground), and resulted in a loss of knowledge concerning the proper ways to use psychedelic substances.

During the next sixteen hundred years or so, most European knowledge about the proper ways to use these substances and exploit their effects for constructive purposes was lost. Consequently, few were prepared for the rediscovery of the psychedelic substances that began in the nineteenth century and accelerated in the twentieth, especially after the discovery of LSD in the 1940s. Many of the first experiments in which chemists and other researchers ingested LSD and psilocybin produced such unanticipated effects that it was thought that these substances produced a kind of transitory psychotic state (Stoll 1947). The "psychotomimetic" and "toxic psychosis" models that were developed to explain these effects led some clinic and hospital administrators to urge their physicians, nurses, and other attending staff to have experiences with these compounds so that they could gain temporary access into the worlds that their patients were thought to inhabit on a more or less permanent basis. It was thought that this would enable these health care workers to better understand their patients and to develop more effective methods for treating them. But many of these "normal" people

noticed that their experiences were completely different from those of their patients, and it quickly became clear that new models were needed (see Grob 1994 for a more detailed discussion).

Humphry Osmond, the British psychiatrist who coined the term "psychedelic", used LSD to treat psychiatric patients who did not respond to more conventional treatment methods. He and his colleagues administered extremely high doses (usually once) in order to evoke experiences that would literally overwhelm their patients and lead them to reassess their lives (Osmond 1957). This treatment method, which aimed at essentially bypassing repressed traumatic events and eliciting a religious "conversion" experience, worked especially well with alcoholics and other patients with rigid personality structures (see also Sherwood 1967-68).

In contrast to this largely North American methodology, much of the clinical work performed in Europe followed a protocol in which a series of low to medium dosages of a psychedelic agent were administered in conjunction with psychoanalysis and group work. This "psycholytic" (literally: "mind dissolving") approach aimed at peeling back the layers of personality and memory as if they were an onion, allowing repressed material to emerge into conscious awareness at a pace and tempo that could be tolerated by patients. This treatment strategy allowed patients to uncover, understand, and accept the traumatic events of their past, and gave researchers unanticipated insights into the dynamics of the mind (Sandison 1954a; Sandison 1954b; Grof 1976).

In addition to these clinical studies, psychedelic substances were also given to artists and other persons to assess the impact they might have on creativity (Dobkin de Rios 2003). As increasing numbers of people were being exposed to psychedelics, it was only a matter of time before they would "escape" from the laboratory and make their way to the streets, where millions of individuals were ultimately able to take their own psychedelic "trips". By the early 1960s, the settings in which psychedelics were used varied enormously, ranging from individual and small group sessions in natural settings or at home to large scale gatherings at parties and concerts. Lacking any traditional contexts for using these substances, some people were unprepared for the personal and transpersonal insights that accompanied the spectacular visual and other sensory effects, and they experienced "bad trips". Others suffered physical injury because they were temporarily unable to react appropriately to external events. Yet for many people, the inner worlds revealed by

these substances were mysterious and beautiful, and they offered a stark contrast to the images of violence and destruction that were coming back from Vietnam and to the crass consumerism and the push for conformity that were the legacies of the return to normalcy after World War II. For many in this group, the vistas revealed by psychedelics suggested alternative ways of living that were quickly perceived as threats to the existing social order. The psychedelic insights expressed in the lyrics to the Beatles' song "All You Need is Love" were matched by hyperbole from more conservative quarters. For example, C.W. Sandiman, who was then serving as the chairman of the New Jersey Narcotic Drug Study Commission, described LSD as "the greatest threat facing the [United States] today, … more dangerous than the Vietnam War" (cited in McGlothlin 1967:42).

Laws were quickly passed that prohibited the manufacturing, distribution, use, or possession of psychedelic substances. By the mid-1960s, all legitimate scientific research using psychedelics on human patients had been curtailed. In spite of a large body of research suggesting that psychedelic experiences can be beneficial for personal and spiritual growth (e.g., Pahnke 1972, Smith 2000, Winkelman 2007), most people in the West continue to view psychedelics in a highly negative light. Clearly, the influence of cultural attitudes about altered states remains powerful.

CULTURAL CONTEXTS: SACRAMENTS VS. SACRAMENTALS

If we recall the role that culture plays in such mundane aspects of human life as what types of things can be eaten or when a person may engage in sexual activities, it should not be surprising that cultures also have something to say about what states of consciousness are allowed and what these states mean. The cultural context in which psychedelics are used is one of the most important variables for understanding their effects. To distinguish between the use of psychedelics in societies that permit and even encourage their use from the use that occurs in societies in which such use is proscribed, it is useful to differentiate psychedelic "sacraments" from psychedelic "sacramentals" (Baker 2005).

In spite of their profound effects upon consciousness, the "major" psychedelic agents (psilocybin, mescaline, LSD, ayahuasca) have few adverse effects upon a person's physical health. Indeed, unless a person has serious psychological issues, the most dangerous aspect of

psychedelic use has to do with the possibility of a person harming themselves while he or she is unable to perceive or understand the outside world, and with the potential legal consequences that can result from the possession and use of these substances. In contrast, traditional societies both respect these substances and provide supervision for novices, both to prevent harm and to help them deal with any issues that may arise while they are in an altered state. In such societies, the first use of a psychedelic substance often has an initiatory quality, and experienced users coach novices about the types of experiences they should expect. Armed with a detailed "map" of the worlds they will be entering, convinced of the significance of their experiences, and supervised while they are in the altered state, a novice's fears can be allayed and positive outcomes become more likely.

In societies which have little or no understanding of psychedelic substances, or which view them with fear and suspicion, psychedelic use tends to occur clandestinely, and users typically have no guides. As they explore their new worlds, they must find their own way through the tangle of their visions, thoughts, and emotions. The emergence of repressed memories or a vision of an unexpected nature may evoke terror in a user, and any issues that are not resolved during the acute phases of the psychedelic experience may emerge later as a "flash back." In spite of these possibilities, many people in such societies have experiences that provide personal insights that they interpret as beneficial (cf. Stolaroff 1999).

When the use of a psychedelic substance occurs in an accepting and supportive context that promotes the importance of the experiences for both the individual and society, we may refer to such use as a "sacrament." Thus, both the ancient mysteries of Demeter that were carried out for centuries at Eleusis (Wasson 1998) and the contemporary use of peyote among both the Huichol Indians of Mexico (Myerhoff 1974) and the members of the Native American Church (Stewart 1987) may be considered to be psychedelic sacraments. They are sacraments because they occur in culturally sanctioned ritual settings, and novice users are provided with a shared cultural framework that enables them to anticipate what they will experience and to understand their experiences once they have passed. Under such conditions, the use of psychedelic substances is considered beneficial and aids in integrating the individual into their society.

In contrast, the use of psychedelic substances in societies which prohibit their use can lead a person to question that society's value system if he or she has an experience different from that which they have been taught to expect. Any rituals or interpretational models that may surround such use will tend to be either personal in nature or be shared by only a small group of individuals. Although the individual may find their experiences beneficial, the larger cultural context will not agree. Under such conditions, idiosyncratic interpretations of psychedelic experiences are common, and these interpretations may not lead to greater social cohesion. It is for these reasons that I have used the term "sacramental" to distinguish these contexts of use from their more traditional and accepting counterparts (Baker 2005).

The western emphasis upon individual development—often at the expense of other members of the group—stands in stark contrast to the emphasis traditional societies place upon integrating the individual within the group. In and of themselves, psychedelic agents do not promote anti-social attitudes. It is the context in which they are used that determines whether the experiences may lead to social cohesion or fragmentation. A society that can accurately describe and teach its members to safely navigate through the visionary worlds revealed by psychedelics will minimize the possibility that these members will resort to "counter"- (or even "anti"-) social interpretations for these experiences. A society that tells its members that these experiences are illusory or have no meaning risks having its members question its other values as well.

THE UNIQUE NATURE OF ALL ALTERED STATES OF CONSCIOUSNESS

The "sacrament"/"sacramental" distinction underscores the role that cultural expectations play in shaping the experiences and interpretation of an altered state. The idea that some people are more susceptible to "bad trips" because of repressed traumas or other personal, biographical factors points to the role that may be played by individual psychological differences. Moreover, it is likely that basic genetic (and thus molecular) differences between individuals also play a role in determining sensitivity to psychedelic substances. For example, the effects of LSD are known to be at least partially related to a specific type of serotonin receptor site known as 5-HT_{5a} (Grailhe 1999), and the gene which codes for this protein is polymorphic in humans (i.e., it has more than one

expression). Studies have been conducted into the role that this genetic variation may play in schizophrenia (Iwata 2001) and in major depression and bipolar disorders (Arias 2001), but the results have been equivocal. Yet just as psychedelic substances exhibit affinities to specific receptor sites, it is likely that structural differences in those receptors may affect the uptake of these substances and therewith the extent to which their effects will be elicited.

My aim here is not to provide an overview of the physiological mechanisms involved in psychedelic activity, but to point out that the variation which humans exhibit at the molecular level is also likely to shape the experiences elicited by psychedelic agents. Thus, the unavoidable genetic and psychological uniqueness of each individual suggests that the experiences a person has while in a psychedelic state will always be somewhat different than those of another individual, even when the same psychedelic substance is being used at the same time in the same cultural context. The American anthropologist Anthony F.C. Wallace has described culture as a system that organizes the diversity of human views of reality (Wallace 2003). Thus, in traditional societies, the preparatory phase in which novices learn to interpret and anticipate their experiences will help to channel their experiences into similar courses, yet there will always be some individual idiosyncrasies in these experiences. But in societies that do not provide such preparation, an individual's experiences while in a psychedelic state are much more likely to diverge from those of her fellows, and idiosyncratic interpretations are far more likely as well.

Moreover, since each psychedelic substance has its own unique chemical structure, each of these substances will affect the nervous system in a different way and elicit a unique state of consciousness. The constant changes in the neural "wiring" in an individual as well as the role of experience also suggest that no two psychedelic states of consciousness can ever be identical. Even in the same person, prior experience (or lack thereof) will shape the ways in which a psychedelic session unfolds. Although we speak of consciousness "states", in reality consciousness is fluid.

THE IMPLICATIONS OF PSYCHEDELICS FOR UNDERSTANDING MEDITATION AND YOGIC PERCEPTION

Although this paper has focused on the use of psychedelics, I believe that the points it raises apply to consciousness in general, and to meditation and yogic perception in particular. All organisms must be able to pay some attention to the world around them, and their ability (or inability) to do so has been a potent evolutionary selective force. Yet normal mammalian functioning also depends upon an animal being able to periodically withdraw from the outer world, both to restore the body and to process mental events. Meditative techniques represent a new and uniquely human way of withdrawing from the outer world. While meditative traditions differ in terms of the techniques they utilize and the ways in which they are interpreted and understood, all involve shifts in consciousness away from the normal ways in which humans interact with the external world.

As with psychedelic substances, cultural training and personal histories will affect an individual's abilities to enter into and learn from meditative experiences. This fact has been recognized by many meditative traditions and conceptualized in manners consonant with the other assumptions of the cultures in which they arose. According to the Hindu and Buddhist traditions that are the primary focus of this volume, for example, it may take many lifetimes for an individual to overcome their negative karma and achieve a birth that is conducive to attaining moksha or nirvana. This negative karma is said to be the result of past thoughts and actions. What such traditions have not considered—at least as far as I am aware—is the role that what we now call genetic factors may play in shaping a person's mood, intelligence, or memory.

What makes the study of psychedelics particularly interesting in the context of this volume is that they explicitly remind us of the role that even small-scale molecular processes can play in the large-scale picture of human consciousness. It is for this reason that I am arguing that a comprehensive understanding of any type of methodology for altering consciousness must consider not only the cultural assumptions associated with that methodology, but also the insights offered by biology. In other words, consciousness is a product of processes that occur from the "bottom up" as well as the "top down." Understanding consciousness requires that we look at both.

Psychedelic substances also provide us with another important lesson. Unlike most meditative and contemplative traditions, which

demand that practitioners devote extended periods to learning and gradually refining their abilities, the effects of psychedelic agents are rapid in their onset and almost impossible to overlook. Psychedelics offer a short-term "break" from normal reality that a person can easily work into their schedule. Consequently, they have the potential to "democratize" consciousness by making it possible for large numbers of people to explore the worlds that exist within them and to examine and refine their conceptions and attitudes about the world. How helpful it would be if our cultures would provide us with both an accepted means and an accurate map for exploring these worlds.

BIBLIOGRAPHY

Arias 2007 — B. Arias, D.A. Collier, C. Gasto, L. Pintor, B. Gutierrez, V. Valles and L. Fananas, "Genetic variation in the 5-HT[5A] receptor gene in patients with bipolar disorder and major depression," *Neuroscience Letters*, 303(2):111-114 (accessed on 30.6.2009 at http://cat.inist.fr/?aModele=afficheN&cpsidt=952198).

Baker 1994 — J. R. Baker, The Old Woman and Her Gifts: Pharmacological Bases of the Chumash Use of *Datura*, *Curare* 1994 17(2):253-276.

Baker 2005 — J. R. Baker, Psychedelic Sacraments, *Journal of Psychoactive Drugs*, 2005, 37(2):179-187.

Bonner 1980 — J. T. Bonner, *The Evolution of Culture in Animals*, Princeton, New Jersey, 1980.

Bourguignon 1973 — E. Bourguignon, Introduction: A Framework for the Comparative Study of Altered States of Consciousness, *Religion, Altered States of Consciousness, and Social Change*, ed. By E. Bourguignon, Columbus, Ohio, 1973, 3-35.

Chodron 1999 — T. Chodron, *Taming the Monkey Mind*. Berkeley, CA. 1999.

Dobkin de Rios 1984 — M. Dobkin de Rios, *Hallucinogens: Cross-Cultural Perspectives*, Albuquerque, New Mexico, 1984.

Dobkin De Rios 2003 — M. Dobkin and O. Janiger, *LSD, Spirituality, and the Creative Process*, Rochester, Vermont, 2003.

Furst 1990 — P. T. Furst, *Flesh of the Gods: The Ritual Use of Hallucinogens*, Prospect Heights, Illinois, 1990.

Grailhe 1999 — R. Grailhe, C. Waeber, S. C. Dulawa, J. P. Hornung, X. Zhuang, D. Brunner, M. A. Geyer, and R. Hen, Increased Exploratory Activity and Altered Response to LSD in Mice lacking the 5-HT(5A) Receptor, *Neuron*, 1999, 22(3):581-91.

Griffin 2001 — D. R. Griffin, *Animal Minds: Beyond Cognition to Consciousness*, Chicago, revised and expanded edition 2001.

Grob 1994 — C. S. Grob, Psychiatric Research with Hallucinogens: What Have We Learned? *Yearbook for Ethnomedicine and the Study of Consciousness*, 1994, 3:91-112.

Grof 1976 — S. Grof, *Realms of the Human Unconscious: Observations from LSD Research*, New York, 1976.

Harris 1968 — Harris, M., *The Rise of Anthropological Theory: A History of Theories of Culture*, New York, 1968.

Hoffer 1954 — A. Hoffer, H. Osmond, and J. Smythies, Schizophrenia: A New Approach. II. Results of a Year's Research, Journal of Mental Science, 1954, 100(418):29-45.

Iwata 2001 — N. Iwata, N. Ozadi, T. Inada and D. Goldman, An Association of a 5-HT5a Receptor Polymorphism, pro15ser, to Schizophrenia, *Molecular Psychiatry*, 2001, 6:121 (accessed on 30.6.2007 at http://www.nature.com/mp/journal/v6/n2/pdf/4000870a.pdf).

Johanson 1996 — D. Johanson and B. Edgar, *From Lucy to Language*, New York, 1996.

Lewin 1980 — L. Lewin, *Phantastica: die betäubenden und erregenden Genussmittel*, second, expanded edition 1980 (reprint of the 1927 edition).

McGlothlin 1967 — W. H. McGlothlin, Toward a Rational View of Hallucinogenic Drugs, *Journal of Psychedelic Drugs*, 1967 1:40-52.

McKinley 2000 — B. McKinley, Report on Last Spring's Science and Anthropology Session, *CSAS Bulletin Central States Anthropological Society*, 2000, 36(1):12-16.

Metzner 1999 — R. Metzner (ed.), *Ayahuasca: Human Consciousness and the Spirits of Nature*, New York, New York 1999.

Mithen 1996 — S. Mithen, *The Prehistory of the Mind: A Search for the Origins of Art, Religion and Science*, London, 1996.

Myerhoff 1974 — B. Myerhoff, *The Peyote Hunt: The Religious Pilgrimage of the Huichol Indians*, Ithaca, New York, 1974.

Osmund 1957 — H. Osmund, A Review of the Clinical Effects of Psychotomimetic Agents, *Annals of the New York Academy of Sciences* 1957 (reprinted in David Solomon (ed.), *LSD: The Consciousness-Expanding Drug*, 1966, New York: G.P. Putnam's Sons, pp. 132-154).

Pahnke 1972 — W. N. Pahnke and W. A. Richards, Implications of LSD and Experimental Mysticism, *Journal of Religion and Health*, 1966, 5:175-208 (reprinted in Charles T. Tart (ed.), *Altered States of Consciousness*, Garden City, New York: Anchor, pp. 409-439).

Rätsch 2005 — C. Rätsch, *The Encyclopedia of Psychoactive Plants*, Rochester, Vermont, 2005.

Ruck 1979 — C. A. P. Ruck, J. Bigwood, D. Staples, J. Ott, and R. G. Wasson, Entheogens, *Journal of Psychedelic Drugs*, 1979, 11(1-2):145-6.

Sandison 1954a — R. A. Sandison, Psychological Aspects of the LSD Treatment of the Neuroses, *Journal of Mental Science*, 1954, 100:491-507.

Sandison 1954b — R. A. Sandison, A. M. Spencer and J. D. A. Whitelaw, The Therapeutic Value of Lysergic Acid Diethylamide in Mental Illness, *Journal of Mental Science*, 1954, 100:491-507.

Schultes 2001 — R. E. Schultes, A. Hofmann, and C. Rätsch, *Plants of the Gods: Their Sacred, Healing, and Hallucinogenic Powers*, Rochester, Vermont, 2001

Sherwood 1967-68 — J. N. Sherwood, M. J. Stolaroff and W. W. Harman, The Psychedelic Experience – A New Concept in Psychotherapy, *Journal of Psychedelic Drugs*, 1967-68, 1:96-111 (originally published in *Journal of Neuropsychiatry*, 1962).

Smith 2000 — H. Smith, *Cleansing the Doors of Perception: The Religious Significance of Entheogenic Plants and Chemicals*, New York, 2000.

Stewart 1987 — O. C. Stewart, *Peyote Religion: A History*, Norman, Oklahoma, 1987.

Stolaroff 1999 — M. J. Stolaroff, Are Psychedelics Useful in the Practice of Buddhism? *Journal of Humanistic Psychology*, 1999, 39(1):60-80.

Stoll 1947 — W. A. Stoll, Lysergsäure-diäthylamid, ein Phantastikum aus der Mutterkorngruppe, *Schweizer Archiv für Neurologie und Psychiatrie*, 1947, 60:279-323.

Wallace 2003 — A. F. C. Wallace, *Revitalizations & Mazeways: Essays on Culture Change, Volume 1*, edited by Robert S. Grumet, Lincoln, Nebraska, 2003.

Wasson 1998 — R. G. Wasson, A. Hofmann and C. A. P. Ruck, *The Road to Eleusis: Unveiling the Secret of the Mysteries*, Twentieth Anniversary Edition, Los Angeles, 1998.

Wilbert 1987 — J. Wilbert, *Tobacco and Shamanism in South America*, New Haven, Connecticut, 1987.

Winkelman 1995 — M. Winkelman, Psychointegrator Plants: Their Roles in Human Culture, Consciousness and Health, *Yearbook of Cross-Cultural Medicine and Psychotherapy 1995, Theme Issue: Sacred Plants, Consciousness, and Healing. Cross-Cultural and Interdisciplinary Perspectives*, M. Winkelman and W. Andritzky (eds.), pp. 9-53, Berlin, 1995.

Winkelman 2007 — M. J. Winkelman and T. B. Roberts, *Psychedelic Medicine: New Evidence for Hallucinogenic Substances as Treatments,* Westport, Connecticut, 2007.

Zinberg 1977 — N. E. Zinberg ed., *Alternate States of Consciousness*, New York, 1977.